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Determinants of Stock Market Returns in Nigeria: A Time Series Analysis

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Determinants of Stock Market Returns in Nigeria: A Time Series Analysis[‡]

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Abstract

It is a known fact that the market liquidity is an important attribute of stock market development. Liquid markets essentially improve the mobilization and allocation of capital and thereby enhance the prospects of facility long-term growth. This argument stems the objective of this study in analyzing the determinants of stock market returns in Nigeria using the OLS method based on the sourced time series variables from the Central Bank of Nigeria (CBN) between 1984 and 2010. The findings indicated that interest rate, previous stock return levels, money supply and exchange rate are the main determinants of stock returns in Nigeria. Therefore, this study proffer the need to adopt a mixed policy approach between capital and monetary market instruments in order to enhance the returns in the Nigerian Stock Exchange.

Keywords: Capital Market, Stock Price, Macroeconomic indicators, OLS, Nigeria

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I. Introduction

Over the past years, Nigerian economy has been subjected to series of social, political and economic policies and reforms. Before a decade after independence, the country was basically agrarian and the various regional governments then largely achieved food security. In 1961, the establishment of the Nigerian Stock Exchange (formally called Lagos Stock Exchange) promoted private capital investment for growth and development in order to develop the capital market[§]. Past and present scholars believed that investment that promotes economic growth and development requires long term funding, far longer than the duration for which most savers are willing to commit their funds. In the capital market, both local and foreign investors provide long-term funds in exchange for long-term financial assets offered by fund users. Ologunde (2006) said that the market embrace both the new issues (primary) market and secondary market. Generally, capital markets are the heart beat of every economy since their ability to respond instantaneously to fundamental problems change in all countries. Also, it encourages savings and real investment in any healthy economic environment. Aggregate savings are channeled into real investment which increases capital stock and therefore economic growth of the country. These attributes of capital market make it possible for the discerning minds to feed the impulse of such an economy. Nigeria Stock Exchange is not an exemption as it is expected to be influenced by external shocks, which are outside the realm of capital market. The external shocks are the macroeconomic indicators that are expected to cause variation in the stock prices movement. Maku and Atanda (2009) argued that these changes are often reflected by the magnitude and movement in stock prices, market index and liquidity of the market.

Nonetheless, it is a known fact that the market liquidity is an important attribute of stock market development. Liquid markets essentially improve the mobilization and allocation of capital and thereby enhance the prospects of facility long-term growth. Indeed since liquidity enables investors to adjust quickly and with minimal costs, it makes investments less risky (Omole, 1999.) The recent financial crisis has made the Nigerian capital market illiquid and this has caused the downward trend in the market. In turn, the capital is becoming less attractive to long-term investors and very risky to invest. The perceived risks associated with investing in Nigeria market are high. As a result of the risk, foreign investors are patronizing other emerging markets even before the recent global financial meltdown. Nigeria is the most hit market among other capital markets in Africa like Johannesburg Stock Exchange (JSE) and Ghana Stock Exchange (GSE) because of its lost in market capitalization during this global financial crises that have engulfed many economies of the world. The NSE capitalization has dropped by over N8.1 trillion from its peak of N13 trillion in 2008 when the financial turmoil started spreading to emerging economies in the world, to the figure of N4.9trillion, which it closed at the end of 2009 (Business Day, 2009).

In the last three decades, interactions between capital market and macroeconomic variables have been an issue among financial economists and practitioners (Omole, 1999; Christopher Minsoo, Huahwa and Jun, 2006; Ikoku, 2007 and Maku and Atanda, 2009). They argued that stock prices are determined by some fundamental macroeconomic variables such as the interest rate, gross domestic product (GDP), exchange rate, inflation and money supply. Empirical evidences from the financial press

[§] Capital market is a collection of financial institutions set up for the granting of medium and long-term loans. It is a market for government securities, for corporate bonds, for the mobilization and utilization of long-term funds for development – the long-term end of the financial system. Thus, it is a mechanism whereby economic unit desirous to invest their surplus funds, interact directly or through financial intermediaries with those who wish to procure funds for the business.

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indicate that investors generally believe that monetary policy and macroeconomic events have a large influence on the volatility of the stock price. Christopher et al (2006) opined that macroeconomic variables can influence inventors' investment decision and motivates many researchers to investigate the relationships between share returns and macroeconomic variable. Favorable macroeconomic policies are expected to impact positively on market and vice versa; which might be instantaneous, lagged or even anticipatory. Central authorities set macroeconomic performance targets every fiscal year and these targets are usually tied to two principal macro policy frameworks (fiscal and monetary). The regulatory agencies in the Nigeria have instituted numerous policies to stabilize the macroeconomic variables which had little impact on the Nigerian capital market. They are expected to interact to ensure that government achieves its macroeconomic goals of general increase in output growth, promoting price stability, stable exchange rate, employment growth etc. The key macroeconomic indicators are: GDP, inflation rate, interact rate (both Treasury bill and lending rate), money supply and exchange rate are not the only determinant of stock prices movement. Other factors (non-macroeconomic variables) that affect the stock prices and the general trend of the market are seasonal variation, enlightment of the investment public or general awareness of the market, political and social crisis, investment motive, random behavior of investors, new listing of securities, individual investor's objective in the market (speculation or long-term investment), company's earnings release and activities of the market regulator.

The current financial crisis and the capital market sensitiveness to external shock resulting from the global financial meltdown have affected the performance of the macroeconomic fundamentals in the economy. The Nigerian economy has experienced mixed macroeconomic performance over the years. Similarly, the Nigerian Stock Exchange also have undergone series of reforms to measure up with other emerging markets in the world and increase the influx of foreign investors. Maku and Atanda (2009) argued that it is done to promote the key sectors of the economy, make the market accessible for raising capital and attractive to both foreign and local investors. Following the fact that macroeconomic variables have taken different values over the years alongside the market stock price index, can it be said that there exists any relationship between the key macroeconomic variables and stock market index in Nigeria? On this basis, this research paper investigates the relationship or co-integration between the variable determinants and stock market performance in Nigeria as well as analyzes the force of macroeconomic shocks on her stock market.

The remaining section of this study is divided into four parts. Section two discusses theoretical framework and literature review. Section three depicts the graphical trend analysis of exchange rate instability and macroeconomic variables determinants. Section four highlights the illustrative theoretical model employed to explain the variable determinants of exchange rate volatility in Nigeria. Section five gives the empirical results and discussion of findings and the last section would not only proffer policy recommendations but also conclude the study.

II LITERATURE REVIEW AND THEORETICAL FOUNDATION

2.1 Literature Review

The issue of causality between macroeconomic variables and share returns over the years have stem up controversies among researchers based on varying findings. Theoretically, macroeconomic variable are expected to affect returns on equities. But over the years the observed pattern of the influence of macroeconomic variables (in signs and

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magnitude) on share returns varies from one study to another in different capital markets. Over the years, empirical findings by researchers suggest that there is a significant linkage between external shocks and stock return in the most countries reviewed.

In an elaborate search for the macroeconomic variables that have effect on stock returns, Chen, Roll and Ross (1986) identified interest rate, expected and expected rates of inflation and the spread between high and low-grade bond as the relevant variables. Chen, Roll and Ross (1986) test the multifactor model in the United State of America by employing seven macroeconomic variables. They find that consumption, oil prices and the market index are not priced by the financial market. However, industrial production, changes in risk premium and twists in the yield curve are found to be significant in explaining stock returns. Miller and Modigliani (1961) used a different approach in analyzing the theoretical basis for the pricing of the stock relation to factors that might bring about its fluctuation. Using the dividend model, stock returns are expressed as the discounted value of expected stream of each (dividend) flows. The systematic variables that affect discount factors and cash flows to companies will therefore influence returns. Clare and Thomas (1994) investigate the effect of 18 macroeconomic factors on stock returns in the UK. They find oil price, retail price index, bank lending and corporate default risk to be important risk factors for the United Kingdom stock returns. Mukherjee and Naka (1995) use vector error correction approach to model the relationship between Japanese stock return and macroeconomic variables. Cointegation relation is detected among stock prices and the six macroeconomic variables, namely exchange rate, inflation rate, money supply, money supply, real economic activity, long-term government bond rate and call money rate.

Furthermore, Know and Shin (1999) examines the role of macroeconomic variables in estimating Korean stock prices. Stock indices seem to be cointegrated with the combination with the combination of the four macroeconomic variables namely trade balance, foreign exchange rate, industrial production and money supply. Ibrahim and Aziz (2003) investigate the relationship between stock prices and industrial production, money supply, consumer price index, and exchange rate in Malayasia. Stock prices are found to share positive long-term relationships with industrial production and CPI. One the contrary, he found that stock prices have a negative association with money supply and (Ringgist) exchange rate. Serkan Yilmaz (2008) investigates the role of macroeconomic factors in explaining Turkish stock returns. He employed macroeconomic factor model from the period of July 1997 to June 2005. The macroeconomic variables consider are growth rate of industrial production index, change in consumer price index, growth rate of narrowly defined money supply, change in exchange rate, interest rate, growth rate of international crude oil prices and return on the MSCI World Equity Index. He found that exchange rate, interest rate and world market return seem to affect all of the portfolio returns, while inflation rate is significant for only three of the twelve portfolios. Also, industrial production, money supply and oil prices do not appear to have significant effect on stock returns in Turkey. Kyereboah, Anthony and Agyire (2008) examined how macroeconomic indicators affect the performance of Ghana stock market using quarterly time series data covering the period of 19991to 2005. They found that lending rates from deposit money banks have an adverse effect on stock market performance and particularly serve as major hindrance to business growth in Ghana. Inflation rate was found to have a negative effect on stock market performance.

Nevertheless, attempt has been made by Nigerian researchers to investigate the relationship been macroeconomic variables and stock prices. Soyode (1993) made an attempt to test the association

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between stock prices and macroeconomic variables as exchange rate, inflation and interest rate. He found that the macro economic variables are cointegrated with stock prices are consequently related to stock returns. Amadi, Oneyema and Odubo (2000) employed multiple regression to estimate the functional relationship between money supply, inflation, interest rate, exchange rate and stock prices. There study revealed that the relationship between stock prices and the macroeconomic variables are consistent with theoretical postulation and empirical findings in some countries. Though, they found that the relationship between stock prices and inflation does not agree with some other works done outside Nigeria. Nwokoma (2002), attempts to establish a long-run relationship between the stock market and some of macroeconomic indicators. His result shows that only industrial production and level of interest rates, as represented by the 3-month commercial bank deposit rate have a long-run relationship with the stock market. He also found that the Nigeria market responds more to its past prices than changes in the macroeconomic variables in the short run. Ologunde, Elumilade and Asaolu (2006) examine the relationships between stock market capitalization rate and interest rate. They found that prevailing interest rate exerts positive influence on stock market capitalization rate. They also found that government development stock rate exerts negative influence on stock market capitalization rate and prevailing interest rate exerts negative influence on government development stock rate. Maku and Atanda (2009) examined the long-run and short-run macroeconomic shocks effect on the Nigerian capital market between 1984 and 2007. They examined the properties of the time series variables using the Augmented Dickey-Fuller (ADF) test and Error Correction Model (ECM). However, the empirical analysis showed that the NSE all share index is more responsive to changes in exchange rate, inflation rate, money supply and real output. Therefore, all the incorporated variables that serve as proxies for external shock and other macroeconomic indicators have simultaneous significant impact on the Nigerian capital market both in the short and long-run.

2.2 Theoretical Foundation

Financial Economic Theory

One way of linking macroeconomics variables and stock market returns is through arbitrage pricing (APT) (Ross, 1976), where multiple risk factors can explain asset returns. While early empirical papers on APT focused on individual security returns, it may also be used in an aggregate stock market framework, where a change in a given macroeconomic variable could be seen as reflecting a change in an underlying systemic risk factor influencing future returns. Most of the empirical studies on APT theory, linking the state of the macro-economy to stock market returns, are characterized by modeling a short run relationship between macroeconomic variables and the stock price in terms of first difference, assuming trend stationarity. An alternative, but not inconsistent approach is the discounted cash flow or present value model (PVM). This model relates the stock price to future expected cash flows and the discount rate of these cash flows. Again, all macroeconomic factors that influence future expected cash flow or the discount rate by which these cash flows are discounted should have an influence on the stock price. The advantage of the PVM model is that it can be used to focus on the long run relationship between the stock market and macroeconomic variables. Campbell and Shiller (1988) the relationship between stock prices, earnings and expected dividends. They find that a long term moving average of earnings estimate predict dividends and the ratio of this earning variables to current stock price is powerful in predicting stock returns over several years. They conclude that these

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facts make stock prices and returns much too volatile to accord with a simple present value model.

Stock Prices Behaviour: Divergent Views

There are five schools of thought on stock price behaviour. These are the fundamentalist schools, the technical school, the random walk hypothesis school, the Bahavioural School of finance and macro-economic hypothesis school. The fundamentalist believe that the value of a corporation's stock is determined by expectations regarding future earnings and by the rate at which those earnings are discounted. The fundamentalists apply present value principles to the valuation of corporate stock, using dividends, earnings, assets and interest rate to establish the price of stock.

The technical school opposes the fundamentalists' arguments, and claims that stock price behaviour can be predicted by the use of financial or economic data. They submit that stock prices tend to follow definite pattern and each price is influenced by preceding prices, and that successive prices depend on each other. According to Smith (1990), technical analysts engage themselves in studying changes in market prices, the volume of trading and investors' attitude.

Both the "technical" and "fundamental" analyses have been challenged by scholars who subscribe to the random-walk hypothesis, which sees stock price movements in terms of a probability distribution of different possible outcome. The random-walk hypothesis is based on efficient market assumption that investors adjust security rapidly to reflect the effect of new information. Believers in the efficient capital market hypothesis argue that stock prices are essentially random and therefore, there is no chance for profitable speculation in the stock market. An interesting feature of random walk is the persistence of random shocks. Empirical test of the random-walk hypothesis have been carried out by scholars like Moore (1962) and Fama (1965). These scholars independently tested the statistical randomness of successive changes in stock prices. Their findings showed insignificant departures from randomness and were both inconclusive and insufficient.

The behavioural school of finance holds that market might fail to reflect economic fundamentals under three conditions. When all three apply, the theory predicts that pricing biases in financial markets can be both significant and persistent. The first behavioural condition is irrational behaviour. It holds that investors behave irrationally when they don't correctly process all the available information while forming their expectations of a company's future performance. The second is systematic patterns of behaviour, which hold that even if individual investors decided to buy or sell without consulting economic fundamentals, the impact on share prices would be limited. Lastly, limits to arbitrage in financial markets ascertain that when investors assume that a company's recent strong performance alone is an indication of future performance; they may start bidding for shares and drive up the price. Some investors might expect a company that surprises the market in one quarter to go on exceeding expectations (Business Day, 2009).

The usual method of using factor analysis approach to determine the factors affecting asset returns, some scholars have measured macroeconomic factors to explain stock return Sweeney and Warga (1986) found that changes in interest rate are associated with risk premia. They interpreted the observation to be a reflection of 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). The macroeconomic approach attempts to examine the sensitivity of stock prices to changes in macroeconomic variables. The approach posits that stock prices are influenced by changes in money supply, interest rate, inflation and other macroeconomic indicators. It employs a general equilibrium approach, stressing the interrelations

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between sectors as central to the understanding of the persistence and co-movement of macroeconomic time series, based on the economic logic, which suggests that everything does depend on everything else.

III Trend Analysis of Macroeconomic Indicators and Market Shares Index in Nigeria

The trend analysis that shows the interaction between macroeconomic indicators and Nigerian Stock Exchange (NSE) all share index is presented in this sub-section. The time series plot of the incorporated macroeconomic indicators and NSE all share index are presented in figure 1 to 4.

The secondary data used in the trend analysis of the interaction between set of macroeconomic variables and the Nigerian Stock Exchange all share index as a proxy of stock market performance are sourced from the Central Bank Statistical Bulletin and Nigerian Stock Exchange Factbook of several issues. The time series data sourced are Nigerian Stock Exchange (NSE) all share index (NSEDX) as measure of stock market volatility in this study, while the incorporated set of macroeconomic indicators sourced are exchange rate of naira to a dollar (EXC), consumer price index as measure of inflation rate (CPI), interest rate (INT), broad money supply (M2) that indicates the availability of abundant money, and real per capita income (RCPI) that measures the standard of living of the investor.

The time series plot in figure 1 shows the Nigerian Stock Exchange (NSE) all share index trend and revealed that the series moves within a fixed bound between 1984 and 1992, after it started being trendy till 2006. Although, the insignificant falls are witnessed between 2007 and 2010 due to the global financial meltdown that engulfed the Nigerian capital market.

Figure 1: Time series plot of NSE All share index

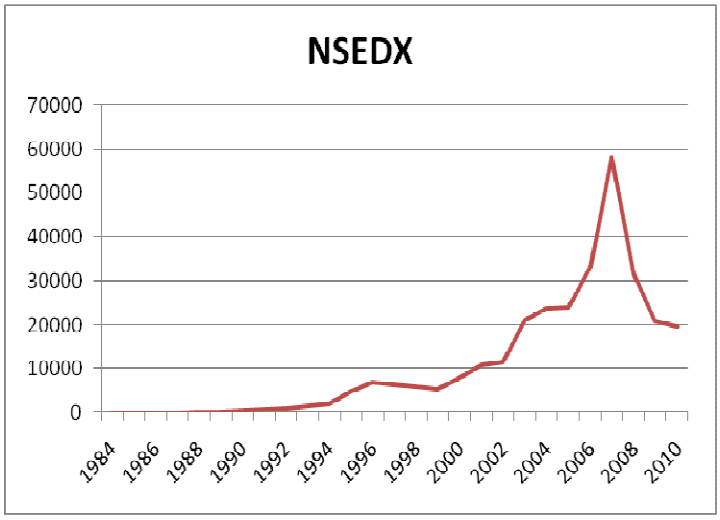

Figure 2: Time series plot of Real Per Capita Income

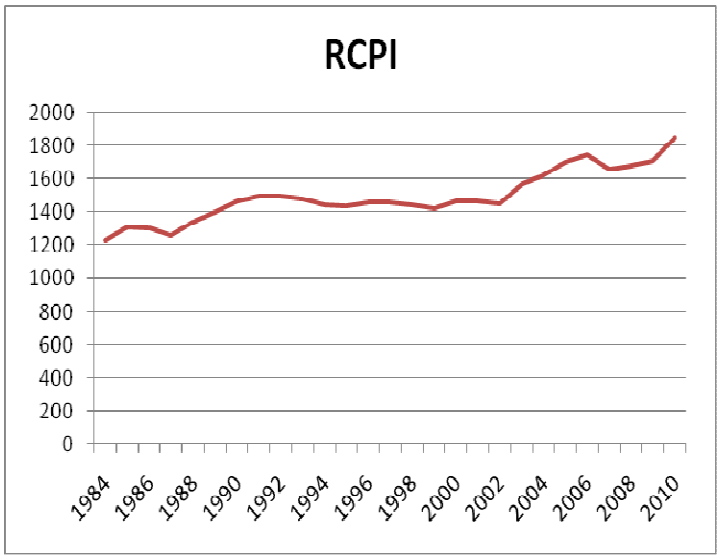

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Figure 3: Time series plot of Broad Money Supply

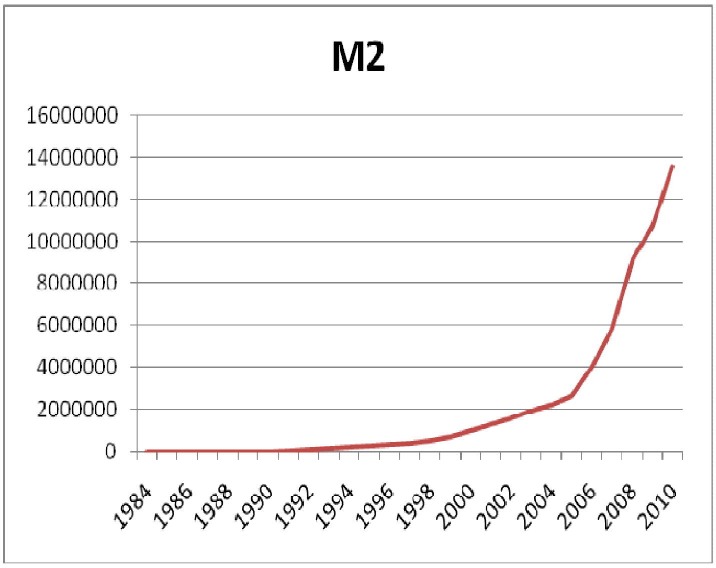
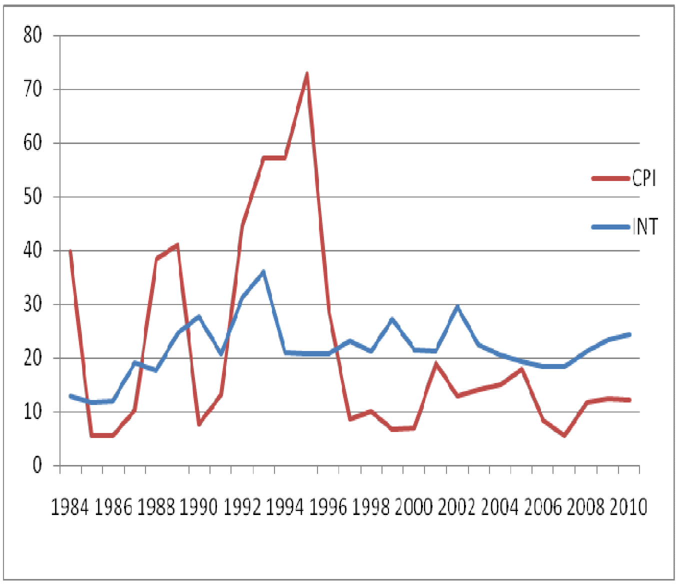


Figure 4: Time series plot of Consumer Price Index and Interest rate



The figure 2 shows that the real per capita income series maintained a consistent pattern over time between 1984 and 2010. While, the broad money supply series presented in figure 3 likewise exhibit the same trend pattern like the NSE all share index series excluding that the series was consistent all through the review. This indicates that even during the global financial crisis, the broad money supply was trendy during the global financial turmoil. However, the figure 4 presented the time series plot of consumer price index that measures the inflationary level in the economy and interest rate series. The figure 4 revealed that the series, consumer price index and interest rate exhibit a random distribution pattern i.e. the series does not maintained consistent trend between 1984 and 2010.

3.0 METHODOLOGY

3.1 Introduction

This section of this study presents the methodological description for the analysis to examine the relationship between stock market performance and its variable determinants in the Nigerian stock market between 1970 and 2010. The time frame is chosen to cover the eras of economic programmes in Nigeria, like the Pre Structural Adjustment Programme (SAP), Structural Adjustment Programme (SAP), Post-Structural Adjustment Programme (Post-SAP). In order, to achieve the research objective precisely, this section of the study focused on the model description of the methodology employed for detailed econometric analysis.

3.2 Model Specification

In examining the precise impact of variable determinants on stock performance in the Nigerian stock exchange market, the empirical model employed by Maku and Atanda (2009) is adopted and modified to achieve the specific objectives of the study. The econometric model employed by Maku and Atanda (2009) in analyzing the shock effect of macroeconomic indicators on the Nigerian Capital market is expressed as:

$$LNSEDX_t = \eta_0 + \eta_1 LEXC_t + \eta_2 LCPI_t + \eta_3 LTBR_t + \eta_4 LM2_t + \eta_5 LRGDP_t + u_t \quad \text{..........(1)}$$

In their work, they proxy Nigerian stock market as NSE all share index and macroeconomic variables are proxy as exchange rate (EXR),

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consumer price index (PCI), treasury bill rate (TBR), broad money supply (M2) and real Gross Domestic Product (GDP). Therefore, the econometric model employed by Maku and Atanda (2009) is adopted and modified by changing treasury bill rate to lending rate which is the most significant money market rate, and while real Per Capita Income (PCI) is incorporated rather than real gross domestic product. Therefore, the econometric model that incorporates the relationship between macroeconomic indicators and stock market returns in Nigeria for this study based on the adopted model[**] is specified as:

$$LNSEDX_t = \beta_0 + \beta_1 LEXC_t + \beta_2 CPI_t + \beta_3 INT_t + \beta_4 M2g_t + \beta_5 RPCIg_t + u_t \quad \ldots (2)$$

Where: LNSEDX = Log of NSE all share index;

LEXC= log of Official Exchange rate (#1=$)

CPI= percentage change in Consumer Price Index i.e. inflation rate.

INT= Interest Rate i.e. Lending rate

M_2g= Annual growth rate of Broad money supply

RPCIg= Annual growth rate of Real Per capita income

$ß_0$= Intercept

$ß_{1-5}$= 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 (2).

The specification of the model is to establish the relationship between stock prices, which invariably contains full information about the entire stock market operating environment and some key macroeconomic variables. The inclusion of these variables derives from the literature on other stock markets (Chen, Roll and Ross, 1986).

The inclusion of exchange rate, interest rate (lending rate), money supply, and GDP per capita are supported by the observed relationship between these variables and stock prices in Nigeria (Omole, 1999). There is yet to be a theoretical consensus on their signs (Chen, Roll and Ross, 1986).

3.3 "A Priori" Expectation

The apriori expectation provides expected signs and significance of the values of the coefficient of the parameters under review on the part of the empirical evidence.

In Nigeria, the level of money supply has been on the increase over the years, implying that since money supply has negative relationship with interest rates, then stock prices would be expected to grow with the level of money supply. Also, interest rates and inflation are expected to have a negative impact on stock prices, and a positive relationship is expected between real GDP per capita income and stock prices.

A depreciating Naira exchange rate is expected to increase stock prices as noted by Amadi *et al* (2000).

3.5 Econometric Method, Nature and Sources of Data

The specified linear regression model is estimated using the ordinary least square (OLS) method. The study made use of secondary data. The data were sourced from the Statistical Bulletin of the Central Bank of Nigeria (CBN), Annual Abstracts of Statistics of the National Bureau of statistics (NBS) and the Nigeria Stock Exchange (NSE) fact book.

[**] Prior to the adapted model specification, several iterations were carried based on number of lags, autoregressive terms and variables transformation in order to have a structurally stable model. The results of the regression iterations were reported at the Appendix for comparison.

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4.0 EMPIRICAL ANALYSIS

4.1 Introduction

This section deals with the econometric analysis of the macroeconomic determinants of the performance of the stock market in Nigeria between 1984 and 2010. The time frame covers the inception of Nigerian Stock Exchange (NSE) All-Share index computation in Nigeria which measures market volatility, through the period the capital market witnessed massive deteriorating down fall due to the global financial crisis that started in the United State as a result of the sub-prime mortgage crisis.

This section also covers presentation of data, estimation and interpretation of the specified empirical model through the use of E-Views 7.1.

4.2 Empirical Results

The result obtained from the estimation output of E-View 7.1 for the empirical model at its transformed variables form[††] is presented in table 4.2.

The specified model formulated to capture the effect of macroeconomic indicators-exchange rate, per capita income, and interest rate-on stock market return is expressed as:

$$LNSEDX_t = \beta_0 + \beta_1 LEXC_t + \beta_2 CPI_t + \beta_3 INT_t + \beta_4 M2g_t + \beta_5 RPCIg_t + u_t$$

The estimated model based on the result presented in table 4.2 is given as:

$$LNSEDX_t = 5.398 + 1.263 LEXC_t + 0.003 CPI_t - 0.066 INT_t - 0.001 M2g_t - 0.029 RPCIg_t$$

The estimated result for the multiple parameters regression specified to capture the effect of macroeconomic shocks on the stock exchange proxy as the NSE all share index in Nigeria between 1984 and 2010 presented in table 4.2 revealed the effect of incorporated macroeconomic factors for the analysis of the study. The table 4.2 reports that changes in exchange rate (LEXC), and consumer price index (CPI) exert positive effects on stock market performance in Nigeria between the inception of NSE all share index computation and 2010 fiscal year and all of these effects conform with the theoretical expectations excluding the effect of inflation rate which is expected to exert negative effect on changes in NSE all share index based on sign.

In terms of magnitude of effect, a unit increase change in exchange rate of naira vis-à-vis U.S dollar (LEXC) and percentage increase in changes in consumer price index (CPI) will enhance the performance of the Nigerian Stock Exchange (NSE) by 1.2627 basis points and 0.003% respectively.

Also, other incorporated determinants of stock market performance, interest rate (INT), growth of broad money supply (M2g) and real per capita income (RPCIg) growth rate were found to retard the performance of Nigerian stock market between 1984 and 2010. None of these are in tandem with the apriori expectations excluding money market interest rate. When the money market interest rate guarantees higher returns this will increase the demand for money market instruments and caused downward pressure on the changes in NSE all share index. The result further revealed that percentage change in prime lending rate, money in circulation, and real per capita income, the Nigerian All Share Index as a measure of stock market performance decline by 0.066%, 0.001% and 0.029% respectively.

In assessing the partial significance of the estimated parameters for the incorporated macroeconomic indicators, the t-statistics results are presented in the table 4.2. The result shows that the estimated parameter for changes in exchange rate (LEXC) and interest rate (INT) were found to be partially statistically significant at 5% critical level because their *p-values* are less than 0.05. While, the

[††] Prior to the adapted model specification, several iterations were carried based on number of lags, autoregressive terms and variables transformation in order to have a structurally stable model. The results of the regression iterations were reported at the Appendix for comparison.

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estimated parameters for the consumer price index (CPI), broad money supply growth rate (M2g) and real per capita income (RPCIg) growth rate were found partially insignificant at both 5% and 10% critical level.

Although, the F-statistic result shows that all the set of macroeconomic indicators that posed shocks-(i.e. the log of exchange rate (LEXC), consumer price index (CPI), interest rate (INT), broad money supply (M2g) growth rate and real per capita income (RPCIg) growth rate)-incorporated are simultaneously significant at 5% critical level. While, the adjusted R-squared result reveals that 91% of the total variation in the Nigerian Stock Exchange (NSE) all share index as a measure of stock performance is accounted by changes in exchange rate (LEXC), consumer price index (CPI), interest rate (INT), broad money supply (M2g) growth rate and real per capita income (RPCIg) growth rate during the review period. The Durbin-Watson test result reveals that there is presence of positive serial correlation among the residuals, because of the d-value (0.986391) is far from zero but close to two.

Table 4.2: Estimated Regression Result

Dependent Variable: LNSEDX				
Method: Least Squares				
Sample: 1984 2010				
Included observations: 26				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	5.397837	0.529137	10.20122	0.0000
LEXC	1.262703	0.085457	14.77591	0.0000
CPI	0.003004	0.006944	0.432585	0.6699
INT	-0.065855	0.026677	-2.468618	0.0227
M2g	-0.001298	0.006453	-0.201220	0.8426
RPCIg	-0.028870	0.034079	-0.847165	0.4069
R-squared	0.925241	**F-statistic**		49.50506
Adjusted R-squared	0.906551	**Prob(F-statistic)**		0.000000
Durbin-Watson stat	0.986391	**S.E. of regression**		0.577690

Source: Extracted from the appendix

5.0 Conclusion and Recommendation

5.1 Conclusion

Emanating from the research findings, it can be deduced that external shock and other macroeconomic variables dictates the movement of stock market prices performance and volatility, and some of these key variables are the significant determinants of the stock market performance in Nigeria during the reviewed period. Specifically, the changes in exchange rate of naira vis-à-vis U.s dollar (LEXC) and interest rate (INT) were found to exert significant impact on the growth of the Nigerian Stock Exchange all share index between 1984 and 2010.

On the basis of the F-Statistic result, this study rejects the null hypothesis "stock market performance has no significant relationship with its determinant variables in the Nigerian stock market" at 5% significance. Therefore, concludes that specific external shocks and macroeconomic indicators are significant determinants of stock

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market performance in Nigeria. However, the precise link or causality between macroeconomic indicators and stock market performance is not yet known from this study and this will serve as a gap to be filled for other future studies on Nigerian stock market. Our econometric evidence is also in line with the findings of scholars reviewed in chapter two like Ologunde et.al (2006); Soyode (1993); Akinifesi (1987), Amadi et al. (2000), and Maku and Atanda (2009).

5.2 Recommendations

The following policy options are recommended to bring about enhanced stock market performance amidst macroeconomic fluctuations and external forces:

i. The government should fine turned the exchange rate policy and institute a consistent policy plan to mobilize surplus funds from abroad, which would be injected into the capital market for significant development.
ii. The standard of living of the citizens as measured by Per Capital Income (PCI) should be increased by providing essential infrastructural community facilities in order to increase the ability of the people to invest in the Nigerian capital market.
iii. It is desirable for returns on equities to be inflation hedge. For Nigerian equities to have this property, we recommend full deregulation of the entire price formation process in the capital market.
iv. The government and the securities exchange commission (SEC) should create a special fund called “stabilization securities fund” to stabilize the market in the presence of external shocks. This to make the market attractive to proposed, existing and foreign investors.
v. Considering the level of process of the Nigerian capital market, to external shock the concerned authorities should institute policies and mechanism that will stabilize significant macroeconomic indicators in order to promote the capital market.

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RESULT APPENDIX

Estimation at Absolute Level

Dependent Variable: NSEDX				
Method: Least Squares				
Date: 06/06/12 Time: 17:10				
Sample: 1984 2010				
Included observations: 27				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-53336.77	29629.92	-1.800098	0.0862
EXC	105.9363	51.05534	2.074931	0.0505
CPI	-14.09793	99.55487	-0.141610	0.8887
INT	-706.6720	330.6343	-2.137322	0.0445
M2	-0.000438	0.000792	-0.552986	0.5861
RPCI	49.80232	22.61320	2.202356	0.0390
R-squared	0.718160	Mean dependent var		11122.34
Adjusted R-squared	0.651055	S.D. dependent var		13936.55
S.E. of regression	8232.541	Akaike info criterion		21.06271
Sum squared resid	1.42E+09	Schwarz criterion		21.35067
Log likelihood	-278.3465	Hannan-Quinn criter.		21.14833
F-statistic	10.70206	Durbin-Watson stat		1.473541
Prob(F-statistic)	0.000033			

The magnitudes of the coefficients of the explanatory variables are too large due differential measurement of the incorporated variables. Also, the reported standard error of regression is large reflecting presence of multicolinearity and heteroskedasticity. Therefore, the model is structurally not stable to explain the determinants of stock market performance in Nigeria.

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Estimation of Double Log Model

Dependent Variable: LOG(NSEDX)				
Method: Least Squares				
Date: 06/06/12 Time: 17:20				
Sample (adjusted): 1985 2010				
Included observations: 26 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.397837	0.529137	10.20122	0.0000
LOG(EXC)	1.262703	0.085457	14.77591	0.0000
CPI	0.003004	0.006944	0.432585	0.6699
INT	-0.065855	0.026677	-2.468618	0.0227
M2GR	-0.001298	0.006453	-0.201220	0.8426
RPCIG	-0.028870	0.034079	-0.847165	0.4069
R-squared	0.925241	Mean dependent var		8.238580
Adjusted R-squared	0.906551	S.D. dependent var		1.889762
S.E. of regression	0.577690	Akaike info criterion		1.939614
Sum squared resid	6.674506	Schwarz criterion		2.229944
Log likelihood	-19.21499	Hannan-Quinn criter.		2.023219
F-statistic	49.50506	Durbin-Watson stat		0.986391
Prob(F-statistic)	0.000000			

The estimated model reported a low standard error of regression which tends not to influence the level of t-statistics and overestimate the adjusted R^2. This estimated model is preferred to the below reported model because all explanatory variables are estimated at their growth rate level excluding exchange rate which is logged.

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Dependent Variable: LOG(NSEDX)				
Method: Least Squares				
Date: 06/06/12 Time: 17:17				
Sample (adjusted): 1985 2010				
Included observations: 26 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-16.62133	14.34110	-1.159000	0.2601
LOG(EXC)	1.108010	0.129956	8.526044	0.0000
CPI	0.004029	0.006686	0.602598	0.5535
INT	-0.057121	0.026112	-2.187559	0.0407
M2GR	-0.002960	0.006350	-0.466088	0.6462
LOG(RPCI)	3.054283	1.996914	1.529502	0.1418
R-squared	0.930668	Mean dependent var		8.238580
Adjusted R-squared	0.913335	S.D. dependent var		1.889762
S.E. of regression	0.556326	Akaike info criterion		1.864251
Sum squared resid	6.189982	Schwarz criterion		2.154581
Log likelihood	-18.23527	Hannan-Quinn criter.		1.947856
F-statistic	53.69320	Durbin-Watson stat		0.835148
Prob(F-statistic)	0.000000			

Autoregressive Models

Dependent Variable: LOG(NSEDX)				
Method: Least Squares				
Date: 06/06/12 Time: 17:07				
Sample (adjusted): 1985 2010				
Included observations: 26 after adjustments				
Convergence achieved after 23 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.97115	16.03832	1.120513	0.2765
LOG(EXC)	-0.122905	0.227825	-0.539472	0.5958
LOG(CPI)	-0.029871	0.085816	-0.348076	0.7316
LOG(INT)	-0.427998	0.315964	-1.354576	0.1914
LOG(M2)	0.300094	0.485200	0.618496	0.5436
LOG(RPCI)	-1.346856	1.888495	-0.713190	0.4844
AR(1)	0.915899	0.063971	14.31737	0.0000
R-squared	0.981137	Mean dependent var		8.238580
Adjusted R-squared	0.975181	S.D. dependent var		1.889762
S.E. of regression	0.297715	Akaike info criterion		0.639444
Sum squared resid	1.684050	Schwarz criterion		0.978162
Log likelihood	-1.312770	Hannan-Quinn criter.		0.736982
F-statistic	164.7143	Durbin-Watson stat		1.695188
Prob(F-statistic)	0.000000			
Inverted AR Roots	.92			
Dependent Variable: LOG(NSEDX)				
Method: Least Squares				
Date: 06/06/12 Time: 17:08				

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Sample (adjusted): 1986 2010				
Included observations: 25 after adjustments				
Convergence achieved after 21 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.23502	15.71757	0.778430	0.4470
LOG(EXC)	-0.101907	0.252364	-0.403809	0.6914
LOG(CPI)	-0.100046	0.108870	-0.918946	0.3710
LOG(INT)	-0.427283	0.320447	-1.333396	0.2000
LOG(M2)	0.420152	0.527865	0.795947	0.4370
LOG(RPCI)	-0.894860	2.037656	-0.439161	0.6661
AR(1)	1.057685	0.250479	4.222648	0.0006
AR(2)	-0.170534	0.240718	-0.708439	0.4883
R-squared	0.980383	Mean dependent var		8.374261
Adjusted R-squared	0.972305	S.D. dependent var		1.794829
S.E. of regression	0.298691	Akaike info criterion		0.675520
Sum squared resid	1.516673	Schwarz criterion		1.065560
Log likelihood	-0.444002	Hannan-Quinn criter.		0.783701
F-statistic	121.3702	Durbin-Watson stat		2.035454
Prob(F-statistic)	0.000000			
Inverted AR Roots	.86	.20		

The autoregressive models [AR(1)] and [AR(2)] were found to report low standard errors of regression and have inverted AR root within the unit modulus. This implies that the autoregressive models are structurally stable but none of the incorporated determinants were found significant which might be a result of the presence of inconsistent variances over time i.e. heteroskedasticity that caused the low standard error.

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