

## **Effects of Macroeconomic Variables on StockMarket Returns in Nigeria (1986-2016)**

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**Abstract:** *This study examines the effect of macroeconomic variables on stock market returns in Nigeria for the period 1986 to 2016 sourcing data from the Central Bank of Nigeria Statistical Bulletin, and from the International Monetary Fund (IMF) 2016 data. Stock market returns (STR) derived from the Nigerian stock Exchange (NSE) All Share Index (ASI) represent the dependent variable, while Money supply (M2), Inflation (INF), Exchange rate (EXC), Interest rate (INT), and Market capitalization (MC) represent the independent variables. Employing Autoregressive Distributed Lag (ARDL) bound testing and cointegration techniques, the results of the study show that while M2 has a weak negative and statistically significant effect on STR both in the short run, and in the long run, INF, EXC, and INT, each has a positive but statistically insignificant effect. However, MC has a positive and statistically significant effect. Hence, the study concludes that macroeconomic variables can be used to predict the stock market performance in the NSE. The study recommends enhancement of transparent management to attract more capital from investors, improve the circulation of available information and check against the buy and hold attitude for speculative purposes while enabling INT to play its proper role in the stock market.*

**Keywords:** *Exchange Rate, Inflation, Interest Rate, Market Capitalization, Money Supply, Stock Market Returns.*

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### **I. Introduction**

Experts in the field of economics and finance in various countries have in the past three decades examined the effect of macroeconomic variables on stock returns employing different methods and at times similar methods, using different proxies/similar proxies and different time scope. The curiosity to do this stemmed from the fact that evidences emerged to show that there is a link between some macroeconomic factors and stock market returns. It is asserted that economic news on these macroeconomic variables causes movement in the stock prices and invariably in the stock market returns. This assertion actually gained attention precisely in 1986 when [1] used some macroeconomic factors namely short term and long term interest rates, expected and unexpected inflation rate and industrial production growth to explain stock returns in the US stock market and found a positive relationship. In a similar vein, [2] examined if a similar relationship between macroeconomic variables and stock return exist in Japanese market and his findings were consistent with those of the US market, with only industrial production showing a negative relationship.

However, In England, [3] studied the United Kingdom market and found no such relationship existed in the United Kingdom market as they do in the US. Since then, it has been popular both within and out of Nigeria to study the relationship between macroeconomic variables and stock returns, and the results have been mixed.

The Nigerian economy has huge potentials and that temporally placed Nigeria as Africa's largest economy as of 2014 and the world's 20<sup>th</sup> largest economy as of 2015 [4]. An economy of such enormous potentials can only thrive under a vibrant capital market of which stock exchange is a key section. In the opinions of [5] and [6], Capital market is a mechanism whereby economic units desirous to invest their funds interact directly with financial intermediaries and those who wish to procure funds for their business. The funds are raised and procured as securities in the form of equity, debentures and bonds.

In the work of [7], they posit that stock markets facilitate economic growth by enhancing liquidity and providing funds for industrialization and economic development. They further assert that stock markets also act as interesting investment centres.

On his part, [8] stressed the importance of the stock market to the development of a country and linked it to the effectiveness, governance, and the appropriate regulatory framework designed by both policy makers and politicians. In general, Stock exchanges are set up as a platform for raising long term capital to mitigate the problem of capital constrain, which is even more crucial in developing countries [9].

The Nigerian stock market as any other emerging market presents an exciting challenge for international finance and foreign investment - possessing some peculiarities different from the developed markets. According to [10], they have the potential for remarkably high returns, while simultaneously harbouring substantial risks. This goes to affirm studies by Bilson, Brailsford and [11] and concurs previous studies carried out by [12] and a host of others in the 1990s that Emerging markets have higher risk and returns than developed markets. This unique characteristic of the emerging markets, the Nigerian stock exchange inclusive, has attracted foreign investment from savvy investors and has equally not gone unnoticed by the academic world.

Prior to the 1980s, little was known about the emerging markets due to the high cost barriers to entry. International investment levels were low. Due to this, reforms were carried out in the 1980s and in the early 1990s in China, Latin America, Russia, and in Nigeria. As a result of the reforms, emerging markets now constitute formidable investment alternative to international investors. As part of the reforms in Nigeria for instance, in order to encourage foreign investment into Nigeria thereby enhance the stock market, the government abolished legislation preventing the flow of foreign capital into the country. This allowed foreign brokers to enlist as dealers on the Nigerian Stock Exchange, and investors of any nationality became free to invest. According to [13] the internationalization of the NSE in 1995 following the regulation of the capital market in 1993 and abrogation of laws that restrained foreign participation has attracted participation of a vast number of foreigners both as investors and as operators. The significance of this lies in the fact that more Foreign Direct investment (FDI) and other forms of capital flow boost the NSE and position it for economic growth and economic development

The various reforms and policies that took place and continue to be put in place since 1986 contributed to the turn-around of the economy which led Nigeria to temporarily overtake South Africa as the largest economy in Africa in [14].

Just like an electromagnet, which becomes magnetised when current is switched on, the stock market is at the centre especially when the macroeconomic variables are performing as expected; the Stock Market pulls savings from the nooks and cranny to its centre and releases same to deficit and priority units for fruitful utilization and promising reasonable returns to the stock holders. In this respect, the stock market plays a crucial role in the economic growth and development of a nation by raising funds thereby enhancing liquidity and providing capital for industrialization and economic growth and development especially in the event of effective governance, appropriate policy, regulatory and supervisory framework.

Unfortunately some factors have bedevilled the stock exchange in Nigeria. The fore problems being unfriendly and inconsistent macro-economic policy/ regulatory environment, lack of transparency in economic management, absence of venture capitalists, buy and hold attitude of an average Nigerian, insufficient public sensitization leading to poor public perception of the importance of Sock Exchange. Secondly, stock is one of the most sensitive assets to economic condition and aggressive change in stock prices can have negative implications for an economy [15]. It becomes necessary therefore, to carry out a study like this one within the stipulated scope so that at the end of the day we can proffer solutions by way of recommendations that may lead to the much desired stability of the market.

The main objective of this study therefore is to examine the effect of macroeconomic variables on the Nigerian Stock Exchange returns from 1986 to 2016. Specifically, the study is to examine the effect of Money supply (M2) represented by M2/GDP, ascertain the effect of exchange rate, evaluate the effect of inflation, examine the effect of interest rate, and to examine the effect of market capitalization (MC) each on stock market returns respectively in the Nigerian stock exchange spanning 1986 to 2016. The rest of this paper is divided as follows; section II review of related literature, section III is methodology, section IV is presentation of data and analysis of results, and section V is summary of findings, conclusion, and recommendations.

## **II. Literature Review**

### **2.1 Conceptual and Theoretical Literature**

#### **2.1.1 Conceptual Literature**

The conceptual framework of this study led to the understanding of the effect of macroeconomic variables on stock returns in Nigeria and lends credence to a study by [16] who posited that Stock markets and economic activity of a country are interlinked as economic factors have a significant impact on the performance of stock markets. In this regard, the framework of the study emphasized the effect of percentage changes in money supply, inflation rate, exchange rate, interest rate, market capitalization (independent variables) on stock market returns (dependent variable) derived from Nigerian stock market All Share Index.

### **2.1.1.1 Stock Market Returns**

According to [17], stock market return is the yield an investor obtains over a specified period. It is sometimes used interchangeably with stock prices. In other words, it is the rate of return at the end of maturity of an investment. In this respect, a strong market can be seen as one that incorporates new information on stock prices and hence making the stock prices for the firms stable and accurately valued. Furthermore, literature review reveals that the activities of the stock market determine the direction of the economy - acting sort of as a barometer for measuring the state of the economy. A vibrant stock market ensures a vibrant economy. Stock market returns have predictive power for investment and output because stock market returns are a forward-looking variable that incorporates expectations about future cash flows and discount rates. They serve as indices to investors or governments in making their investment decisions. According to [15], movement in the index from where stock returns are derived indicates performance trend. Investors of different financial capacity are able to invest in the stock market as long as they are able to get a return that is higher than their cost of capital. Stock returns determine how effective and efficient the stock market allocates shares and equities based on preference and availability of market information. In s study by [18] they opined that an increase or a decrease in price of stock creates uncertainty for the investors and in turn affect the demand and supply of stocks. Shares and stock markets are extremely sensitive to any prize-shaping information, relevant for future trends and market.

This explains why the stability of the macroeconomic variables that the slightest news about them have direct ramification on the stock market becomes of utmost importance.

### **2.1.1.2 Money supply (M2) and Stock Market Returns**

Money supply here is represented by broad money supply, generally denoted by M2 (broad money) and connotes the total money supply in the Nigerian economy. Logic demands that an increase in money supply would invariably bring about an increase in liquidity in the economy and subsequently lead to an increase in the purchasing power of the Nigerian citizens. This logic is embedded in the portfolio theory which says that a positive relationship exists between money supply and stock prices, [19]; [20]. There are two things that actually happen that we expect should trigger a positive relationship between money supply and stock market returns. First, more money is available for consumption, and secondly, for investment. More investment, all things being equal, implies more returns. As noted before, more returns also means more attraction for further investment, thus, a vibrant stock market. However, early studies conducted showed that money supply is negatively related to stock returns. This is attributable to the direct relationship between money supply and inflation. Should money supply be such that it triggers inflation, which in turn will push interest rates up, then one should expect a negative relationship between money supply and stock returns as interest rate is negatively related to stock returns. On the basis of these mixed results, it suffices therefore to conduct studies in Nigeria to establish the type of relationship that exists between money supply and stock market returns within the period 1986 to 2016.

### **2.1.1.3 Exchange Rate and Stock Market Returns**

According to the [21], exchange rate specifies the number of units of a given currency that can be purchased with one unit of another currency. The actual exchange rate is determined by the interaction of supply and demand in the foreign exchange market. Such supply and demand conditions are determined by various economic factors (e.g., whether the country's basic balance of payments position is in surplus or deficit). This is specifically true for floating exchange regime. Exchange rates can be fixed at a predetermined level (fixed exchange rate), or they can be flexible to reflect changes in demand (floating exchange rate). Nigeria practices a managed float system of exchange rates. This case is arrangement by which currency prices are allowed to seek their own levels (i.e. in respond to market demand and supply) but with calculated and timely government interventions. Foreign exchange is the instruments used for international payments. Provided the demand for a product is elastic, when the currency of a country depreciates against foreign currencies, export product prices will decrease, and subsequently, the volume of export will increase. Invariably, this will attract investors in the stock market and the higher demand for stocks will push returns up. This is in line with many studies carried out by researchers around the globe. Prominent amongst them are studies by [22] and [23]. Their studies confirmed the existence of this positive relationship in Japan and Indonesia which are amongst large exporting countries. Other studies by [24] showed that an increase in stock prices has a negative short-term effect on domestic currency values, but a positive effect in a long term. On the contrary, they found that currency depreciation has both a negative short and long term effect on stock returns.

### **2.1.1.4 Inflation Rate and Stock Market Returns**

Inflation as defined by [25] and [15] is the general and persistent rise in prices of consumer goods and services. This usually leads to a decrease in the purchasing power when it occurs with the effect that each unit of income will comparatively, buy less goods and services. There are many measures of inflation but, in this

study inflation is as measured by the consumer price index and reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.

The Fisher Effect postulates that expected nominal asset returns have a unitary effect on inflation. By implication, the Fisher hypothesis predicts a direct positive relationship between inflation and stock returns. Empirical evidence however, most often than not diverges from the Fisher effect, and inflation relates negatively with stock returns. According to [15] expected and unexpected inflation determine the type of relationship between inflation and stock returns. Elucidating on this, when supply is surpassed by demand; producers tend to add prices which result to more returns and higher dividends payout adding value to the shares of the companies.

Monetary authorities in Nigeria have always targeted a single digit inflation. From the start of the period of study, inflation was 7.4% in 1985, dropped to 5.7% in 1986. After the introduction of SAP in 1986, exchange rate was left to be determined by the market forces, inflation rate immediately rose to 11.3% in 1987, and in 1989, it was 50.5%. It dropped to 13 in 1991 before rising to a record peak of 72.8% in 1995. By 2005 it was 17.9% and ended at 9% in 2015 before surging to 15.7% in 2016. We can see that inflation rate has undergone a lot of perturbation in the last 3 decades under study.

#### **2.1.1.5 Interest Rate and Stock Market Returns**

Interest rate can be viewed as the compensation (price per se) the investor (lender) receives for parting for a period with (lending) his money to the borrower. In the words of [26], the interest earning is considered as the earnings from alternative source of investment. In this regard, as the interest rate rises, people tend to divert their money from share market to banks. This is expected to trigger a fall in the price of shares. An increase in interest rate would raise the required rate of return in the bond market and following the law of comparative advantage, the share price would decrease with this increase in the interest rate because an increase in interest rate would raise the opportunity costs of investing in shares and the tradeoffs to holding other interest bearing securities. Ultimately, investors would prefer investing in interest bearing securities with an increase in interest rates so as to benefit from high returns. Consequently, the price of shares would fall connoting a negative effect of interest rate on stock returns. Interest rate in this study and in accordance with many works reviewed shall be represented by the prime lending rates as it aptly represents the opportunity cost of holding shares.

#### **2.1.1.6 Market Capitalization and Stock Market Returns**

According to [27], the market capitalization is equivalent to the total value of listed shares in a nation's stock market. It is "A measurement of corporate size". It can also be referred to as the value of a company, reflecting the number of outstanding stocks multiplied by the number of current stock price. In [28]'s view, stock market capitalization is the amount of money it would cost if one were to buy every single share of stock a company had issued at the then-current market price. The measure is calculated by taking the market capitalization of all companies in the stock market and adding them together to arrive at the capitalization for the market as a whole. The economic relevance of market capitalization is that the market size is assumed to be positively correlated with the ability to mobilize capital and diversify risk. It is one of the most important characteristics that help the investor determine the returns and the risk in the share. It also helps the investors choose the stock that can meet their risk and diversification criterion. A lot of professional investors divide their portfolio by market capitalization size. These investors do this because they believe that it allows them to take advantage of the fact that smaller cap companies have historically grown faster but larger cap (blue chips) companies have more stability and pay fatter dividends. From the fore going, it becomes logical for us to examine the effect of market capitalization on stock market returns. Quite a handful of studies have been conducted to ascertain the effect of stock market capitalization on stock market returns. [29] showed that market capitalization had a long run relationship with stock returns in Bangladesh stock Exchange.

[27] showed that there is strong relationship measured above ninety-one percent (91%) between stock market capitalization and the performance of the Nigerian economy. Invariably, this should affect stock performance. This let him to conclude that the Nigerian stock market is one of the strongest in Africa and also the best emerging market in the world.

### **2.2 Theoretical Framework**

This work is anchored on The Arbitrage Pricing Theory (APT) and the Efficient Market Hypothesis (EMH)

#### **2.2.1 The Arbitrage Pricing Theory (APT)**

The asset pricing approach uses the Arbitrage Pricing Theory (APT) to address the question of whether risk associated with particular macroeconomic variable is reflected in expected asset return. The Arbitrage

Pricing Theory (APT) propounded by [30] states that provided arbitrage does not exist; the return on any risky asset is a linear combination of various macroeconomic factors that are not explained by this theory.

It includes multiple numbers of risk factors as opposed to a single risk factor proposed by the Capital Asset Pricing Theory (CAPT): The APT starts by assuming that there are  $n$  factors which cause asset returns to systematically deviate from their expected values. It specifies a simple linear relationship between assets, returns and the associated  $n$  factors although it does not specify how large the number  $n$  is, nor does it identify the factors or criteria for selecting the factors. It simply assumes that these  $n$  factors cause returns to vary together. Thus, the APT states that the expected return on a stock or other security must adhere to the following linear relationship:

$$r = r_f + b_1RP_1 + b_2RP_2 + \dots + b_nRP_n,$$

where  $r$  = the expected return for a given stock or portfolio

$r_f$  = the risk-free rate

$b_i$  = the sensitivity (or reaction) of the returns of the stock to unexpected changes in economic forces  $i$  ( $i = 1, \dots, n$ )

$RP_i$  = the market risk premium associated with an unexpected change in the  $i$ th economic force

$n$  = the number of relevant economic forces

According to [31] this theory is based on the idea that equilibrium market prices should be perfect, in such a way that prices will move to eliminate buying and selling without risks (arbitrage opportunities). The theory requires that the number of assets under consideration,  $n$ , be larger than the number of factors,  $k$ , and the noise term,  $i$ , be the unsystematic risk components of risk. Since the number of factors,  $n$ , are not succinctly stated, nor is the list of the factors exhaustively given, it becomes necessary for us to examine the situation in the Nigerian Stock exchange with a couple of variables at our disposal.

### 2.2.2 Efficient market hypothesis (EMH)

On its part, the focus of the efficient market hypothesis (EMH) is on factors that encourage as well as boost the efficiency of the market. For instance, the flow of information into the market and the adjustment of prices and or products as information are received in the market. The existence of only a handful of companies in the market operating as cartels or monopolists, for example, deny investors the benefits of fair price brought in by competition. This does not auger well for the market as its efficiency may be compromised. In such a scenario, the regulator may choose to relax new entry and licensing rules to enable more companies to enter the market, thereby enhancing efficiency. A common goal of most of the regulatory efforts has been the strengthening of competition within the industry and as well as the lowering of prices and the improvement of product offerings [32]. This is in a bit to attain market efficiency which according to Fama (1970) as reported in [33] may exist in the weak form when current securities prices reflect all past prices and price movements; semi strong form when all publicly available information is incorporate; and in the strong form when stock prices reflect all public and private information. In the strong form therefore, the market, including all investors, knows everything about all securities, including information that has not been released to the public.

When the stock market is efficient, it is able to play its proper role in an economy. These roles include capital Formation (structures are put in place for the mobilization of savings from various surplus economic units for the productive process, thus enhancing economic growth and development), allocative and operational efficiencies, risk diversification through internationally integrated stock markets, promotion of the acquisition of information about firms, which may enable investors to make money and to profit from such information, and also influence corporate control as a result of stock market development [34]. According to [35], net capital formation arises from new issues and excludes transactions in the secondary market. This study assumes that the NSE is at least weak form efficient which is the case with most less advanced nations.

### 2.3 Empirical Literature Review

The earliest researchers whose work became famous on the subject were [1] who used short term and long term interest rates, expected and unexpected inflation rate and industrial production growth to explain stock returns in the US stock market and found a positive relationship. On a similar vein, [2] examined if a similar relationship between macroeconomic variables and stock return exists in Japanese market and his findings were consistent with [1] with only industrial production showing a negative relationship. In England and in line with [1]; [3] studied the United Kingdom market and found no such relationship exists in the United Kingdom market as they do in the US. Since then, it has been popular both within and out of Nigeria to study the relationship between macroeconomic variables and stock returns, and the results have been mixed. For instance,

[36] showed that CPI and exchange rates are positively related to stock return at Karachi stock market, but negatively related to Istanbul stock exchange and Lahore stock exchange. Their findings also showed that M2 affects stock return negatively while Treasury bill rates had a mixed effect in the above mentioned markets. One of the latest works carried in Nigeria for instance was by [37] who examined the effect of selected macroeconomic factors on stock market performance from 1986 to 2015 and found out that a combination of Gross Domestic Products, money supply, interest rate, inflation rate and exchange rate could not be used to predict performance of the stock market in Nigeria. He concluded that stock prices is not a leading indicator of macroeconomic variables in Nigeria and that movements in stock prices cannot actually be explained by macroeconomic factors. Consistent with this result was studies by [38] who used multiple regression technique and Pearson's correlation to examine the impact of Macroeconomic Factors on Common Stock Returns on 10 Listed Manufacturing Firms in Nigeria. The result showed that none of the four independent variables (inflation rate, interest rate, exchange rate of domestic currency and gross national income) examined has significant impact on the common stock returns of the sampled firms. Thus, they concluded that macroeconomic factors cannot be used to explain the Nigerian stock exchange.

This result contrasted with that of [39] who examined the relationship between interest rates, inflation rates, exchange rates, fiscal deposit, gross domestic product, money supply and the stock market index in Nigeria using vector error correction model (VECM) for the period 1975-2005. They found that macroeconomic variables influence the stock market in Nigeria. This notwithstanding, the difference in their result could be attributable to the time lapse of 11 years (2005 – 2015). Another contrasting result was that of [40] who applying a sectorial approach, examined the effect of macroeconomic factors including market capitalization on the Nigerian stock returns. The result of the Ordinary Least Square (OLS) regression revealed that there are no significant effects of those variables on the stock returns in Nigeria.

Other studies in Nigeria showed a mixed result. For example employing cointegration and vector error

correction model tests, [20] findings indicated that Nigerian stock market prices have long-run relationship with macroeconomic variables. Furthermore, while M2 has a positive long run effect as expected, contrary to a priori expectation, GDP has a significant long-run negative effect on stock prices. In the short run however, they found both GDP and M2 have positive but insignificant effect on stock prices in Nigeria. They concluded that in Nigeria it is difficult to predict stock prices based on macroeconomic factors. Similarly, [41] examined the relationship between macroeconomic variables and the movement of share prices in Nigeria brewery industry with emphasis on Nigeria Breweries Plc. Ordinary Least Squares multiple regression method was used. The result indicates a positive but insignificant relationship between share price and inflationary rate, real GDP and exchange rate while a negative and insignificant relationship is found between share price and interest rate as only 13% of the variations in share price could be explained by the independent variables. Also, using time series quarterly data from 1986-2012, [42] investigated the relationship between exchange rate and inflation volatility and stock prices volatility in Nigeria by employing GARCH(1,1), GARCH(1,1)-S, and GARCH-X models. The findings of the study showed that there is a negative relationship between stock market prices volatility and exchange rate and inflation volatility in Nigeria. Extant foreign studies reviewed equally showed mixed results. Prominent amongst them include; [15] who conducted studies in some emerging economies on impact of Macroeconomic Variables on their Stock Markets. Results indicated that there is a causal relationship in Egypt between market index and consumer price index (CPI), exchange rate, money supply, and interest rate. The same goes for Tunisia except for CPI, which had no causal relationship with the market index. Results also revealed that the four macroeconomic variables are co-integrated with the stock market in both countries.

[16] carried out studies on macroeconomic factors and the Pakistani equity market and the result of the study revealed that exchange rate, money supply, and real interest rate have no statistically significant impact on stock market returns but there was a significant positive impact of current GDP in the short run and a significant negative impact on lag term of GDP on stock returns. The positive impact was consistent with previous studies leading to a conclusion that GDP is the most important factor among the selected macroeconomic variables to influence the Pakistani equity market.

[43] examined dynamic association between macroeconomic variables and stock return volatility in India and found that only exchange rate has a significant negative effect and equally has a bidirectional causal effect on stock returns. Although oil prices and inflation had a negative impact, the impact was not statistically significant.

The Effect of Macroeconomic Variables on Stock Market Returns in Ghana between 2000 and 2013 were studied by [8] and the findings revealed that interest rates and money supply had a significant negative effect on stock market returns, but exchange rates had a significant positive effect on stock market returns and inflation rate did not significantly affect stock market returns in Ghana. Examining the inflation – stock market nexus, [44], worked on the Ghana stock exchange and found a negative statistically significant relationship

between inflation and stock returns in the short run and a positive statistically significant relationship in the long run. They equally noted a unidirectional causality running from inflation to stock returns, implying that inflation drives stock market returns towards long-term equilibrium in the Ghanaian stock exchange market. Studies on selected macroeconomic variables and stock market movements in Thailand by [7] revealed that M2 demonstrates a strong positive relationship, CPI and IP showed a negative long run relationship, a bi-causal relationship with CPI, while a uni-causal relationship with IR and M2. The implication of these results is that all the variables are sensitive to stock market movements in Thailand.

### III. Methodology

The study adopts *ex-post facto* research design and relies on historical time series data collected from the Central Bank of Nigeria (CBN) annual statistical bulletin from 1986 – 2016, and from International monetary Fund (IMF) data base for 2016.

#### 3.1 Model specification

The Autoregressive Distributed Lag (ARDL) modelling approach originally introduced by [45] is used. A key advantage of ARDL approach is that it can be applied irrespective of degree of integration. Equally, according to the authors of the approach, ARDL approach provides robust results in small sample sizes and estimates of the long-run coefficients are well consistent in small sample sizes. In addition, a dynamic error correction model (ECM) can be derived from ARDL that integrates the short-run dynamic with the long-run equilibrium without losing long run information. In view of the above advantages, we use an ARDL approach for cointegration analysis and the resulting ECM.

This work therefore adopts the ARDL model of [16]. The model is stated thus:

$$\Delta MR_t = \beta_0 + \sum \beta_1 \Delta MR_{t-i} + \sum \beta_2 \Delta \ln GDP_{t-i} + \sum \beta_3 \Delta \ln MNS_{t-i} + \sum \beta_4 \Delta RIR_{t-i} + \sum \beta_5 \Delta EXR_{t-i} + \mu_t$$

The model is modified in this study to:

$$\Delta STR_t = \beta_0 + \sum \beta_1 \Delta STR_{t-i} + \sum \beta_2 \Delta M2_{t-i} + \sum \beta_3 \Delta INF_{t-i} + \sum \beta_4 \Delta EXC_{t-i} + \sum \beta_5 \Delta INT_{t-i} + \sum \beta_6 \Delta MC_{t-i} + \mu_t \dots\dots\dots 1$$

Where

STR = Stock Market Returns derived from All share Index and represents the dependent variable

The independent variables include;

M2 = Money supply (Broad Money) as a percentage of the GDP

INF = Inflation represented by the Consumer Price Index (CPI)

EXC = Exchange Rate ( the average annual exchange rate of naira to US dollar)

INT = Interest Rate (savings rate)

MC = Market Capitalization (Total capitalization of the stock market)

$\beta_0 - \beta_6$  = the reaction coefficients that evaluate the change in market return in the macroeconomic factors otherwise called estimated coefficients.

$\Delta$  = Difference operator

t-i, t-j, t-k, etc are unknown lags to be determined.

$\mu$  = error term.

Equation 1 assumes that all variables are well behaved, which implies that the variables are stationary at order zero.

#### 3.4 A priori expectation

A priori expectation for the study is as follows:

$A1 > 0$ ,  $A2 > 0$  in a case of expected inflation,  $A2 < 0$  in a case of unexpected inflation

$A3 < 0$ ,  $A4 < 0$ , and  $A5 > 0$

### IV. Results Discussion

#### 4.1 Unit Root Test result

The summary of the Augmented Dickey Fuller unit root test results for all the variables under study is presented in table 1

**Table 1: Results of the Unit root tests**

Null Hypothesis : Variable has a unit root

Variable	TEST CONDUCTE D -	Mackinnon Critical Value at 5% probability level	Level ADF Test Stat	Mackinnon Critical Value at 5% probability level	1 <sup>st</sup> Difference ADF Test Stat	Order of Integration
<b>STR</b>	ADF	-3.587527	-3.711643		-	I(0)
<b>M2</b>	PP	-2.963972	-0.554874	-2.967767	-4.861712	I(1)
<b>INF</b>	ADF	-2.998064	-3.875441	-	-	I(0)

<b>EXC</b>	ADF	-2.963972	-6.361375	-	-	I(0)
<b>INT</b>	ADF	-2.963972	-4.505509	-	-	I(0)
<b>MC</b>	ADF	-2.963972	-4.486120	-	-	I(0)

Source: Author's Summary Computation extracted from Eviews 9.0 output

The unit root test result in Table1 shows that while STR, INF, EXC, INT, and MC are stationary at level, I(0), M2 is stationary at 1st difference, I(1). ADF test did not confirm the stationarity of M2 at level and at 1st difference, but the PP test which is superior to ADF did confirm its stationarity at I(1). The results indicate a mixed order, I(0) and I(1) necessitating the use of ARDL bound testing and cointegration technique for analysis instead of the traditional Engle granger technique as well as Johansen cointegration techniques which are less robust..

**4.2 Cointegration test -The ARDL Bound test result**

The ARDL bound testing result is presented in table 2.

**Table 2 ARDL Bounds Test**

Date: 07/28/18 Time: 22:17			
Sample: 1989 2016			
Included observations: 28			
Null Hypothesis: No long-run relationships exist			
Test Statistic	Value	k	
F-statistic	3.841371	5	
Critical Value Bounds			
Significance	I0 Bound	I1 Bound	
10%	2.26	3.35	
5%	2.62	3.79	
2.5%	2.96	4.18	
1%	3.41	4.68	

Source: Output from Eviews 9.0

As seen from Table 2, the F-statistic of 3.84 is greater than the critical value upper bound at 5% and 10% level of significance. This shows that there is cointegration between the dependent and the independent variables implying a long run relationship exists between Stock Returns (STR) and the explanatory variables, namely, Money supply (M2), Inflation (INF), Exchange rate (EXC), Interest rate (INT), and Market capitalization (MC) in the Nigerian economy within the period under study. This result implies we could move ahead with further analysis of the short run and long run dynamics of the data.

**4.3 Autoregressive Distributed Lag (ARDL) short run and long run Dynamics**

The short run and long run dynamics of the data is presented in table 3 and table 4 respectively.

**Table 4 Short Run Dynamics**

Dependent Variable: STR  
 Selected Model: ARDL(1, 1, 2, 2, 1, 0)  
 Date: 07/28/18 Time: 22:29  
 Sample: 1986 2016  
 Included observations: 29

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2)	-9.525977	4.201795	-2.267121	0.0376
D(INF)	0.547443	0.417212	1.312145	0.2080
D(INF)	-0.771939	0.519704	-1.485343	0.1569
D(EXC)	-0.029797	0.038885	-0.766272	0.4547
D(EXC(-1))	-0.126454	0.040378	-3.131764	0.0064
D(INT)	1.477412	2.024895	0.729624	0.4762
D(MC)	0.386593	0.240668	1.606328	0.1278
CointEq(-1)	-1.081785	0.328797	-3.290128	0.0046

$$\text{Cointeq} = \text{STR} - (-0.5304*\text{M2} + 0.4826*\text{INF} + 0.1238*\text{EXC} + 4.5811*\text{INT} + 0.3574*\text{MC} - 85.7517)$$

Source: Output from Eviews 9.0

The results of the short run dynamics in table 4 reveal that the current values of inflation, interest rate and market capitalization have a positive effect on the current value of stock market returns in the short run although the effect is not statistically significant. Meanwhile money supply and lagged values of exchange rate each has a negative and statistically significant effect on stock market returns in the short run. The error correction term (ECTt-1) which is the adjustment coefficient is of the expected negative sign and also significant. This term tells the rate at which disequilibrium is offset in order to reach equilibrium. It measures the speed of adjustment.

The absolute value of the coefficient of the error-correction term indicates that about 100% of the disequilibrium in the STR is corrected by short-run adjustment in each year. In other words, 100% disequilibrium in the short-run between stock market return and macroeconomic variables is adjusted within one period.

**Table 4.5 Long Run Coefficients**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	-0.012790	0.003882	-3.295011	0.0032
INF	0.469086	0.392739	1.194396	0.2445
EXC	0.322422	0.248031	1.299925	0.2065
INT	3.871627	2.341239	1.653666	0.1118
MC	0.010926	0.003384	3.228990	0.0037
C	-34.444655	33.909227	-1.015790	0.3203

Source: Output from eviews 9.0

The long run coefficients show that Inflation, exchange rate, interest rate, and market capitalization also have a positive effect on stock market returns in Nigeria but only the effect of market capitalization is statistically significant while money supply has a negative and statistically significant effect on stock market returns. This result is consistent with some works reviewed in the literature, but inconsistent to others. For instance, contrarily to this study, [20] found a positive though insignificant effect of money supply on Nigerian stock indices, while [7] found strong positive effect of money supply on Thai stock exchange. However, [36], [46], and [8] in their various studies in Pakistan, Turkey, India, and Ghana respectively, found that money supply ( M2) affects stock return negatively which is consistent with this study. Theoretically, money supply should have a positive effect on stock returns because firstly, more money is available for consumption, and secondly, for investment. More investment, all things being equal, implies more returns. A negative effect of money supply on stock returns in Nigeria could imply that money has not been properly channelled to the real sector of the economy for productive purposes, and as such lie fallow at times in unproductive hands, or carelessly spent, thereby contributing to unexpected inflation. The magnitude of the long run coefficient of M2 in the model of -0.12790 shows that a 1% change in money supply would lead to 13 % decrease in stock returns.

The positive effect of inflation on stock market returns is contrary to the studies conducted by [42], [47] in Nigeria, [44] in Ghana, [48] in Stockholm, as well as [49] in Jordan who found a negative effect of inflation on stock market returns in their respective countries. The positive effect of inflation on stock market returns in this study is however, consistent with many studies conducted both in Nigeria and elsewhere ([41] in Nigeria; [17] in Nairobi Kenya; [44] in Ghana; [36] in Pakistan, Turkey and India). Theoretically, the Fisher hypothesis predicts a direct positive relationship between inflation and stock returns. Accordingly, [48]; [15] opined that expected inflation has a positive effect on stock market returns. In this regard, when supply is surpassed by demand; producers tend to add prices which result to more returns and higher dividends payout adding value to the shares of the companies. The result of this study tend to be in line with this assertion as inflation in Nigeria kept improving within the period from a double digit to a fairly stable single digit within the last four years, though it shot up to a double digit again in 2016.

The long run positive effect of exchange rate on stock market return is consistent with other studies. For instance, [50] in India, [8] in Ghana, [51] in US, [36], [43] in India all found a positive effect of exchange rate volatility, real exchange rate on stock market returns in their respective studies. Other [52]; [43] found a negative effect of exchange rate on stock market returns. The positive relationship revealed in this study is in line with theoretical underpinnings. It is common knowledge that so long as the demand for a product is elastic, when a nation's currency depreciates against foreign currencies, export product prices will decrease, and subsequently, the volume of export will increase. This will invariably attract investors in the stock market and the higher demand for stocks will push returns up. This is in line with many studies carried out by researchers around the globe. Prominent amongst them are studies by [23]; [46]. Their studies confirmed the existence of this positive relationship in Japan and Indonesia which are amongst large exporting countries. This is also true

in the Nigerian scenario as evidenced by this study and as depicted by the exchange rate statistics in the past three decades. The currency has been on the average, depreciating ever since the financial liberalization of 1986 and we believe in this study that this is favouring exporters as their products are relatively cheap compared to other currencies. This is helping them to grow their companies and add value to it, hence high rate of market returns.

The sign of the coefficient of interest rate is positive contrary to a priori expectations. This implies that interest rate has a positive effect on the Nigerian stock exchange. This is in line with some previous studies including; [26]. The magnitude of the coefficient of 3.87 indicates that an increase in interest of 1 unit, will lead to a corresponding increase of 3.9 units in stock market returns. Theory demands that an increase in interest rate will cause investors to focus on bonds for higher interest gains. This will trigger a rush to withdraw shares and convert them to savings and bonds. As such, prices of shares will drop leading to low stock market return. Theoretically therefore, interest rate is expected to have a negative effect on stock market returns. A positive effect of interest rate on stock market returns could imply that the bond market is not effective, and or the intermediation process by banks is not optimally implemented.

The long run coefficient of market capitalization is positive and statistically significant. The positive sign is in line with a priori expectation though the magnitude of the coefficient shows that the effect of market capitalization in Nigeria is minimal. The coefficient shows that a 1% increase in market capitalization will lead to a 1% increase in the stock market returns. This however, implies that the stock market in Nigeria is to a lesser extent, sensitive to stock returns. This result is consistent with many other previous studies. For instance [53] found a positive effect of market capitalization on stock market returns in Pakistan, [54] in Thailand, [55] in Nigeria. However, a study by [40] revealed that market capitalization has no significant effect on stock market returns.

#### 4.4 Forecast Sample Plot

In order to investigate the predictive ability of the model under study, the sample forecast of the explained variable is plotted as reported in Fig 1. It can be seen clearly from the sample plot that the model is able to track the historical values of the explained variable with a certain degree of accuracy implying that it has a good predictive ability.

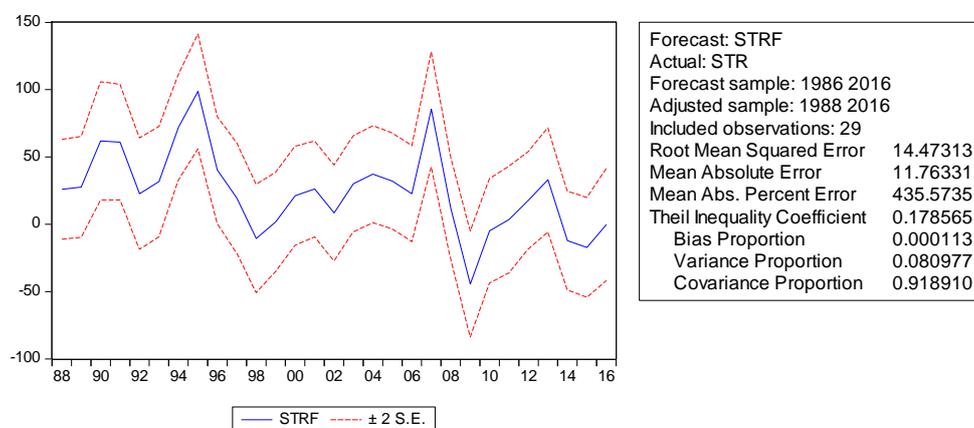


Figure 1: Sample forecast plot of the explained variable (Source: Output from Eviews 9.0)

#### 4.5 Stability Test

This study equally tested for the stability properties of the model using cumulative sum of residual (CUSUM) and cumulative sum of residual square (CUSUMSQ) test. According to [56] the existence of parameter instability is established if the cumulative sum of the residuals and cumulative sum of residuals square go outside the area between the two critical (dotted) lines. It is estimated at 5% critical level, Fig 2. It can be deduced from Fig 2 that for the period under study, stability is established, since the CUSUM and CUSUM Square did not go outside the critical line thus adding to the robustness of the study.

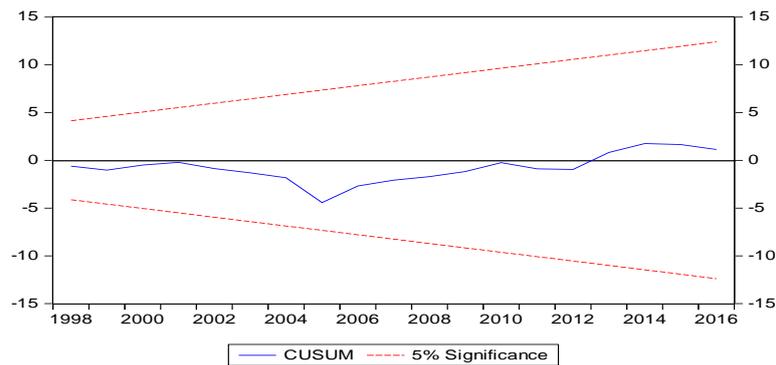


Figure 2: cumulative sum of recursive residuals (Source: Output from eviews 9.0)

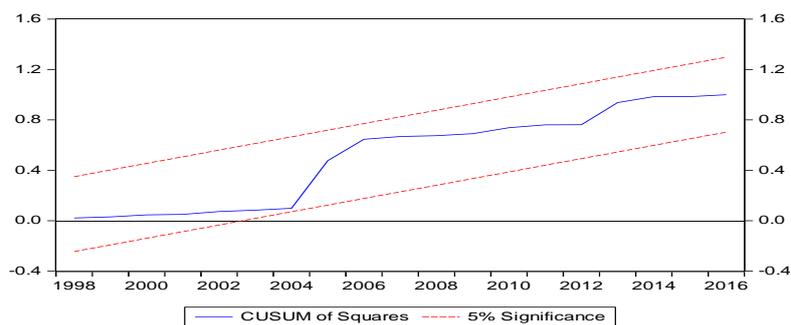


Figure 3: cumulative sum of squares of recursive residuals (Source: Output from Eviews 9.0)

## V. Conclusion

The study established a long run relation between stock market returns and Money supply (M2), Inflation rate (INF), Exchange rate (EXC), Interest rate, and Market capitalization (MC). Specifically, money supply has a negative, but statistically significant effect on the performance of Nigerian Stock market. The rest of the variables have a positive effect on the stock market returns in the long run. However, while the effect of inflation, exchange rate, and interest rate are statistically insignificant, the effect of market is statistically significant. It was equally established that the variables studied explain about 57.07% of the model used. We conclude that to an extent, Macroeconomic variables can be used to predict the stock market performance in Nigeria. Various inferential tests conducted supported the conclusion. These results are contrary to many studies reviewed in Nigeria including [37], who found no effect of macroeconomic variables on stock returns in Nigeria [40] whose study revealed that market capitalization has no effect on stock returns in Nigeria. The result is however, consistent with many others outside of Nigeria including [46], [26] [36] who concluded macroeconomic variables can be used to an extent to predict the stock market performance. The study recommends enhancement of transparent management to attract more capital from investors, improve the circulation of available information and check against the buy and hold attitude for speculative purposes while enabling interest rate to play its proper role in the stock market. Equally, Since the study shows that money supply has a negative but statistically significant effect on stock market returns contrary to a priori expectations, a monetary policy that will lead to mopping up cash lying fallow in the economy should be instituted. The mopped-up cash can then be redirected to productive investment projects that will contribute positively to stock market returns. In other words, proper monetary policies will enable the money supply to be well channelled for proper use in the real sector of the economy leading to a direct effect on the stock market

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