The HELLENIC OPEN BUSSINES ADMINISTRATION *Journal*

Volume 4 - 2018, No 1

Edited by: ***Dimitrios A. Giannias****, Professor*
HELLENIC OPEN UNIVERSITY

ISSN: 2407-9332

Athens2014
Publisher: D. Giannias

Volume 4 - 2018, No 1

A TIME SERIES ANALYSIS OF THE NEXUS BETWEEN MACROECONOMIC FUNDAMENTALS AND STOCK PRICES IN NIGERIA

Amassoma, Ditimi
FEDERAL UNIVERSITY OYE-EKITI, NIGERIA

Bolarinwa Ifeoluwa
FEDERAL UNIVERSITY OYE-EKITI, NIGERIA

ABSTRACT

Since macroeconomic fundamentals have been found to play a vital role for changes in the economy of a country. Consequently, the onus is on the appropriate regulatory authorities to take measures in making amendments in these policies to put the economy on the right development track. The aim of this study is to use time series analysis to empirically showcase the nexus between macroeconomic fundamentals and stock prices in Nigeria. The method used for this study was the Co-integration test and the EGARCH technique to estimate the possible influence of the selected macroeconomic fundamentals on stock prices. Volatility was captured by using quarterly data and estimated using GARCH (1,1) respectively. The study found there is a positive relationship between macroeconomic factors and stock prices in Nigeria. Therefore, the study recommends that the Federal authority should put in place policy measures that will enable the exchange rate to be relatively stabilized. This is because empirical evidence from studies has shown that exchange rate affects stock market prices. In addition, the government authority should ensure an enabling environment that would build the mindset of institutional investors in the Nigerian stock market due to the existence of information asymmetry problems among potential investors.

Key words: Time series Model, Stock Market, EGARCH, Macroeconomic Policy, Nigeria, Financial Market, E-views, Macroeconomic impact

JEL Classification: C11, C87, E61, F62, O55, G12

1.0 INTRODUCTION

The role that macroeconomic fundamentals plays on stock market prices cannot be over emphasized in any nation whether developing, under developing or developed. Recently, many studies have been conducted to investigate this relationship yet the outcome of their findings has been with a lot of contentions and mixed feelings (Ibrahim, 1999; Habibullah and Baharumshah 1996a & 1996b). The reason policy makers and government agencies to mention a few are interested in this area of stock is basically because the stock market has been recognized to play a high-flying role in the macroeconomic development of a country. Evaluating the from the theoretical viewpoint, it has been affirmed that the stock market closely correlate with the macroeconomic variables of a country be it developed or emerging due to stock prices being viewing as the discounted present value of expected future cash inflows. When evaluated from a simple discount theory, it is believed that the key values of a corporate stock are equal to the perceived present value of projected future dividends, making the expected future dividends to epitomize the real economic activity. In the same vein, the volatility of stock prices exhibit the tendency to rely on the volatility of expected future cash flows and future discount rates. Possibly because the value of corporate equity at the aggregate level depends on the state of the economic activity, hence, making it likely that any variation in the level of say uncertainty of future macroeconomic condition would exhibit the likelihood to cause a change in stock returns.

Expectedly, it is asserted that all things being equal, changes in macroeconomic environment can affect the price of shares/ stocks. For example, Arbitrage Pricing Theory stress that the relationship between stock price vis-à-vis the stock market returns has been established according to Ross (1976). This makes potential investors and portfolio manager to look inward of such a stock market where the acclaimed macroeconomic indicators lose their sense of direction. Hence, portraying the stock market as a very risky platform of investment despite, the inherent role it can play in the economy of a country. Therefore, making the potential investors to evaluate the opportunity cost vis-à-vis the stock market prices by capitalizing on prices/ returns that will yield maximum benefits and with a minimum future risks.

Hence, the reason this study is focus on investigating empirically the influence of macroeconomic fundamentals on stock prices in Nigeria. By this, the study aims to examine how sensitive stock prices are to variations in macroeconomic fundamentals. Specifically, the study attempts to examine whether the Nigerian stock price has any significant influence on money supply, exchange rate, real gross domestic product and consumer price index. Then to achieve the above mentioned objectives of the study, the study hope to provide answers to questions like: Does the macroeconomic fundamental affect the movement of stock prices in Nigeria? Is there any interrelationship between macroeconomic fundamental and stock prices in Nigeria? Notably, the answer to the above raised questions could provide useful information to policy makers and economists to provide plausible suggestions on how these variables should be controlled and enhance the economy. The results of this empirical research work would equally help the readers to also understand if the variation of prices on the Nigerian stock Exchange market can be subjected to some macroeconomic fundamentals changes. Prospective investor within and outside the country will find this study helpful in the sense it would help them to identify some fundamental economic variables they should pay attention to while investing in the stock market. Notably, this paper is a complement to other existing ones.

So the remaining part of this study would be structured into these sections and sub-sections. For instance, section B will cover the literature review and theoretical framework of the study. Section C entails the methodology and data source while section D showcases the empirical analysis of data and discussion of results. Next is section E which concludes and proffer policy recommendations.

2.0 THEORETICAL FRAMEWORK AND EMPIRICAL EVIDENCE

After a critical evaluation of both economic and financial theories, it was discovered that diverse theoretical frameworks theoretical backgrounds have been employed by numerous researchers to analyse the nexus between the variations in macroeconomic fundamentals with stock market prices. These among others include the semi strong efficient market hypothesis developed by Fama (1970) and the Arbitrage Pricing Theory (APT) developed by Ross (1976). These theories are briefly discussed in the below sub-sections as they relate the macroeconomic variables to stock market prices/returns.

2.1 Theoretical Underpinning

2.1.1 The Efficient Market Hypothesis

The efficient market hypothesis is popularly described and known as random walk theory. The theory assumes that stock market prices should embrace all information at any point in time. According to Fama (1970), efficient market on the average has the potential to cause competition that will arouse the full effects of new information on intrinsic values to be reflected instantaneously in actual stock prices. So this makes profiting from predicted price movements to be unlikely and very difficult as the efficient market hypothesis suggests that the main factor behind price changes is new information. Although, different information affects security values. In this study, focus will be on the semi strong hypothesis since it is the most convenient for our study. The semi strong hypothesis states that all publicly available information is already incorporated into current prices; that is the asset prices reflect all public information. Undeniably, the semi strong hypothesis can investigate the positive or negative relationship between stock return and macroeconomic variables since it postulates that economic factors are reflected in the price of stocks. Public information can also include data reported in a company´s financial statement, the financial situation of company´s competitors to mention few. Hence, information is public and making it impossible to make profit using information that everybody else knows. So the existence of market analysts must be able to understand the implication of vast financial information and to comprehend processes in product and input market.

2.1.2 The Arbitrary Pricing Theory (APT)

This theory was developed by Ross (1976). The theory posits another way of relating macroeconomic fundamentals to stock market return and however an extension of Capital Asset Pricing Model (CAPM) mentioned in this section based on the mean variance framework anchoring on the assumption of the process generating security. This further implies that CAPM is a one factor hypothesis which means a single independent variable-risk premium of the market. Notably, similar assumptions exist between CAPM and APT these among others include: competitive market, homogenous expectations, s and frictionless capital markets. On the contrary Ross (1976) unlike the former proposes a multifactor approach to explain asset pricing via the arbitrary pricing theory. According Ross (1976), the main influences on stock returns are some economic players such as; (1) unanticipated shifts in risk premiums; (2) changes in the expected level of industrial production; (3)

unanticipated inflation and (4) unanticipated movements in the shape of the term structure of interest rate. These factors are denoted with factor specific coefficients that measure the sensitivity of the assets to each factor. APT is a different approach to determining asset prices and it derives its basis from the law of one price. In an efficient market, two items that are the same cannot sell at different prices; otherwise an arbitrage opportunity would exits. APT requires that the returns on any stock should be linearly related to a set of indexes

2.2 Empirical Evidence

Economic theory and empirical studies consider stock prices and market index to be one best indicator that fluctuates the economic activities. No wonder, Chen et al. (1986) in their study explained and empirically showed that movements in macroeconomic variables affect future dividends and discount rates affecting stock prices. Smith (1990), in his study of the American stock price behaviour, observed that stock prices usually decline shortly (on average, for months), before a recession begins and rise shortly before a recession ends. Changes in consumption and investment opportunities are priced in capital markets, hence stock price changes are related to innovations in economic variables as opined by (Goswami and Jung 1997). Particularly, many economic fundamentals can be a signal to stock market participants to expect a higher or lower return when investing in stock and one fundamental are macroeconomic variables.

For instance, Hamburger and Kochin (1972) in their study showcased that, there exist a positive relationship between money supply and stock prices. This result conforms to the ideas of real activity economists who argued in support that an increase in money supply; so increasing money demand is a signal of an increase in economic activity where an increase in economic activity is an indication of higher cash flows which causes stock prices to rise as opined by (Sellin, 2001). As a follow up of Sellins' study, Grossman and Shiller (1980) examined how historical movements can be justified by new information by utilizing historical data from 1890-1979. Evidently, the outcome of their study shows that stock price movement can be more attributed to movement in real interest rate. Chen et al., (1986) in their study where they investigated the impact of macroeconomic variables on stock prices. In this study, they employed seven macroeconomic variables to test the multifactor model in the USA. Their results shows that consumption market index and oil prices are not related to financial market while industrial production, change in risk premium and twist in the yield curve are related to stock returns.

Following the above, Gjerde and Saettem (1999) in their study examined the relation between stock returns and macroeconomic variables in Norway. Evidence from their results, shows a positive relationship between oil price and stock returns and real economic activity and stock returns. Although, this study fails to show the significant relationship between stock returns and inflation. In consonance, to the, Bhattacharya et al., (2001) analyze the causal relationship between the stock Market and three macroeconomic variables in India by employing the Granger non-causality method. Notably, their results show there is no causal linkage between these macroeconomic variables (that is; exchange rate, foreign exchange reserves and trade balance) and stock prices.

Similarly, Doong et al., (2005) in their study based on six Asian countries, investigate the relationship between stocks and exchange rates using the Granger causality test. The outcome of their results shows that, there is a negative relationship between the stock returns and change in the exchange rates for all the included countries except one. Duca (2007) employs Granger causality test to examine direction of causality among stock prices and GDP in developed market economies. But the result points out a unidirectional causality which runs from stock prices to GDP and that no causality was found in the reverse direction in the developed economies market.

Dagadu (2010) established a long-run positive between stock price and gross domestic product in Ghana. The study used co-integration and ECM tests on monthly time series data for 1991-2008. The developed market economies like United States, Japan, Australia, United Kingdom and others was determined that stock prices Granger cause GDP excluding Germany due to its market capitalization. (Duca, 2007) employing standard and well accepted methods of co-integration and vector auto-regression (VAR) on monthly data for the period of January 1970 to August 1998, they found a positive long-run relationship between stock prices and gross domestic product. Co-integration test analysis is a standard method usually adopted in analyzing the long-term relationship between macroeconomic variables and stock markets. Suleiman et al. (2009), use multiple regression analysis on a sample covering the period 1986- 2006 for Kalachi Stock Exchange, found that index for industrial production does not affect stock prices.

In addition, Uddin and Alam (2007) examine the linear relationship between share price and interest rate and share price and changes of interest rate. In addition, they explore the association between changes of share price and interest rate and lastly changes of share price and changes of interest rate in

Bangladesh. They find for the cases that Interest Rate has significant negative relationship with Share Price and Changes of Interest rate has significant negative relationship with Changes of Share Price. Highlighted from Alatiqi and Fazel (2008), there is insignificant relationship between money supply and market stock price. They employed Engle-Granger co-integration test and the Granger causality test in their research. Absolute value from test statistic is lower than critical value. They verify that money policy has no long-run explanatory power in stock price prediction. Ozbay (2009) also suggested that monetary expansion do not granger cause bank's stock return. Hence, money supply is not an indicator to increase investments in stocks for Turkish case.

Geetha et al., (2011) investigate the relationship between stock market, expected inflation rate, unexpected inflation rate, exchange rate, interest rate and GDP with Malaysia, US and China. They use co-integration test to determine the number of co-integrating vectors, which shows the long-run relationship between the variables while the short-run relationship was determined using the Vector Error Correction model. Their results indicate there is a long run linear relationship between stock markets and those variables in Malaysia, US and China. There is no short run relationship between the stock market, unexpected inflation, expected inflation, interest rate, exchange rate and GDP for Malaysia and US using VEC. However, China's VEC result shows there is a short-run relationship between expected inflation rates and China's stock market. Gay (2008) investigates the relationship between stock market index price and the macroeconomic variables of exchange rate and oil price for emerging countries (Brazil, Russia, India, and China) using the Box-Jenkins ARIMA model. His results exhibits there is no significant relationship between respective exchange rate and oil price on the stock market index prices in the emerging countries. He concludes this result suggests that the markets of Brazil, Russia, India, and China exhibit the weak-form of market efficiency.

Mohammad (2011) uses Multivariate Regression Model computed on Standard OLS formula and Granger causality test to model the impact of changes in selected microeconomic and macroeconomic variables on stock returns in Bangladesh. He utilized monthly data for all the variables under study covering the period from July 2002 to December 2009. The study finds a negative relationship between stock returns and inflation and foreign remittance while market Price/Earnings and growth in market capitalization have a positive influence on stock returns. However, no unidirectional Granger Causality is found between stock returns and the independent variables and the lack of Granger Causality reveals the evidence of an informally inefficient market. Mohanamani and Sivagnanasthi (2014) examine the long-run

relationship and the short-run dynamics among macroeconomic variables and the stock returns of Indian. He uses the Johansen Co-integration test to indicate the co-integrating relationship between the stock prices and macroeconomic determinants. And then, he uses error-correction models to investigate both the short-and long-term casual relationships. The results show that the short-run causality runs from stock returns to inflation, from money supply to stock returns and from industrial production to stock returns. The long-run causality runs from inflation to stock returns and from exchange rate to stock returns. There is only one short-and long-run relationship, that is from the stock returns to industrial production.

Ray Sarbapriya (2012) uses a simple linear regression model and Granger causality test to measure the relationship between foreign exchange reserves and stock market capitalization in India. The results show that causality is unidirectional and it runs from foreign exchange reserve to stock market capitalization and that foreign exchange reserves have a positive impact on stock market capitalization in India. Many other early studies like that of Lintner (1973), Jaffe and Mandelker (1977) and Fama and Schwert (1977) examine the relationship between inflation and stock prices. Most of these studies test the Fisher Hypothesis which predicts a positive relationship between expected nominal returns and expected inflation and their findings contradict the Fisher hypothesis. They all reported a negative linkage between stock returns and inflation. However, Firth (1979) observes a positive relationship between nominal stock returns and inflation when studying the relationship between stock market returns and rates of inflation in the United Kingdom.

More recently studies like that of Ahmad eta l. (2015), Khodaparastic (2014), Yunus (2014), Singh (2014)and Venkatraja (2014) shows there is positive relative relationship between macroeconomic factors and stock returns/prices. Studies like Nijam (2015), Wasseja et al. (2015) and Khan and Ahmed (2015) in their studies exhibits there is a negative relationship. While few of the recent studies are of the view that the foresaid relationship are mixed that is some these macroeconomic variables showcased both negative and positive relationship with stock prices respectively.

Some brilliant Nigerian and oversea researchers have equally made some attempts to investigate the impact of macroeconomic factors on stock prices in Nigeria. These scholars among others include; Maysami et al., (2004), Maysami and Koh (2000) and Wong et.al, (2006) apparently, in their studies have proved that macroeconomic factors such as money supply, consumer price

index, exchange rate and real gross domestic products changes and will have impacts on the stock price movements and the stock market . Although, arguments have actually proposed on how these variables behave in influencing the stock price. Particularly, Osamwonyi (2003) noted that since the exchange rate is the price of a unit of domestic currency in a foreign currency, logically, a rise in it negatively affects the performance and profitability of industries relying on imports. External trade, Balance of Payments and the level of external reserves influence the exchange rate. Also, theoretically, there is a positive relationship between the exchange rate and the stock prices as pinpointed by (Akinnfesi, 1981).

Of late, Ogiji (2013) indicated that money supply has long-run linear relationship with stock market prices in Nigeria. The study applied co-integration test and error correction model on time series annual data for 1980-2012.Similarly, Akinlo (2015) analyzed the effect of two key macroeconomic variables (i.e. foreign exchange reserves and interest rate) on a stock exchange variable using regression method and causality test, the results show there is positive relationship between them. The results of the causality test discovered there exist a bi-directional causality them. In consonance with the above studies conducted by Osamwonyi and Michaeh (2014) and that of Nkechukwu et al. (2013) using co-integration test and regression analysis founds there is a long run linear relationship between these variables in the Nigerian stock exchange market.

Owing to the above review of empirical evidence, studies shows there are mixed feeling among researchers regarding the impact of macroeconomic fundamentals and stock prices and this study intends to investigate empirically the influence of some selected macroeconomic fundamentals has on stock prices in Nigeria not entirely different from the trend of previous studies.

3.0 METHODOLOGY AND DATA SOURCES

This study aims to investigate the influence of macroeconomic fundamentals on stock prices in Nigeria. Due to limitation of data availability, this uses quarterly time series data from Q_1: 1985 to Q_4 2014. The dependent variable stock prices which would be proxy by stock market capitalization and the independent variables are the macroeconomic fundamentals. Here, four (Money Supply, Consumer Price Index, Exchange Rate and Gross Domestic Product) key macroeconomic fundamentals are used for this study. The data used in this study were collected from various editions of the Central Bank of Nigeria (CBN) statistical Bulletin and Nigeria stock exchange publication. Due

to the nature of variation in exchange rate and stock prices, the GARCH/EGARCH techniques were used to estimate the volatility series. Importantly, this method measures the conditional variation in the dependent variable based on changes in the explanatory variables. The GARCH/EGARCH model better captures the essence of this purported relationship between stock price and macroeconomic variables.

3.1 Model Specification

This study is relying on the theoretical frameworks of Capital Asset pricing Model (CAPM) and the Arbitrary Pricing Theory (APT) popularized by both Ross (1976) and Fama (1970) respectively for building its model. , the (CAPM) posits that the mean variance framework anchoring on the assumption of generating security. So the model specification developed for this study is:

$$INDEX = f(CPI\ GDP\ EXCH,\ M2) \text{ -------} \quad (1)$$

The above equation is a functional form of the influence of macroeconomic fundamentals on stock prices in Nigeria.

$$LINDEX_t = \beta_0 + \beta_1 GDP + \beta_2 M2 + \beta_3 CPI + \beta_4 EXCH + \varepsilon_t \text{ -------} \quad (II)$$

The econometric specification of the above equation is as specified below;

Where:

INDEX = stock market all share index which is a proxy of stock prices in Nigeria.
CPI = Consumer Price Index,
GDP = Gross Domestic Product,
EXCH= exchange rate,
M2= Broad money supply and ε: Error terms.

Notably, the variables have been transformed into natural logarithm except for the exchange rates specifically, to obtain linearity and reduce the problem of heteroscedasticity. Ideally, all variables will carry a positive sign except consumers' price index (CPI).

3.2 Econometric Procedure

First, this study will employ the Augmented Dickey – Fuller (ADF) tests to verify the stationarity of the variables utilized. Here, it assumed that the null hypothesis is H_0: $\delta = 0$ which implies that the series contain a unit root and a lag will be chosen based on the Akaike Information Criterion (AIC). Second, this study employs the co-integration test suggested by Johansen (1990). Over the years in economic analysis, it has been discovered that macroeconomic time series data is non-stationary owing from the outcome of the simple regression estimated on the non-stationary data which is unreliable. The co-integration test would equally ascertain the long run linear relationship among the variables of interest. The co-integration test involves this procedure.

$$Y_t = \beta_0 + \beta_1 x_t + \beta_2 x_t + \ldots\ldots\ldots\ldots + \beta_k \beta_{kt} + u_t \qquad \text{(III)}$$

The co-integration equation shows the co-integrating relationship of all the independent variables with the dependent variable. In the co-integration equation, it is assumed that (k +1) series is stationary and homoskedastic. If on the contrary, the series heteroskedastic then it is assumed that the heteroskedastic co-integrating relationship can be modeled using Generalized Autoregressive Conditional heteroskedasticity (GARCH) model that is:

$$Y_t = \beta_0 + \beta_1 x_t + \beta_2 x_t + \ldots\ldots\ldots\ldots + \beta_k \beta_{kt} + u_t u_t \,|\Omega_{t-1} \sim iidN\ (0,\ ht) \quad \text{---------} \quad \text{(IV)}$$

Where yt is the dependent variable. β_0 is the constant.β_1 is the slope of series x_1 at time t. In same vein,β_2 is the slope of a series x_2 at time t. ut is the error term. Finally β_k is the slope of series x_k at time t.Ω is the information set. It is expressed that error term u_t is not independently distributed with zero mean and constant variance. Evidently, the Generalized Autoregressive Conditional Heteroskedasticity takes not only the lagged error Variances but also takes the time lagged variances while modeling volatility. The GARCH model, to be used in this paper, includes mean and linear volatility equations. The mean equation is going to be based on the assumption that logarithm of stock returns/ prices. To examine the effect of the stock market crash in the growth process of Nigerian economy, the model assumes an underlying relationship between some macroeconomic variables that can influence the economic growth of a nation measured as Gross Domestic Product (GDP).

$$g_t = v_0 + v_1 g_{t-1} + v_2 g_{t-2} + u^2_{t-I} \quad \text{--------} \quad \text{(V)}$$

Notably, equation V would explain the dependency of the variance of the error terms on the past error terms and also on the variance itself. Where g_t is the variance of the error term and the variance is assumed to depend on the variance of the error term at time t -1 and v_2 is the value of the error term at time t-2. g_{t-1} is the variance of the error term at time t-1 and gt -2 is the variance of the error term at time t-2. The heteroskedasticity would be checked by using Lagrange Multiplier (LM) test.

3.3 The Family of Autoregressive / General Autoregressive Conditional Heteroskedasticity (ARCH/GARCH) Models

3.3.1 Autoregressive Conditional Heteroskedasticity Model (ARCH)

Every ARCH or GARCH family model requires two distinct specifications: the mean and variance equations. According to Engel, conditional Heteroskedasticity in a return series y_t can be modeled using ARCH model expressing the mean equation in the form:

$$y_t = E_t(y_t) + \varepsilon_t \quad \text{..... (VI)}$$

So: $\varepsilon_t = \varphi_t \sigma_t$

Equation VI is the mean equation which also applies to other GARCH family model. $E_{t-1}[.]$ is expectation conditional on information available at time *t*-1, is error generated from the mean equation at time *t* and is a sequence of independent, identically distributed (IID) random variables with zero mean and unit variance. $E\left\{\varepsilon_t / \Omega_{t-1}\right\} = 0$ and $\sigma^2{}_t = E\left\{\varepsilon^2{}_t / \Omega_{t-1}\right\}$ is a nontrivial positive valued parametric function of Ω_{t-1} The variance equation for an ARCH model of order q is given as:

$$\sigma^2{}_t = \alpha_0 + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-1} + \mu_t \qquad \text{(VII)}$$

$$where\ \alpha_0 > 0; \alpha_1 \geq 0; i = 1, \ldots\ldots q_{-1} and\ \alpha q > 0$$

In practical application of ARCH (q) model, the decay rate is usually more rapid than what actually applies to financial time series data. To account

for this, the order of the ARCH must be at maximum, a process that is strenuous and more cumbersome.

3.3.2 The Exponential GARCH (EGARCH) Model

This model captures asymmetric responses of the time-varying variance to shocks and, ensures that the variance is always positive. It was developed by Nelson (1991) with this specification.

The conditional variance of EGARCH (1,1) model is specified generally as

$$\log(\sigma^2{}_t) = \beta 0 + \sum_{l=1}^{q} \left\{ \alpha 1 \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \gamma_i \left(\frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right) \right\} + \sum_{j=i}^{p} \beta_j \log(\sigma^2{}_{t-j}) \quad \text{……..(VIII)}$$

Where γ is the asymmetric response parameter or leverage parameter. The sign is expected to be positive in most empirical cases so a negative shock increases future volatility or uncertainty while a positive shock eases the effect on future uncertainty (Kaul, 2010). According to the author, in macroeconomic analysis, financial markets and corporate finance, a negative shock usually implies bad news, leading to a more uncertain future. Higher order EGARCH models can be specified in a similar way; EGARCH (p, q) is:

$$Ln(\sigma^2{}_t) = \omega + \sum_{j=1}^{p} \beta_j Ln\left(\sigma^2{}_{t-j}\right) + \sum_{t-1}^{q} \alpha_i \left\{ \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| - \sqrt{\frac{2}{\pi}} \right\} - \gamma_i \frac{\varepsilon_{t-1}}{\sigma_{t-1}}$$

……..(IX)

The EGARCH which captures asymmetric properties between returns and volatility was proposed to address three major deficiencies of GARCH model. They are (i) parameter restrictions that ensures conditional variance positivity; (ii) non-sensitivity to asymmetric response of volatility to shock and (iii) difficulty in measuring persistence in a strongly stationary series. The log of the conditional variance in the EGARCH model signifies that the leverage effect is exponential and not quadratic. The specification of volatility in its logarithmic transformation implies the non-restrictions on the parameters to guarantee the positivity of the variance, which is a key advantage of EGARCH model over the symmetric GARCH model.

3.4 The Sign Restrictions

The sign restrictions we impose on impulse responses here are:

CPI < 0

EXCH > 0.

GDP > 0.

M2> 0

3.5. Model Estimation Strategy

This is to ascertain the influence of macroeconomic fundamentals on stock prices in Nigeria. According to the methodology, this present study adopts a model used by the previous studies; the EGARCH as developed by Nelson (1991) model is applied in empirical work to estimate the variance equation properly and to capture potential asymmetry in the behavior of the stock market index.

4.0 DATA ANALYSIS, INTERPRETATION AND DISCUSSION

In this session, the impact of consumer price index, exchange rate, money supply, gross domestic product (GDP), consumer price index (CPI) and stock price are tested and presented.

4.1 Descriptive Statistics

The Jarque-Bera (JB) test statistic was used to determine whether macro-economic variables and the NSE stock share index follow the normal probability distribution.

Table 1: Summary Descriptive Statistics for Variables

Statistics	INDEX	EXCH	CPI	M2	GDP
Mean	44610.61	124.1110	134.2758	15213.67	68948.19
Median	19275.70	121.4030	142.1733	16840.44	86059.93
Std. Deviation	75082.88	23.37886	24.52201	4456.151	32414.02
Skewness	5.828881	-2.071495	-3.083577	-2.580931	-1.436511
Kurtosis	49.86603	10.24881	11.22959	8.018602	3.157883
Jarque-Bera	11661.64	348.5478	528.7994	259.1559	41.39593
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	120	120	120	120	120

Source: Author's computation 2016

Table 1 gives the mean, standard deviation, skewness, kurtosis, Jarque-Bera statistics and also *this p-value.* The statistics in Table 1 shows that the conditional variance for stock prices and macroeconomic fundamentals showcases a strong positive skewness and high levels of kurtosis. Observably from the results, some noted that the high values of the standard deviation of the stock index (INDEX) regarding mean is a reflection there is high volatility at the stock market. Evidence from the Jarque-Bera statistics and their corresponding *P*-values, it is glaring that the null hypothesis of normal distribution is rejected at 5% significance level for the variables. Meaning that, the Jarque-Bera probability for the variables shows that the error terms are normally distributed.

4.2. Unit Root Test Analysis

An important concern in time series data analysis is to determine whether a series is stationary (contain no unit root) or not stationary (contains a unit root). Generally, time series data are often assumed to be non-stationary and it was necessary to perform a pretest to ensure that all the variables were stationary to avoid the problem of spurious regression as put by (Granger, 2001)

Table 2: Result of Unit Root Test

Augmented Dickey-Fuller (ADF) Test				**Philip Perron (PP)Test**		
Variables	Level	1st Diff	Status	Level	1st Diff	Status
INDEX	-1.436668	-7.247025	I(1)	-5.494992	-25.29696	I(1)
CPI	-0.028636	-3.427049	I(1)	0.846864	-3.605927	I(1)
EXCH	-0.188166	-5.779912	I(1)	-0.177687	-9.804821	I(1)
M2	-0.177522	-2.367993	I(1)	0.566526	-5.861294	I(1)
GDP	-0.144286	-3.486673	I(1)	0.498636	-7.738785	I(1)

Source: Author's computation 2016

Both the Augmented Dickey Fuller (ADF) and Philip Perron (PP) have been utilized. Evidently, the series were difference stationary at level. However, they became stationary after first differencing as shown in Table 2 above. The results shows that all variables under consideration are integrated of order one I(*I*). The implication of the result is that the null hypothesis of non-stationary was rejected at 5% level of significance at the merit of the alternative hypothesis. Therefore, we can go ahead with the co-integration test.

4.3 Co-integration Test

Theoretically, it is believed that when a linear combination of variables that are I*(1)* produces a stationary series, then the variables may to be co-integrated. This means that a long-run linear relationship may exist among them, which connotes that they may wander from one another in the short-run but in the long-run they will co-move. To establish whether long-run relationship exists among the variables, co-integration tests are conducted by using the multivariate procedure developed by Johansen (1988) and Johansen and Juselius (1990). The nature of the estimator means that the estimates are robust to simultaneity bias, and it is robust to departure from normality (Johansen, 1995). Johansen method detects several co-integrating vectors in non-stationary time series. It allows for hypothesis testing regarding the elements of co-integrating vectors and loading matrix. The result of the conducted Johansen tests for co-integration amongst the variables is specified in the table below:

T**able3: Summary of Co-integration Estimate**

TRACE TEST				Maximum EigenValue Test			
Null Hypothesis	Alternative Hypothesis	Statistics	99% Critical Value	Null Hypothesis	Alternative Hypothesis	Statistics	95% Critical Value
r=0	r≥1	190.73	66.52	r=0	r≥1	0.61	59.46
r≤1	r≥2	79.92	45.58	r≤1	r≥2	0.39	39.89
r≤2	r≥3	22.46	29.75	r≤2	r≥3	0.14	24.31
r≤3	r≥4	4.32	16.31	r≤3	r≥4	0.03	12.53
r≤4	r≥5	0.01	6.51	r≤4	r≥5	0.00	3.84

Source: Author's computation 2016

The results of the co-integration test indicate two co-integrating vectors. Using the trace likelihood ratio, the results point out that the null hypothesis of no co-integration among the variables is rejected in favour of the alternative hypothesis of up to two co-integrating equations at 5% significant level because their values exceeded the critical values. This means there are two integrating equations, hence indicating a long-run linear relationship among the variables of interest and that the coefficients of estimated regression can be taken as equilibrium values.

4.4 Correlation Analysis Results

The correlation between the macroeconomic fundamentals are presented in the below Table 4. This problem exists when there is a high correlation between any two independent variables in a model. To ascertain multicollinearity among two or more explanatory variables the suggested rule of the thumb is that the two regressors must have a high value of pair wise correlation, over 0.8 making multicollinearity to pose serious problem as suggested by (Adam and Twenoboah, 2008). It is generally suggested that if VIF is greater than 5 then there is the likelihood the multicollinearity exist. As seen from table 5 below, we discover that all the correlation values are lower than 0.8. It therefore implies there is no multicollinearity among the variables under consideration.

Table 4: Result of Correlation matrix

	INDEX	EXCH	CPI	M2	GDP
INDEX	1.000000	0.214518	0.191124	0.216530	0.311194
EXCH	0.214518	1.000000	-0.007360	-0.013196	0.218783
CPI	0.191124	-0.007360	1.000000	0.967146	0.683005
M2	0.216530	-0.013196	0.967146	1.000000	0.768342
GDP	0.311194	0.218783	0.683005	0.768342	1.000000

Source: Author's computation 2016

From the correlation matrix above, all the correlation values are lower than 0.8. It therefore implies there is no multicolinearity among the variables under consideration.

4.5 Residual Diagnostics Test

To make that the residuals are white noise, we must perform some residual test. Pinpoint that the residuals contain no systematic information, because if does, it is an implication this information is not included in the model.

4.5.1 Testing For Heteroscedasticity

This is one task that must be performed before applying the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) methodology. This is done by first ascertaining the residuals which is evidence for heteroscedasticity. This is verified through applying the Lagrange Multiplier (LM) test for ARCH effects proposed by Engle (1982).

Table 5: Testing for Heteroscedasticity

ARCH – LM Test:	Value	Probability
F-statistic	0.029917	0.970534
Obs*R-squared	0.061363	0.969785
5% Critical Value	2.73	

Source: Author's computation 2016

The ARCH-LM test results in the table above provide a strong evidence for accepting the null hypothesis for all lags included. Accepting is an indication of no ARCH effects in the residuals series and therefore the variance of the return series of all share index is constant for all periods specified H_0. From the heteroscedasticity ARCH-LM test obtained, there is evidence to conclude there is no ARCH effect on the variables, even at 5% significant level.

The probability values of the Q-statistics for all lags are less than 0.05 making the ARCH and GARCH coefficients to be significant in all periods. The null hypothesis there is no ARCH effect is accepted confirming there is no serial correlation in the residuals of the estimated models at 5% significance level. Also, few points on the QQ-plots of the residuals were all within the straight line, especially at the extreme maintaining the consensus that the standardized residuals are normally distributed.

4.6 The EGARCH Model

Table 6: The Estimation results of EGARCH model and Diagnosis

Variables	Coefficient	z-statistic	Prob.
Mean Equation			
SQR(GARCH)	0.952916	0.050349	0.9598
C	-119324.1	-0.102717	0.9182
CPI	-153.5959	-0.044492	0.9645
EXCH	485.2836	0.333420	0.7388
M2	1.143345	0.062222	0.9504
GDP	0.584502	0.056845	0.9547
Variance Equation			
C	22.30955	0.585287	0.5584
|RES|/SQR[GARCH](1)	0.015429	0.029296	0.5584
RES/SQR[GARCH](1)	0.022518	0.041854	0.9666
CPI	-0.008573	-0.127888	0.8982
EXCH	-0.001862	-0.130370	0.8963
M2	1.58E-05	0.037686	0.9699
GDP	1.66E-05	0.360614	0.7184
Diagnosis			
AIC	25.22899		
SC	25.55419		

Source: Author's computation 2016

The mean equation of the EGARCH (1,1) model estimated for the Nigerian stock market all share index indicates that the estimated coefficients of the variables. For instance, CPI exhibited a negative sign which also conforms to the apriori expectation. The asymmetric effect captured by the parameter estimates of the variables is statistically non-significant with negative sign. The negative shock in the results portrays the possibility of a higher next period conditional variance than positive shocks of the same sign as buttressed by (Ahmed and Suleiman, 2011), which imply that the existence of leverage effect is observed in returns/prices of the all share index in the Nigerian stock market.

Evidently, as seen in the variance equation the first three coefficients that is; the constant (22.30955), GARCH (0.015429) and GARCH term

(0.022518) for GARCH (1,1) are highly significant and with expected sign for all periods. The significance indicates that the lagged conditional variance and squared disturbance affects the conditional variance; this means that news about volatility from the previous periods has an explanatory power on volatility. The two estimated GARCH term and GARCH coefficients (persistence coefficients) in the estimation process of the variance is less than one, which must have a mean reverting variance process. The implication of the is that large changes in returns are followed by large changes in these variables and vice versa i.e. small changes are followed by small changes, which will therefore, confirm that volatility clustering is observed in the Nigerian stock market all share index.

The estimated coefficient of the variables EXCH and (M2) in the mean equation are positive while the coefficients of variables like, M2 and GDP in the variance equation showed positive signs indicating that the mean of returns/prices sequence of the variable considerably depends on past innovation and past conditional variance. This result shows that as volatility increases, the all share index correspondingly increase by a factor of 485.2836, 1.143345 and 1.58E-05 and 1.66E-05, respectively. These results follow the theory of a positive risk premium on stock indices which states that the higher returns are expected for asset with higher level of risk.

Based on RMSE and Theil, EGARCH (1, 1) model result indicates least forecast error. This result agrees with Eric (2008) who noted that the covariance proportion of Theil statistics which suggests that 0.03% remaining unsystematic forecasting error was accounted for. It is worthy to note that the closeness of the forecast evaluation statistics in RMSE and Theil coefficient justifies the adequacy of the effect of the macroeconomic variables on stock market index model under consideration.

4.7 DISCUSSION OF THE FINDINGS

The major focus of this study is to evaluate the influence of macroeconomic fundamentals on stock markets prices in Nigeria. The results of the descriptive statistics show that all the variables have positive mean values. The estimation equally indicates that the Jarque-Bera probability for the variables shows that the error terms are normally distributed. Also the Unit root test conducted on the variables showed that they were all stationary after first difference in both Phillip Perron and ADF unit root test. This means they are integrated of order one, I (1) both in ADF and Philip Peron unit root tests procedures. The co-integration test result obtained indicates there are two co-

integrating vectors. Using the trace likelihood ratio, the results point out that the null hypothesis of no co-integration among the variables is rejected in favour of the alternative hypotheses up to two co-integrating equations at 5% significant level because their values exceeded the critical values. On the correlation test conducted, the values obtained are lower than 0.8 implying there is no multicolinearity among the variables under consideration.

The ARCH-LM test conducted provided strong evidence for accepting the null hypothesis for all lags included. Accepting is an indication of no ARCH effects in the residuals series and therefore the variance of the stock return/stock price series of all share index is constant for all periods. This was confirmed by the correlogram test conducted which showed that few points on the QQ-plots of the residuals were all within the straight line, especially at the extreme maintaining the consensus that the standardized residuals are normally distributed. Finally, the estimated EGARCH (1,1) model result on the Nigerian stock market all share index indicates that the estimated coefficients of the variables, CPI, exhibited negative sign. The asymmetric effect captured by the parameter estimates of the variables, is statistically non-significant with negative sign. The result negative shocks in the results indicates a higher next period conditional variance than positive shocks of the same sign (Ahmed and Suleiman, 2011), which imply that the existence of leverage effect is observed in returns of the all share index of the Nigerian stock market. Finally, the estimated EGARCH (1,1) model result on the Nigerian stock market all share index indicates that the estimated coefficients of the variables, CPI, exhibited negative sign. The asymmetric effect captured by the parameter estimates of the variables is statistically non-significant with negative sign. The result indicate that negative shocks imply a higher next period conditional variance than positive shocks of the same sign (Ahmed and Suleiman, 2011), which imply that the existence of leverage effect is observed in returns of the all share index of the Nigerian stock market.

5.0. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary and Conclusion

This study investigates the influence of macroeconomic fundamentals on stock prices in Nigeria. This is because the stock market has been viewed as a leading indicator that can catalyze an economy due to its inherent gains in the modern age. The study checked for the time series properties and the co-integration test of the variables utilized. The results of the unit root test revealed that all the variables became stationary after first differencing

indicating that were integrated of order one I(*1*). On other hand, by employing co-integration test, it has showed that long term linear relationship exists between stock prices and macroeconomic fundamentals in Nigeria. Evidence from the descriptive statistics showed that all variables have positive mean values. The results equally indicated that the stock market index skewness coefficient is far from zero and kurtosis coefficient is leptokurtic. The output indicates that the Jarque-Bera probability for the variables shows that the error terms are normally distributed.

The correlation matrix shows there is no multicollinearity among the variables under consideration. The heteroskedasticity test result conducted indicates that the Lagrange Multiplier (LM) test for ARCH effects shows there is evidence to conclude there is no presence of ARCH effect on the variables under consideration even at 5% significant level. Also, serial correlation test results conducted using Q-Statistics (Correllogram of Residuals) show that the null hypothesis there is no ARCH effect is accepted confirming there is no serial correlation in the residuals of the estimated models at 5% significance level. Interestingly, it was discovered that few points on the QQ-plots of the residuals were all within the straight line, especially at the extreme maintaining the consensus that the standardized residuals are normally distributed. Similarly, from the EGARCH estimates it was discovered from the mean equation that the coefficient of CPI is negatively related to the stock market returns.

It was further discovered that the asymmetric effect captured by the parameter estimates of the variables is not statistically significant with the negative sign. In consonance, to the above, it was discovered from the variance equation that the first three coefficients that is constant, GARCH term and GARCH (1,1) were highly significant and long term relationship among the macroeconomic fundamentals and stock prices with their expected signs for all periods. Meaning that EGARCH (1,1) has mitigated for the heteroskedasticity in the data and hence provide the relationship even when there is evidence there is clustering volatility among the variables. In the same vein, the study revealed that the estimated GARCH and GARCH coefficient (persistence coefficient) in the estimated variance is less than one satisfying the requirement for mean reverting variance process. It was equally found that EXCH, (M2) and GDP were positively correlated to stock prices which contradicted the study of (Mukherjee and Naka 1995; Liu and Shrestha, 2008). Meaning that, EXCH, (M2) and GDP growth rate respectively are economic stimulus and are indirectly associated with CPI. Particularly, theories and hypotheses from past researches suggested that an increase in money supply induces excess demand

from investors for stock and hence the prices of stocks will increase and vice versa. In the same vein implying that the mean of return sequence of the variables invariably depends on past innovation and past conditional variance. However, this result follows the theory of a positive risk premium on stock indices which states that the higher returns are expected for asset with higher level of risk. This confirms that the Nigerian stock market prices are reactive to the changes in macroeconomic variables eventually regardless of high volatility and immaturity. Therefore, the study asserts that stock prices at a specific point in time are not only a function of the macroeconomic variable at that point in time but also to the past and current occurrences. For instance, in Nigeria the current economic situation like terrorism, vandalism etc. in the country has typically affected the economic activities trading off the confidence of foreign and potential domestic investors from the stock market. The study concludes that macroeconomic fundamental are responsible in explaining changes in stock market prices in Nigeria.

5.2 Recommendation of the study

Following from the above findings the study makes the under-listed recommendations:

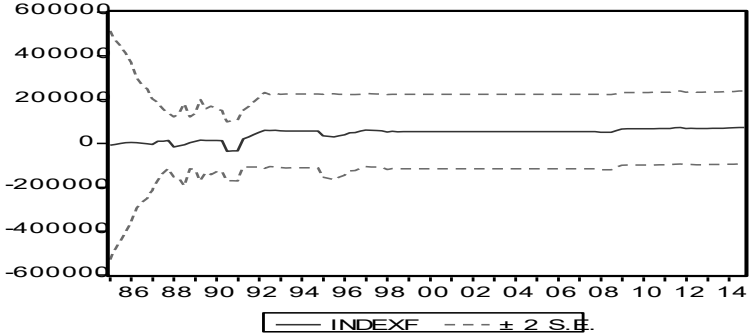
The government should put in place policy measures to ensure that the exchange rate is stabilized. This is because empirical evidence from studies has shown that exchange rate affects stock returns.

The Nigerian government should put in place measures that will curtail depreciation of the currency. The results of the study findings have showed that a shock to exchange rates although it showed a positive response to stock returns.

The government should seek to minimize fluctuations on the variables; exchange rate, GDP growth, and the consumer price index.

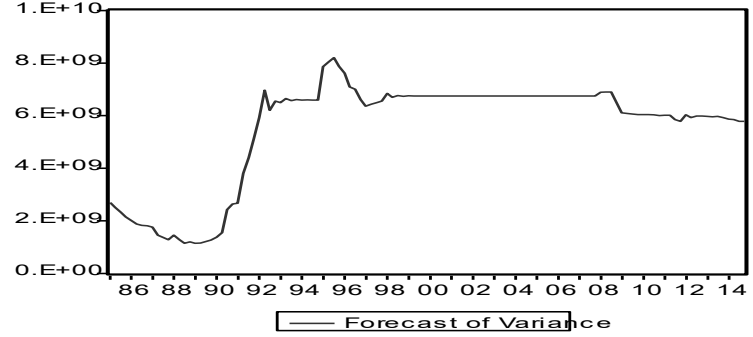
High frequency data such as monthly data or daily data are suggested to be used in future researches. According to Liu (2006), high frequency data are more useful in estimation time series data. Therefore, high frequency data can obtain the more reliable result of their search.

This research is using time series data set and this data set has always been used by many previous researches. However, time series data has some disadvantages that may make the result becomes bias. Other type of data such as panel data are encouraged to be employed in future researches instead of using time series data as time series data may cause inconsistent result.



Forecast: INDEXF
Actual: INDEX
Forecast sample: 1985:1 2014:4
Included observations: 120

Root Mean Squared Error	70154.99
Mean Absolute Error	34514.39
Mean Abs. Percent Error	585.7280
Theil Inequality Coefficient	0.506089
Bias Proportion	0.000000
Variance Proportion	0.486101
Covariance Proportion	0.513899



Source: Author's computation

REFERENCES

Adam, A. M. and Tweneboah, G. (2008). Macroeconomic factors and stock market movement: Evidence from Ghana. *Munich Personal RePEc Archive, No. 14079*.

Ahmad, A. U., Abdullah, A., Abdullahi, A. T., Aziz, U. A. & Muhammad (2015). Stock Market Returns and Macroeconomic Variables in Nigeria: Testing for Dynamic Linkages with a Structural Break, *Scholars Journal of Economics, Business and Management,* ISSN 2348-8875, Vol. 2 No 8A, pages 816-828

Akinifesi, O. (1987). The Role and Performance of the Capital market in Adedotun Philips and Eddy Ndekwu (eds) Economic Policy and Development in Nigeria NISER, Ibadan Nigeria.

Akinlo, O. O. (2015). Impact of foreign exchange reserves on Nigerian Stock Exchange, *International Journal of Business and Finance Research,* ISSN: 1931-0269, Vol. 9, No. 2, pages 69-76.

Alatiqi, S. and Fazel, S. (2008), "Can Money Supply Predict Stock Prices? *Journal for Economic Educators*, 8(2), fall 2008. 222-227.

Bhattacharya, B. & Mookherjee, J. (2001).Causal relationship between and exchange rate, foreign exchange reserves, value of trade balance and stock market: Case study of India. *Working paper*, Jadavpur University Department of Economics, Kolkata, India. Retrievedfromhttp://www.igidr.ac.in/money/mfc_5/basabi.pdf

Chen, N. F., Roll, R. and Ross, S. A (1986). Economic forces and the stock market. *Journal of Business, 59,* 383-403. Retrieved July 23, 2011, from http://www.anderson.umich.edu.

Dagadu, S. (2010). The effect of Macroeconomic variables on stock market performance: A case study of Ghana. *IMF Country Report No.9/256.* Retrieved June 5, 2011, from www.scribd.com/doc/46104408

Doong, Y., Shuh-Chyi, Z., Yang, Y. Z., Sheng-Yung, W., Wang, T. Z. and Alan, T. (2005), "The Dynamic Relationship and Pricing of Stocks and Exchange Rates" Empirical Evidence from Asia Emerging Markets. *Journal of American Academy of Business, Cambridge 7*, 118-123.

Duca, G. (2007). The Relationship between the Stock Market and the Economy: Experience from International Financial Markets. *The Bank of Valletta Review,* No. 36, pp. 1-12.

Fama, E. F. (1970). Efficient Capital Markets: A review of theory and empirical work, *Journal of Finance*, 25: 383-417.

Fama, F. and Schwert. (1977). Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review*. 71(4) 545-565

Firth, M. (1979), The Relationship Between Stock Market Returns and Rates of Inflation", *The Journal of Finance*, Vol. 34, No. 3, pp. 743-749 [Online] Available at: http://www.jstor.org/stable/2327440 [Accessed 28 June 2009].

Gay, R. D. (2008). Effect of macroeconomic variables on stock market returns for four emerging economies: Brazil, Russia, India, and China. *International Business andEconomics Research Journal*, *7*(3), 01-08.

Geetha, C., Mohidin, R., Chandran, V.V., and Chong, V. (2011), The Relationship between Inflation and Stock Market: Evidence from Malaysia, United States and China, *International Journal of Economics and Management Sciences,* Vol. 1(2), pp. 01-16.

Gjerde, O. and Saettem, F. (1999), Causal Relations Among Stock Returns and Macroeconomic Variables in a Small, Open Economy, *Journal of International Financial Markets, Institutions and Money*, 9, 61–74.

Goswami, G. and Jung, S. C. (1997). Stock Market and Economic Forces: Evidence from Korea. *IMF Working Paper*. From <http://papers.ssrn.com/sol3/Delivery.cfm? abstractid=1937914>
(Retrieved on April 6, 2012)

Granger, C. W. J. and Newbold, P. (1974),"Spurious regressions in econometrics", *Journal of Econometrics* vol.2 (2): pp 111–120.

Grossman, S. J. and Shiller, R. J. (1981), The Determinants of The Variability of Stock Market Price, *The American Economic Review* 71(2), :.222-227.

Habibullah, M. and Baharumshah A. Z. (1996), Money, Output and Stock Prices in Malaysia: An Application of the Cointegration Tests. *International Economics Journal* 10(2):121-130.

Hamburger, M. J. and Kochi, L. A. (1972). Money and Stock Prices: The Channel of Influence. *Journal of Finance,* December, pp 1056-1066.

Ibrahim, M. H. (1999). Macroeconomic Variables and Stock Prices in Malaysia: An Empirical Analysis. *Asian Economic Journal*, Vol. 13, No. 2, pp. 219-231.

Johansen, S. and Juselius, K. (1990). Maximum Likelihood Estimation and inference on
Cointegration with application to the Demand for Money, *Oxford Bulletin of Economics and Statistics, 52 (2):* 169-210.

Johansen, S. and Juselius, K. (1992) Testing Structural Hypotheses in Multivariate Cointegration Analysis of the PPP and UIP for UK. *Journal of Econometrics, 53:* 211 – 244.

Kaul, G. (1987), Stock Returns and Inflation: The Role of the Monetary Sector, *Journal of Financial Economics*, Vol, 18, No.2, pp. 253-276.

Khan, K. & Ahmed, I. (2015). Impact of Stock Prices on Macroeconomic Variables: Evidence from Pakistan, *KASBIT Business Journal (KBJ),* Vol. 8, No.1, pages 42-59.

Khan, M. S. (2014). Macroeconomic Variables & its Impact on KSE 100 Index, *Universal Journal of Accounting and Finance*, Vol. 2 Issue 2, pages 33-39,

Khan, W. A., Javed, M. A., Shahzad, N., Sheikh, Q., Saddique, S., Riaz, M., & Batool, S. (2014). Impact of Macroeconomics variable on the Stock Market index; A Study from Pakistan. *International Journal of Accounting and Financial Reporting*, *4*(2), Pages-258.

Linter, C. J. (1973). In: *Quality control in the Pharmaceutical Industry* (Cooper, M.S., Ed.), Volt, Academic Press, New York, pp 191-192.

Liu, L. Li. Y. and Hu, X. J (2006). Relationship between economy and stock market in China. *Special Zone Economy,* 76-77. Retrieved June 14, 2011, from http://www.kcmi.re.kr.

Liu, M. and Shrestha, K. (2008). Analysis of the long term relationship between Macro- economic variables and the Chinese stock market using heteroscedastic cointegration. *Journal of Managerial Finance,* 34(11):744-755.

Maysami, R. C., Howe, L. C., and Hamzah, M. A. (2004), relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore‟s All-S Sector Indices‟, *Journal Pengurusan* Vol. 24, pp. 47-77 [Online] Available at: http://pkukmweb.ukm.my/~penerbit/jurnal_pdf/Jp24-03.pdf [Accessed 9 February 2009].

Maysami, R. C. & Koh, T. S. (2000). A Vector Error Correction Model of the Singapore Stock Market. *International Review of Economics and Finance, 9,* 79–96. Monthly Reviews of Dhaka Stock Exchange, January 2000-Feb 2007.

Mohammad, B. A. (2011) "Co-integration relation between Macroeconomic Variables and stock return: Evidence from Dhaka Stock Exchange (DSE)", *International Journal of Business and Commerce Vol. 1 No.2, pp 25-38.*

Mohanamani and Sivagnanasithi (2014). Indian Stock Market and Aggregate Macroeconomic Variables: Time Series Analysis. *Journal of Economics and Finance (IOSR-JEF)., e- ISSN: 2321-5933, p-ISSN: 2321-2925. 3(6), pp 68-74*

Mukherjee, T. K. and Naka, A. (1995) Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An Application of vector error correction model. *The Journal of Financial Research, 18(2),* 223-237.

Nelson, D. B. (1991), Conditional Heteroscedasticity in Asset Returns*: A New Approach*.*Econometrica.* 59, 347–370.

Nijam, HM., Ismail, SMM. & Musthafa, AMM. (2015). The Impact of Macroeconomic Variables on Stock Market Performance; Evidence from Sri

Lanka, *Journal of Emerging Trends in Economics and Management Sciences,* (ISSN: 2141-7024), Vol. 6, Issue 2, pages 151-157.

Nkechukwu, G., Onyeagba, J. & Okoh, J. (2013). Macroeconomic Variables and Stock Market Prices in Nigeria: A Co-integration and Vector Error Correction Model Tests, *International Journal of Science and Research (IJSR),* ISSN (Online): 2319-7064, Volume 4 Issue 6, pages 717-724. *of Finance*, 25: 383-417.

Ogiji, F. O. (2013). An empirical analysis of the effect of broad money supply on the stock market returns in Nigeria. *International Journal for Management Sciences and Technology*, 1(6), 1-13. Retrieved from www.ijmst.com

Osamwonyi, I. O. & Michael, C. I. (2014). The impact of macroeconomic variables on the profitability of listed commercial banks in Nigeria, *European Journal of Accounting Auditing and Finance Research,* Vol.2, No.10, pages 85-95.

Osamwonyi, I.O. (2003). Forecasting as a Tool for Securities Analysis, A Paper Presented at a Three-day Workshop on Introduction to Securities Analysis. Organized by Securities and Exchange Commission, Lagos, August 17th.

Ozbay, E. (2009), "The Relationship between Stock Returns and Macroeconomic Factors: Evidence from Turkey", 1-72, M.Sc Thesis on Financial Analysis and Fund Management Exeter University Retrieved from http://www.gov.tr/displayfile&pageid=61&fn=61.pdf

R. B. Khodaparasti (2014). The role of macroeconomic variables in the stock market in Iran, *Polish Journal of Management Studies,* Vol. 10, No 02, pages 54-64.

Ross, S. A. (1976). The Arbitrage Theory of Capital Asset Pricing, *Journal of Economic Theory,*
13: 341-360.

Sarbapriya, Ray (2012) "Foreign Exchange Reserve and its Impact on Stock Market Capitalization: Evidence from India", *Research on Humanities and Social Sciences,* Vol.2, No.2, 2012.

Sellin, P. (2001), "Monetary Policy and the Stock Market: Theory and Empirical Evidence" *Journal of Economic Surveys,* 15(4) pp 491 – 541.

Singh, P. (2014).Indian stock market and macroeconomic factors in scenario, *International Journal of Research in Business Management,* ISSN(P): 2347-4572, Vol. 2, Issue 11, pages 43-53.

Smith, G. (1990). *Investments*, Illinois & London: Glenview

Suliaman, D. M., Hussain, A. and Ali, A. (2009). Impact of macroeconomic variables on stock prices: Empirical evidence of KSE (Karachi Stock Exchange). *European Journal of Scientific Research, 38(1),* 96-103. Retrieved June 5, 2011, from http://www.eurojournals.com.

Uddin, M. G. S. and Alam, M. M. (2007). The Impacts of Interest Rate on Stock Market: Empirical Evidence from Dhaka Stock Exchange. *South Asian Journal of Management and Sciences*, 1(2), 123-132

Venkatraja, B. (2014). Impact of Macroeconomic Variables on Stock Market Performance in India: An Empirical Analysis, *International Journal of Business Quantitative Economics and Applied Management Research,* Vol.1, Issue 6, pages 71-85.

Wang, M. L., Wang, C. P. and Huang, T. Y. (2010). "Relationships among Oil Price, Gold Price, Exchange Rate and International Stock Markets, *Journal of Finance and Economics*, ISSN 1450-2887 Issue 47.

Wasseja, M. M., Njoroge, E. & Mwenda, S. N. (2015). Investigation of the Granger Causal Relationship between Macroeconomic Variables and Stock Prices in Kenya, *International Journal of Business and Economics Research,* ISSN: 2328-7543, Vol. 4, No. 3, pages 98-108.

Yunus, M. M., Mahyideen, J. M. & Saidon, R. (2014).Influences of macroeconomic variables on stock prices in Malaysia, *International Conference on Postgraduate Research,* (e-ISBN 978-983-3048-98-4), pages No. 399-416.