

**IMPACT OF MACROECONOMIC VARIABLES ON STOCK RETURNS IN NIGERIA
2000 - 2012**

BY

Maryam Yusuf ALIYU

M.Sc / SOC-SCI/8233/2009-2010

**A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,
AHMADU BELLO UNIVERSITY, ZARIA**

**IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS FOR THE AWARD OF A
MASTER OF SCIENCE IN ECONOMICS**

**DEPARTMENT OF ECONOMICS
FACULTY OF SOCIAL SCIENCES
AHMADU BELLO UNIVERSITY, ZARIA
NIGERIA**

MAY, 2015.

DECLARATION

I declare that the work in this thesis entitled “*IMPACT OF MACROECONOMIC VARIABLES ON STOCK RETURNS IN NIGERIA, 2000-2012*” has been carried out by me in the Department of Economics. The information sourced from the literature has been duly acknowledged in the text and in the list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

Maryam Yusuf ALIYU

Name of Student

Signature/Date

CERTIFICATION

This thesis entitled “*IMPACT OF MACROECONOMIC VARIABLES ON STOCK RETURNS IN NIGERIA, 2000-2012*” by Maryam Yusuf, Aliyu meets the regulations governing the award of degree of Master of Science (Economics) of Ahmadu Bello University, Zaria and is approved for its contributions to knowledge and literary presentation.

Dr. P. P. Njiforti
Chairman Supervisory Committee

Date

Dr. A. R. Sanusi
Member Supervisory Committee

Date

Dr. Salamatu I, Isah
Head of Department
Dept. of Economics,
Ahmadu Bello University, Zaria

Date

Prof. A. Z. Hassan
Dean Postgraduate School

Date

ACKNOWLEDGEMENTS

This work would not have been complete without acknowledging the effort and support of my supervisors, Dr. P.P. Njiforti and Dr. A. R. Sanusi. I sincerely appreciate the dedication of their time despite their tight schedules and contributions. I am very grateful.

My special appreciation goes to my entire family members for their moral and financial support given to me during the course of this programme, especially Mr and Mrs A. Yusuf.

I appreciate the contributions of my colleagues, friends and the entire staff Economics Department, A.B.U, Zaria.

All praises be to Allah (SWT) for his grace, protection and all dimensional support. Allhamdulillah.

ABSTRACT

The study examined the impact of Macroeconomic variables on Stock returns in the Nigerian capital market. The study used time series data spanning a period from 2000 to 2012 and the domestic variables employed were Money supply, Exchange rate, Nigeria treasury bills rate, inflation rate, and US Stock price as a proxy for international influence on stock returns in Nigeria. The Augmented Dickey-Fuller and Philip-Perron tests were used to determine the stochastic properties of the series. Within the theoretical framework of the Arbitrage Pricing Theory, a stationary VAR model was estimated and used to analyze the short run impact of selected macroeconomic variables using data for the period. The results show that there was marginal influence of the domestic variables. Changes in the US Stock prices have a positive and quantitatively larger effect on stock returns. In addition, the effect of changes in the exchange rate contributes a high of 5.6 percent change in stock return which is larger than that of all the other domestic variables. This implies that the Nigerian stock market is prone to the well-known contagion effect of global financial market. The study recommends that monetary authorities should be careful with the current efforts at internationalisation of the Nigerian Stock Market.

TABLE OF CONTENTS

TITILE PAGE	Error! Bookmark not defined.
DECLARATION	ii
CERTIFICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLE	viii
LIST OF FIGURES	ix
CHAPTER ONE: GENERAL INTRODUCTION	
1.1 Background of the Study	1
1.2 Statement of Research Problem	3
1.3 Research Questions	5
1.4 Objective of the Study	5
1.5 Research Hypothesis	5
1.6 Significance of the Study	6
1.7 Scope of the Study	7
CHAPTER TWO: REVIEW OF LITERATURE	
2.1 Conceptual Literature.....	8
2.2 Theoretical Literature.....	14
2.2.1 Capital Asset Pricing Theory	14
2.2.2 Discounted Cash Flow Model (DCF)	15
2.2.3 Arbitrage Pricing Theory (APT)	16
2.2.4 Comparism between CAPM and Arbitrage Pricing Theory	17
2.3 Empirical Literature	19
2.3.1 Empirical Studies From Developed Economies	19
2.3.2 Empirical Studies from Emerging Economies	21
2.3.3 Empirical Studies from Nigeria.....	25
CHAPTER THREE: RESEARCH METHODOLOGY	
3.1 Data Description	29
3.2 Sources of Data	29

3.3	Model Specification	29
3.4	Estimation and Evaluation Procedure	30
3.4.1	Unit Root Test	30
3.4.2	Cointegration Analysis	30
3.4.3	Error Correction Mechanism.....	32
3.5	Apriori Expectation.....	32
CHAPTER FOUR: PRESENTATION OF RESULT AND ANALYSIS		
4.1	Introduction.....	33
4.2	Unit Root Test: Test For Stationary.....	35
4.3	Cointegration Results.....	36
4.4	Vector Error Correction (VEC) Model	37
4.5	VAR Model.....	39
4.5. 1	Stability of the VAR	40
4.5 2	Impulse Response Function	40
4.5.2	Variance Decomposition.....	47
4.6	Causality Test Result	49
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION(S)		
5.1	Summary	51
5.3	Recommendations.....	53
REFERENCES		54
APPENDICES		59

LIST OF TABLE

Table 4.1 Descriptive Statistics.....	34
Table 4.2: Unit Root Test.....	35
Table 4.3 A. Trace Rank Test	36
Table 4.3 B: The Maximum Eigen Test.....	37
Table 4.4: Vector Error Correction Mechanism	39
Table 4.6: Summary Of Causality Test Result	50

LIST OF FIGURES

Fig 4.1: Stability Test	40
Fig 4.2: Impulse Response Function	46

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background of the Study

Generally, establishing the lead-lag relationship between macroeconomic variables and stock returns is highly important both in developed and emerging stock exchange markets. Firstly, conducive macroeconomic environments stimulate investment and capital formation which is crucial to equity market development. Secondly, a significant time lagged effects of macroeconomic variables on stock prices indicate information inefficiency of the stock market. This means that individual investors can earn abnormal profit by exploiting past macroeconomic information. The presence of this exploitable opportunity would then seriously destabilize the market ability to efficiently allocate scarce resource (Mohammed, 2011). Conversely, the effect of stock prices on macroeconomic variables imply that stock market fluctuations can anticipate future macroeconomic conditions therefore, stock market indices may be employed as a leading indicator in formulating current economic stabilization policies (Mukhreje & Naka, 1995).

The changes in stock prices and the trend of changes have always been of interest in the capital market stability and strategies adopted by investors Wang (2010). The use of publicly information about macroeconomic fundamentals makes stock returns partially predictable. Understanding why prices move up and down is of crucial importance to investors and policy makers and from previous studies there are various variables that drive stock returns, although, the precise cause and effect between macroeconomic variables and stock prices is debatable.

The Nigerian stock market (NSE) ¹ has seen drastic volatility in its performance such that for example between March 2007 and July 2011, the NSE market capitalization has recorded a variation from a high of 12.6 trillion naira to a low of 7.6 trillion naira with All- share index from 66,371 points to 23,826 points. These changes in the stock prices and what causes the changes are imperative, for capital markets are sources of long term funds for firms and government, which stimulates growth and development in any economy. The capital markets are interlinked to other markets(money markets, exchange rate markets, commodity markets), through gradual removal of capital inflow barriers, removal of interest rate ceiling, implementation of more flexible exchange rate mechanism, and emphasis on price stability in developed as well as transition economies has raised a great concern to both academicians and policy makers.

Consequently theories have emerged to relate the activities of the capital market to exogenous factors. Efficient Market Hypothesis (EMH) postulates that all publicly available information is embedded in the current share price where by an investor cannot influence the price or return of the market. Some empirical works distinguish the markets in to strong, semi-strong and weak hypothesis depending on the level of absorption of information to the stock markets. The factor base model Arbitrage Pricing Theory developed by Ross (1979) elucidated that all factors that affect future cash flow and risks are determinants of stocks returns, thus this makes the theory more general than other theories.

The Arbitrage Pricing Theory (APT) ¹ is often used to describe the data better than competing models, the empirical success of APT may as well be due test employed Some of the questions

¹ Arbitrage Pricing Theory (APT) is a general theory of asset pricing that holds that the expected return of a financial asset can be modeled as a linear function of various macro-economic factors or theoretical market indices, where sensitivity to changes in each factor is represented by a factor-specific beta coefficient. The model-derived rate of return will then be used to price the asset correctly - the asset price should equal the expected end of period price discounted at the rate implied by the model. If the price diverges, arbitrage should bring it back into line

that comes to our mind which factor capture the data best, what is the economic interpretation of the factors, what are the different factors that researchers have reported? As long as any test of the APT is a joint test that the factors are correctly identified and the linear pricing relation holds, a host of competing theories exist side by side under the APT umbrella. Each fails to reject the APT but has its own factor identification procedure. The number of factors as well the methods of factors construction is exploding. The multiplicity of competing factor models indicates ignorance of the true factor structure of the asset returns and suggests a rich and challenging research agenda. Researchers who introduce factors tend to report results supporting the APT with their factors and test portfolios.

Several attempts have been made to identify or study the factors that affect stock returns using the Arbitrage Pricing Theory (APT) model. Some researchers have tried to determine the correlation between selected factors (internal & external market and non-market, economic and non-economic factors) and asset returns. The outcomes of the studies vary depending on the scope of study, the assets and factors to be determined. In the course of literature review, empirical evidence available for Nigeria concerning the effect of macroeconomic factors on stock returns for firms trading on NSE were very sparse, hence the motivation for the study. The study is purposed to give an insight into investment and operation strategies for players in the Nigerian Financial Market.

1.2 Statement of Research Problem

There is consensus among macroeconomists and finance theorists that stock market prices are driven by macroeconomic variables- the so called fundamentals in the economy. Moreover it is also agreed that the linkage is two ways, that is, feed-back exists between the stock market and

the real activity. In finance, Arbitrage Pricing Theory suggests that systematic forces that influence stock returns are those macroeconomic variables that change the expected cash flow and the discount factors.

A gap exists between the theoretical exclusive importance of systematic variables and our complete ignorance of their identity. In Nigeria, the influence of some macroeconomic variables is not fully reflecting in the activities of the Nigerian stock exchange especially since the 2008 global economic meltdown that affected stock markets all around the globe. The Monetary authority has tried to peg all the monetary variables (MPR rates, exchange rate and Money supply) so as to influence the financial markets but there has been no significant effect on the stock exchange market. For instance, exchange rate was relatively stable between 2004 and 2008. This reflect positively on the All Share index as it rises to 27,730.80 points in 2004 from 13,298 points in 2003 by 7.5 per cent. Consequently, the level of exchange rate continued to appreciate from 2004 to early 2008. All share index rises from 23,774 in August 2004 to a high of 65,652.4 in March 2008 by 21.15 per cent. However in 2008, when the global and financial crisis set in, the Naira depreciated against the Dollar i.e =N= 117.00 for US \$ in 2007 to =N= 181.00 for US \$ in end Dec 2008 (CBN Annual Report, 2009). This adversely affected the growth of ASI in the stock market and returns. Thereafter the rate stabilises in 2010, from =N= 150.30 per US Dollar, a depreciation of 0.9 per cent compared to the level in 2009 (CBN Annual Report 2010). However this does not fully reflect in the movement of ASI for the eroded confidence of investors since the global financial crisis in 2008.

The trend of the money supply had been rising upwards as against the fluctuating trend of the ASI. Broad Money grew from 17.1 per cent at the end of December to 6.7 per cent in 2010 to 15.4 per cent at the end of Dceember 2011 respectively (CBN Annual Report 2011).

Even though the Arbitrage Pricing Theory is silent about which factors are likely to influence all assets, there is no formal theoretical guidance in choosing the appropriate group of macroeconomic factors to be included in the Arbitrage Pricing Theory and the correct amount of them. The co-movements of asset prices suggest the presence of underlying exogenous influence but we have not yet ascertain the magnitude of these macroeconomic variables on stock returns in Nigeria.

1.3 Research Questions

From the foregoing, this study intends to answer the following research questions

- i. What macroeconomic variables have significant influence on stock returns in Nigeria?
- ii. Is there any long-run relationship between stock returns and macroeconomic variables?
- iii. Is there any causality between the macroeconomic variables and stock returns?

1.4 Objective of the Study

The study empirically assesses the impact of macroeconomic variables on stock returns in the Nigeria capital market from 2000 to 2012 using monthly data. The following specific objectives are stated as:

- I. To evaluate the long-run relationships between stock returns and the macroeconomic variables
- II. To examine the causality between some macroeconomic variables on stock returns

1.5 Research Hypothesis

The research hypotheses are as follows:

H_0 : There is no significant relationship between macroeconomic variables and stock return.

H_0 : There is no long-run relationship between macroeconomic variable and stock returns

H_0 : There is no causality between macroeconomic variables and stock returns

1.6 Significance of the Study

This research seeks to employ the model adopted from several empirical study and macroeconomic theories with five macroeconomic variables namely interest rate, exchange rate, money supply, inflation rate, in the Nigerian stock exchange. Another variable was added to the model as a proxy for international influence on Nigerian stock exchange which is the US prices (S&P 500). The economies of developing countries may be affected by global economic indicators rather than domestic economic measures. Also the growing influence of foreign investors in these markets following their opening up to international investments inflow may weaken national economic variables and share returns. In this context, the movements in leading developed capital markets may exert a significant influence on the behavior of stock returns in these small markets. As many of these markets have very short histories of organized share trading, the perception of investors may be different from those in developed markets. Therefore the behavior in developing stock markets may not be tied down to economic fundamentals; rather the stock prices may be driven by the speculative activities of irrational investors abroad and or global policy actions. So many empirical works attest to the influence of developed market activities on the emerging stock markets such as Abraham (2009) examines how Nigerian stock market (NSE) responds to global policy actions adopting the descriptive analysis, the results show that oil market policy adjustment and monetary policy actions of interest rate influences NSE stronger than the fiscal policy actions stimulus packages and that these policies had not helped NSE to recover efficiently as against the hypothesis by the countercyclical macroeconomic theory, therefore this study intends to provide evidence on some macroeconomic

variables (Money supply, Exchange rate, Inflation rate, interest rate and US Stock prices) on stock returns in Nigeria. This will help to guide the behavior of market participants in the economy and to guide the government/Monetary authorities on the right appropriate policy decisions.

1.7 Scope of the Study

The research covered the period between 2000 and 2012 using monthly data. These years have been chosen to enable the analysis of the effects of macroeconomic variables on stock returns before and after the 2008 stock market crisis at the Nigerian stock exchange.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Conceptual Literature

There are many views of what a stock exchange is according to Armstrong (1994) author of the book of stock exchange, a stock exchange is defined as “the citadel of capital, the temple of values. It is the axe of which the whole financial structure of the capitalist system turns”. Literally however, a stock market can be described as a market of securities. Stock market acts as important catalyst for economic development and growth.

The Nigerian Capital Market is a market for sourcing of medium and long-term funds by both the government and private sectors of the economy. The strategic roles of the capital market in the allocation of scarce financial resources for rapid growth and development of any nation is well documented. A place where securities (bonds, stock, and shares) of varying type are traded openly and where one can purchase or sell any of such securities relatively easily.

Okafor (1999) describes a stock exchange as an organized secondary market since a stock exchange is really strictly a market for existing rather than new shares. The stock exchange provides an avenue for the movement of long-term capital funds from those with savings to investment in those areas of industries, commerce and government where funds are absent for expansion and other developmental purpose. According to Aliele and Anao (1986) the stock exchange can also be a mechanism (barometer as some would suggest) which can measure and detect the systems of an impending economic boom or decline long before the predicted prosperity or decline actually occurs. All over the world, stock markets act as important catalyst for economic growth and development. Without a fully developed stock market, a country would

not be able to grow its equity funding and move towards more balanced financial structures as the stock exchange is the engine room for fund generation. Also, stock markets enable publicly traded companies to raise investment capital through the sale of shares to investors.

Broad Money (M2)

Friedman and Schwartz (1963) cited in Smith and Sims (1993) explained the relationship between money supply and stock returns by simply hypothesizing that the growth rate of money supply would affect the aggregate economy and hence the expected stock returns. An increase in M2 growth would indicate excess liquidity available for buying securities, resulting in higher security prices. In the opinion of Mukherjee and Naka (1995), the effect of money supply on stock prices is an empirical question. An increase in money supply would lead to inflation, and may increase discount rate and reduce stock prices Fama (1981). The negative effects might be countered by the economic stimulus provided by money growth, also known as the corporate earnings effect, which may increase future cash flows and stock prices. Maysami and Koh (2000), who found a positive relationship between money supply changes and stock returns in Singapore, further support this hypothesis.

Azeez and Yenewa (2003) examine through the use of APT, the empirical evidence of pricing macroeconomic factors in Japanese stock market during the bubble economy which enable them first to identify macroeconomic factors that are a source of systemic risk and second, to compare the price factors of the bubble period with the price factors of pre- and post bubble periods. They concluded that money supply risk factor is one of the four factors that have significant influence on expected return. Also Sulaiman, Adnan and Adnan (2009) show that the money supply M(2) is significantly and negatively related to stock price.

Consumer Price Index (CPI)

Consumer Price Index is used as a proxy of inflation rate. CPI is chosen as it is a broad base measure to calculate average change in prices of goods and services during a specific period. The relationship between inflation and stock return is highly controversial. Geske and Roll (1983) documented a negative relationship between inflation and stock returns. An increase in inflation is expected to increase the nominal risk free rate, which in turn will raise the discount rate used in valuating stocks. If cash flow increases at the same rate the effect will neutralize. On the other hand, if contracts are nominal and cannot adjust immediately, the effect will be negative. Also, the empirical evidence suggests that a high and variable inflation rates increase inflation uncertainty and thus lower share value. Adrangi, Charath and Shank (1999) argued that stock returns are negatively related to expected and unexpected inflation in developing stock markets such as India, Peru and Chile. Also Sulaiman, Adnan and Adnan (2009) found that whole sale price index is significantly and positively related to stock returns. A study conducted by Durai and Bhaduri (2009) in india also affirms strong negative relationship between inflation and stock returns in the short and medium term.

Interest rate

There is a negative relationship between interest rates and stock prices for the following reasons: Firstly, interest rates can influence the level of corporate profits which in turn influence the price that investors are willing to pay for the stocks through expectations of higher future dividends payment. Most companies finance their capital equipments and inventories through borrowings. A reduction in interest rates reduces the costs of borrowing and thus serves as an incentive for expansion. This will have a positive effect on future expected returns for the firm; Secondly, as substantial amount of stocks are purchased with borrowed money, hence an increase in interest

rates would make stock transactions more costly. Investors will require a higher rate of return before investing. This will reduce demand and lead to a price depreciation. Fama (1990) study reveals a negative relationship between inflation and stock returns his argument being that the level of economic activity is expected to have a positive effect on future cash flow and thus will affect stock prices in the same direction. Uddin and Alam (2007) examine a linear relationship between share prices and some macroeconomic variables on Dhaka stock exchange, they found that interest rate have a significant negative relationship with share prices and changes in interest rate significantly affect stock prices negatively. In another study similarly conducted by Butt,*et al* (2010) to examine the impact of interest rate on stock exchange in fifteen developed and developing economies: Australia, Bangladesh, Chile, Canada, Columbia, Germany, Italy, Jamaica, Japan Malaysia, Mexico, the Philippine, South Africa, Spain and Venezuela. their empirical finding show that interest rate have a significant negative relationship with share prices for six countries, it also found that changes in interest rate have a negative significant relationship with changes in of share prices. Therefore if change in interest rate is controlled in these countries it would be a great benefit to these countries' stock market through the demand pull way of more investors in the share market and supply push way of more extensional investment of companies. Also Sulaiman, Adnan and Adnan (2009) found that interest rates in Pakistan are significantly affecting stock prices.

Exchange rate

A depreciation of the Nigeria's naira will lead to an increase in demand for Nigeria's exports and thereby increasing cash flows to the country, assuming that the demand for exports is sufficiently elastic. Alternatively, if the Nigeria's naira is expected to appreciate, the market will attract investments. This rise in demand will push up the stock market level, suggesting that stock

market returns will be positively correlated to the changes in the exchange rates (Mukherjee and Naka 1995). The impact of exchange rate changes on the economy will depend to a large extent on the level of international trade and the trade balance. Hence the impact will be determined by the relative dominance of import and export sectors of the economy (term of trade effect).

Aliyu (ND) examines the longrun relationship between stock prices and exchange rate using Eagles granger two step and Johansen & Juluis cointegration procedures from the period of February 2001 to December 2008 in Nigeria. His finding reveals a longrun bidirectional relationship between stock prices and exchange rate in the models estimated. Yui (2008) shows empirical evidence that there is a long run relationship between Japan and Taiwan stock exchange markets for the year January 1991 to March 2008 however no short run casual relationship exist between the two financial assets.

US Stock Prices

The S&P 500 composite price index was employed as a proxy for external factors in our models; the literature suggests that the US market poses a significant influence on most of the markets in the world. We incorporate the US stock index as a proxy variable for external influences in our model. The 2008 financial crisis which occurred at the later part of the existence of the NSE led to the stock market crash. It is noteworthy that the market crash cannot completely be attributed to the NSE alone because it was a spillover effect from the Mortgage collapse in America and Europe.

Nevertheless among the successes of the Stock exchange within these periods of time was the attraction of massive foreign investments from Europe, America, Asia, Latin America and most especially from other African countries. These foreign investments ran into billions of naira.

Thus, the stock market crash in Europe and America/Asia, the foreign investors withdrew their investments or rather sold their shares to companies in Nigeria that principally led to run on stocks at the NSE which eventually culminated in the collapse of the market. Therefore there is a contagion effect among global financial and emerging equity markets (see Harvey, 1995) and Fitfield (2002). Since we expect the US stock market to have an effect on the Nigerian stock market, but not the reverse, we include it as a control variable. This allows us to trace out any effect that the US stock market has on the Nigerian stock market, but not vice versa.

One way of linking macroeconomics variables and stock market returns is through arbitrage pricing (APT), where multiple risk factors can explain asset returns (Ross, 1979). While early empirical papers on APT focused on individual security returns, it may also be used in an aggregate stock market framework, where a change in a given macroeconomic variable could be seen as reflecting a change in an underlying systemic risk factor influencing future returns. An alternative, but not inconsistent approach is the discounted cash flow or present value model (PVM). This model relates the stock price to future expected cash flows and the discount rate of these cash flows.

Capital Asset Pricing Model (CAPM) developed by Sharpe (1964) considers the risk-free return and volatility of the risk-free return to market return as the determinants of asset price. Asset price as described by CAPM is linearly related to the two independent variables.

2.2 Theoretical Literature

2.2.1 Capital Asset Pricing Theory

The Capital Asset Pricing Model (CAPM) was proposed as a model of risk and return by Sharpe (1964). It has become the important model of the relationship between risk and return in asset pricing. CAPM has its basis in the construction of an efficient market portfolio that maximizes return, given a level of risk. The expected return of an individual security is a function of its risk covariance with the market. The model speculates that the expected return on a stock is determined by the risk free interest rate and a risk premium which is a function of the stock responsiveness to the overall movement in the market that is its beta coefficient. The CAPM can be written as

$$E(R_t) = R_f + \beta * E(R_m - R_t) \dots\dots\dots(2.1)$$

Where $E(R_t)$ is the expected return on a stock, R_f is the risk free rate of return; R_m is the expected market return (return on the market portfolio); β is the beta coefficient which is a function of the stock responsiveness to the overall movements in the market.

Early empirical test of the model generally supported its main predictions as beta being the only explanatory factor in explaining the cross sectional variation across stock portfolios. However, more recent empirical works on asset pricing has identified a number of variables that help explain cross sectional variation in stock returns in addition to the market risk variable. Ross (1976) argued that the market portfolio should in theory include all types of assets that are held by anyone as an investment including works of arts, real estate, human capital etc. but said in practice, such as market portfolio is unobservable. The CAPM determines interest rate as a major factor in asset returns.

2.2.2 Discounted Cash Flow Model (DCF)

In finance, discounted cash flow model (DCF) model analysis is a method of valuing a project, company, or asset using the concept of time value of money. All future cash flows are estimated and discounted to give their present values (PVs). The sum of all future cash flow both incoming and outgoing is Net Present Value (NPV), which is taken as the value or price in question. The discount rate used is generally the appropriate weighted average of capital (WACC) that reflects the risk of the cash flows. The discount rate reflects two things:

1. The time value of money (risk free rate) – according to the theory of time preference, investors would rather have cash immediately than wait and must therefore be compensated by the delay.
2. A risk premium- reflects the extra return investors demand because they want to be compensated for the risk that the cash flow might not materialize after all.

Following the stock market crash of 1920, discounted cash flow model gained popularity as a valuation method for stocks. Irving Fisher in his 1930 book” the theory of interest” first formally expressed the DCF method in modern economic terms.

The discounted cash flow formula is derived from the future value formula for calculating the time value of money and compounding returns.

$$DPV = \frac{CF_1}{1+R} + \frac{CF_2}{(1+R)^2} + \dots + \frac{CF_N}{(1+R)^N} \dots\dots\dots (2.2)$$

$$FV = DPV * (1 + i)^n \dots\dots\dots (2.3)$$

Thus the discounted present value (for one cash flow in one future period) is expressed as

$$DPV = \frac{FV}{(1+i)^n} = FV(1 - d)^n \dots\dots\dots (2.4)$$

Where:

DPV is the discounted present value of the future cash flow (**FV**), or FV adjusted for the delay in receipt. FV is the nominal value of cash flow amount in a future period. I is the interest rate which reflect the cost of tying up capital and may also allow for risk that the payment may not be receive in full. The advantage of the DCF model is that it can be used to focus on the long run relationship between the stock market and macroeconomic variables. Campbell and Wayne (1991) examine the relationship between stock prices, earnings and expected dividends. They find that a long term moving average of earnings estimate predict dividends and the ratio of this earning variables to current stock price is powerful in predicting stock returns over several years. They conclude that these facts make stock prices and returns much too volatile to accord with a simple present value model.

2.2.3 Arbitrage Pricing Theory (APT)

Developed by Economist Stephen Ross in 1976, Arbitrage pricing theory is a general theory of asset pricing which contends that a relationship exist between the returns of portfolio and the returns of a single asset may be charted through a linear combination of many independent macroeconomic variables. These macroeconomic variables are called risk factor, in other words, Arbitrage pricing theory asserts that if two or more securities or portfolio have identical return or risk, then they should sell for one price. Since Arbitrage pricing theory gives the expected price of an asset, arbitrageurs use APT to identify and take advantage from mispriced opportunities.

Assumptions of the Theory

- Only systematic risk is relevant in determining expected returns (similar to CAPM), however there may be several non-diversifiable risk factors (different from CAP model since CAPM only assumes only one risk factor) that are systematic or macroeconomic in nature and thus affect the returns of all stock to some degree.
- Firm specific risk since it is not easily diversified out of any well specified portfolio is not relevant in determining the expected return of securities. This is similar to CAP Model.

2.2.4 Comparism between CAPM and Arbitrage Pricing Theory

APT seeks to overcome the weakness of CAPM as it uses fewer assumptions. While the CAPM requires the market's expected returns APT uses the risk asset expected return and the risk premium of a number of macroeconomic variables. The logic of the APT model is that there is no single factor that explains risk and return relation. The APT postulates that the return expected from a financial asset can be presented as a linear function of various theoretical market indices and macroeconomic factors Ross (1979). It is assumed that the factors considered are sensitive to changes represented by a factor specific beta coefficient (β).

Base on the problem of specification of risks factors in the APT model Hasan, *et al.* (2011) suggested the following for any legitimate risk factor to posses:

- At the beginning of every period, the factor must be completely unpredictable to the market.
- Each APT must have a pervasive influence on the stock returns

- Relevant factors must influence expected returns i.e they must have non-zero prices.

There are basically two approaches to be followed in specifying the nature and the number of the priced factors by the APT.

- Factor analysis / Principal component analysis and extend by Ross (1979)
- Macroeconomic variable as attempted by Chen *et al* (1986)

The primary advantages of using macroeconomic factors are firstly, the factors and their APT prices in principle can be given economic interpretations while with the factor analysis approach it is unknown what factors are being priced and Secondly, rather than only using asset prices to explain asset prices, observed macroeconomic factors introduce additional information, connecting asset price behavior to macroeconomic events (Azeez, &Yenewa, 2003).

2.3 Empirical Literature

2.3.1 Empirical Studies From Developed Economies

Early studies of the relationship between stock prices and macroeconomic variables concentrate primarily on the US stock exchanges. Most of them were guided by the Arbitrage pricing theory (APT) developed by Ross (1976). Fama (1970) proposed an Efficient market hypothesis (EMH) suggesting that earning abnormal high profits would be impossible due to competition among investors who follow a profit-maximizing behavior. The EMH assumed that economic actors possess all the relevant information so that all changes in macroeconomic variables are fully reflected in stock prices. Various macroeconomic variables including inflation, money supply and exchange rate were determined as a source of stock prices changes (Fama 1981; Chen *et al.*, 1986; Smith and Sims 1993). Granger (1986) and Juselius (1990) attempted to define the existence of long-term equilibrium using the cointegration analysis, which by now, has become the preferred way for studying the relationship between macroeconomic variables and stock prices.

Chen, Roll and Ross (1986) test the multifactor model in the USA by employing seven macroeconomic variables. They find that consumption, oil prices, and the market index are not priced by the financial market. However, industrial production, changes in risk premium, and twist in the yield curve are found to be significant in explaining stock returns.

Chen (1991) performed the second study covering the USA. Findings suggest that future market stock returns could be forecasted by interpreting some macroeconomic variables such as default spread, term spread, one month t-bill, industrial production growth rate, and the dividend-price ratio.

Mukherjee and Naka (1995) use vector error correction approach to model the relationship between Japanese stock returns and macroeconomic variables. Cointegration relation is detected among stock prices and the six macroeconomic variables, namely exchange rate, inflation rate, money supply, real economic activity, long term government bond rate and call money rate. Gjerde and Sættem (1999) examine the causal relation between stock returns and the macroeconomic variables in Norway. Results show a positive linkage between oil price and stock returns as well as real economic activity and stock returns. The study, however fails to show a significant relation between stock returns and inflation.

Recent studies by Flannery et al. (2002) reevaluate the effect of some macro announcement series on US stock returns. Among these series, six macro variables, namely, balance of trade, housing starts, employment, consumer price index, M1 and producer price index seem to affect stock returns. On the other hand, two popular measures of aggregate economic activity (real GNP and industrial production) do not appear to be related with stock returns.

Andreas and Peter (2007) using the standard discount model, a cointegration analysis is applied to model the longrun relationship between industrial production, consumer price index, money supply, long term interest rate and stock prices for both USA and Japan stock markets. Empirical study reveals that for the USA stock prices a single cointegrating vector is found where stock price is positively related to both consumer price index and long term interest rate and an insignificant but positive relationship with money supply. However, for the Japan stock prices findings reveal a two cointegrating vectors where stock prices are influenced positively by industrial production and negatively by money supply. The study align the contrasting result to the slump in the Japanese economy during the 1990s and consequent liquidity gap.

2.3.2 Empirical Studies from Emerging Economies

There is a small but rather growing literature on the relationships between stock returns and macroeconomic fundamentals in the emerging economies.

Ramin, *et al.* (2004) carried out a study on the relationship between macroeconomic variables and stock market returns in Singapore by examining the long-term equilibrium relationships between selected macroeconomic variables and the Singapore stock market index (STI), as well as with various Singapore Exchange Sector indices—the finance index, the property index, and the hotel index. The study concludes that the Singapore's stock market and the property index form cointegrating relationship with changes in the short and long-term interest rates, industrial production, price levels, exchange rate and money supply.

Mauri (2006) in Russian market examine how well APT explains the Russian 20 biggest equities on some macroeconomic variables adopting regression analysis. The result shows an insignificant relationship between equity returns and the macroeconomic variables, but for only one equity was significant to the anticipated changes in prices. However this cannot conclude that the APT does not work with assets pricing in Russia but the problem could be inherent in the thesis as the macroeconomic variables were not lagged.

Sulaiman *et al.* (2009) explores the correlation among the macroeconomics variables and share prices of KSE (Karachi Stock Exchange) in context of Pakistan. The study consider several quarterly data for different macroeconomics variables such as foreign exchange reserve, foreign exchange rate, industrial production index (IPI), whole sale price index (WPI), gross fixed capital formation (GFCF) and broad money M2. These variables are obtained from the period 1986-2008. The result shows that after their forms in 1991 the influence of foreign exchange rate and foreign exchange reserve significantly affect the stock prices, while other variables like IPI

and GFCF insignificantly affect stock prices. The result also highlighted the internal factors of firm like increase in production and capital formation insignificant while external factor like M2 and foreign exchange affect positively.

Yui (2008) Tests the Efficient market hypothesis (EMH) for the Chinese stock market with respect to monetary policy. The vector autoregression (VAR) models are used to estimate the relations among stock returns and relative macroeconomic variables related to monetary policy. He focuses on how stock returns are explained by macroeconomic variables to interpret the impacts of monetary policy on stock returns. The estimated VAR equation proves that there are significant impacts of lagged changes of interest rate, money supply and GDP on stock returns. The results support the semi-strong form of the EMH for the Chinese stock market.

Abdul (2008) investigates the dynamic interactions between four macroeconomic variables and stock prices in Pakistan, using cointegration and Granger causality tests that are robust to structural breaks. The results strongly suggest cointegration between the stock prices and macroeconomic variables viz. consumer prices, industrial production, exchange rate and the market rate of interest. Estimates of bivariate error-correction models reveal that there is long-run bidirectional causation between the stock prices and all the said macroeconomic variables with the exception of consumer prices that only lead to stock prices. The results also provide some evidence that the stock prices Granger-caused by changes in interest rates in the short run. However, the analysis is unable to explore any short-run causation between the stock prices and the remaining three macroeconomic variables. It may therefore be stated that the association between the health of the stock market in the sense of a rising share prices and the health of the economy is only a long-run phenomenon.

Sardar, *et al.* (2004) used a financial econometrics analysis of the valuation of Thai stock. The results shows the empirical characteristic of the stock exchange of Thailand that market index prices are determined by the interest rate, foreign exchange rate, bond rate, market capitalization P/E ratios and consumer price index in both short and long run.

Melina and Chaido (2011) examined the long run relationship between three macroeconomic variables namely inflation rate, interest rate, and industrial production on the Athens stock exchange market using the data from 1988 to June 2003 and found that cointegration vector exists as the variables tend to evolve together over time.

Husam, *et al.* (2009) find that there are some other variables that may affect stock market returns in ISE apart from the ones been examined namely unanticipated inflation, term structure, risk premium, and money supply on stock market returns adopting the OLS technique, the variables exhibit a weak explanatory power based on the finding from the period of January 2001 to September 2005.

Oguzhan and Erdal (2009). Investigates the causal relationship between stock prices and macroeconomic variables using data from February 2001 to January 2008 in turkey, the results shows a bi-directional causal relationships between exchange rate and All share market indices while a negative causality exist from national 100, services, financials and industrial indices to exchange rate, there is a positive relationship from technology indices to exchange rate.

Arshad and Zafar (ND) examines the relationship among inflation, Industrial production, oil prices, short term interest rate, exchange rates, foreign portfolio investment, money supply and equity prices for period of 6/1998 to 6/2008 by using Autoregressive distributed lag approach, result shows Industrial production, oil prices and inflation are not statistically significant in

determining equity price, while interest rate, exchange rate and money supply are significant in determining equity prices in Pakistan.

Soyode (2009) adopted a model by Al-Tanimu (2007) to depict relationships among the variables (stock prices and earnings per share, gross domestic product, lending interest rates, and foreign exchange rate) all variables have positive correlation to stock prices with the exception of lending interest rates and foreign exchange rates.

Mohammed (2011) found a positive relationship between stock returns and Industrial production, market earnings, and market capitalization while negative influence exist between stock returns and inflation and foreign remittance in Dhaka stock exchange using multivariate regression model on OLS formula. He also opined an informational inefficient market due to lack of Granger causality between stock prices and the macro and micro variables.

Singh (2011) examines all companies listed from 2003 to 2008 on the Taiwan stock exchange. A linear regression method was applied to test the relationship between share prices and macroeconomic variables. Empirical findings reveal that exchange rate and GDP seem to affect returns of all portfolios, while inflation rate, exchange rate and money supply were having negative relationship with returns for portfolios of big and medium companies.

Saeed et al. (2012) examines the relationship between exchange rate, world gold price, inflation, liquidity and oil prices using GACH method on stock returns in Tehran stock exchange, findings reveal that gold price, inflation and exchange rate variables significantly affects stock returns while oil price and liquidity has no impact on stock returns

Pramod and Piya (2012) investigates the longrun relationship between five macroeconomic variables namely industrial production index, whole sale price index, money supply, treasury bill rate and exchange rate over the period of 1994 to 2011. Using Johannes's cointegration and VEC

analysis reveals that stock prices positively relates to the money supply and industrial production but negatively relates to inflation. The exchange rate and short term interest rate are found to be insignificant in determining stock returns.

Kuwurno (2012) study the cointegration analysis between some macroeconomic variables namely inflation, crude oil prices, exchange rate and interest rate on stock returns using monthly data for the period 1992 to 2008. Johansen cointegration procedure was used and empirical result show that inflation rate appears to the most influential macroeconomic variable affecting stock return in Ghana.

Saeed, Ozra and Meysam (2012) a GACH model is employed to analyse the influence of five macroeconomic variables on stock market in Tehran under the arbitrage pricing theory framework. The study shows that gold price, inflation and exchange rate variables influence on stock returns.

Haruna, Yazidu and Paul (2013) examines the longrun relationship between stock performance and macroeconomic variables employing the VEC model from the period of Jan 1995 to Dec 2010. The study reveals that a significant long run relationship exist between stock returns and inflation, money supply and foreign direct investment (FDI) . in the short run, a significant relationship exist between stock returns and interest rate, money supply and inflation. The findings reveal that arbitrage profit opportunities exist in the Ghana stock market contrary to the dictates of Efficient market hypothesis (EMH).

2.3.3 Empirical Studies from Nigeria

Attempts have been made by Nigerian researchers to investigate the relationship between macroeconomic variables and stock prices. Soyode (2009) made an attempt to test the association between stock prices and macroeconomic variables as exchange rate, inflation and

interest rate. He found that the macro economic variables are cointegrated with stock prices are consequently related to stock returns.

Amadi, *et al.* (2000) employed multiple regression to estimate the functional relationship between money supply, inflation, interest rate, exchange rate and stock prices. Their study revealed that the relationship between stock prices and the macroeconomic variables are consistent with theoretical postulation and empirical findings in some countries. Though, they found that the relationship between stock prices and inflation does not agree with some other works done outside Nigeria.

Mayewa, *et al.*, (2010) attempt to establish a long-run relationship between the stock market and some of macroeconomic indicators. His result shows that only industrial production and level of interest rates, as represented by the 3-month commercial bank deposit rate have a long-run relationship with the stock market. He also found that the Nigeria market responds more to its past prices than changes in the macroeconomic variables in the short run.

Ologunde, Elumilade and Asaolu (2006) examine the relationships between stock market capitalization rate and interest rate. They found that prevailing interest rate exerts positive influence on stock market capitalization rate. They also found that government development stock rate exerts negative influence on stock market capitalization rate and prevailing interest rate exerts negative influence on government development stock rate.

Mayowa and Ehi (2010) applied the OLS technique in order to model the long run relationships between macroeconomic variables and ASPI in Nigeria, estimation result reveals a significant long run relationships between stock market returns and all other variables (GDP, inflation, money supply, exchange rates and industrial production index) except the interest rates which has a negative relationship with stock prices during the period of study from 1984 to 2006.

Ezedonmi *et al.*, (2011) test the applicability of APT in the NSE for a period of 2000 to 2004 using three macroeconomic variables namely inflation, exchange rate and market capitalization on 20 sectors of the Nigerian stock exchange employing OLS technique, the results reveal a non significant effect of these variables on stock returns in Nigeria.

Arodeye et al. (2012) study the impact of macroeconomic variables like real GDP, inflation rate and interest rate on stock returns using quarterly data from 1985 to 2009. Evidence from VAR model shows that there is a longrun relationship between stock prices, inflation rate and real GDP for the period under review

Abraham (ND) examines the relationship between stock market and some selected macroeconomic variables in Nigeria i.e imflation rate, interest rate and exchange rate. Employing error correction model, he found that a significant negative short run relationship exist between the stock market and the MRR, while exchange rate stability in the long run improves the performance of the market

Kalu and Okwuchukwu (2014) examine the impact of broad money supply, CPI, credit to the private sector, exchange rate and net foreign asset on stock returns from 1996 to 2013. Result from GARCH-X model shows that NSE return volatility is positively influenced by changes in broad money supply and inflation rate. Net foreign asset shows a negative but significant influence in stock returns

Ifueno and Esther (2012) study the influence of some macroeconomic variables on stock prices (proxy for All share index) from the period 1975 to 2005. The vector correction model was employed and findings reveals that there is a long run relationship between six macroeconomic

variables namely interest rate, inflation rate, exchange rate, fiscal deficit, GDP and money supply and stock market index in Nigeria.

Sally (2011) empirically investigates the relationship between macroeconomic variables and stock returns under the Arbitrage pricing theory framework from the period 2005M1 to 2010M1. Ordinary Least Square method was applied and findings reveal that a significant variation in stock market return is caused by consumer price index, short term interest rate and money supply.

Emeka and Aham (2013) used the GARCH to model the Nigeria stock market returns using annual data 1985 to 2009. Result shows that inflation, government expenditure index of manufacturing output and interest rate have strong significant influence on stock returns. Money supply and foreign exchange rate have no significant impact on stock returns. The study observed volatility clustering in the Nigeria stock exchange market.

In light of the above mentioned studies, it should be evident that stock returns can be predicted from macroeconomic variables, the predictability of stock returns should present a challenge to the EMH theory.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Data Description

In this work, we draw upon theory and existing empirical works as a motivation in selecting a number of macroeconomic variables that we expect to be strongly related to stock returns in Nigeria. Five macroeconomic indicators and a control variable that are hypothesized to exert influence on stock returns are consumer price index (CPI) as a measure of inflation, exchange rate, broad money supply (M2), Nigeria treasury bills rate as a measure of Interest rate, and US stock prices (Standard & Poor 500 index) as a control variable.

3.2 Sources of Data

The monthly data cover the period of 2000 to 2012. Data was sourced from Annual Reports of Securities and Exchange Commission's Statements of Accounts and Annual Report of the CBN (2011).

3.3 Model Specification

To examine the relationship between macroeconomic factors and equity market returns, the following model was estimated.

$$\ln(I_t - I_{t-1}) = \beta_0 + \beta_1 \ln \text{CPI}_t + \beta_2 \ln \text{EXR}_t + \beta_3 \ln \text{NTB}_t + \beta_4 \ln \text{USP}_t + \beta_5 \ln \text{M2}_t + \mu_t \dots \text{Eq.(5)}$$

Where

I= All share index

EXR= Foreign Exchange Rates \$/ N.

NTB = Nigerian Treasury bill rate as a measure for Interest Rate

CPI = Consumer Price Index as a measure for Inflation rate

USP= US prices as control variable

M2= Broad Money

3.4 Estimation and Evaluation Procedure

3.4.1 Unit Root Test

In order to check the stationarity of the macroeconomic variables, we use Augmented Dickey-Fuller unit root test for all the variables used in this study. Using independently and identically distributed processes, Dickey and Fuller (1981) calculated the empirical distribution of t-statistics under the null hypothesis that the series has unit root. To test the unit root hypothesis, the following form of the Augmented Dickey- Fuller test is used on each of the variables.

$$\Delta X = \alpha + \beta T + \rho X_{t-1} + \sum_{i=1} \lambda \Delta X_{t-1} + \varepsilon_t \dots \dots \dots \text{Eq(6)}$$

Where ΔX = the longrun logarithms of the variables in period t, T = time trend,

$\Delta X_{t-1} = X_{t-1} - X_{t-2}$, ε_t = i i d disturbance with mean 0 and variance σ^2 , $\alpha, \beta, \rho, \lambda$ = coefficients

In an unit root test, the null hypothesis to be tested is that the coefftcient of x with one lag is equal to zero ($H_0: \rho = 0$). If unit root test rejects the null hypothesis that the series has unit root, it means that the series is stationary But, if the unit root test can not reject the null hypothesis, it means that the series are not stationary and we need to apply difference operator to make the series stationary. We also use Phillips-Perron test (1988) to avoid the restrictive assumptions in Augumented Dickey-Fuller test that errors are statistically independent and have a constant variance. Phillips-Perron test has milder assumption on error terms and its test statistic is a modification of ADF t-statistics.

3.4.2 Cointegration Analysis

Cointegration is a method of defining the long-term relationship amongst a group of time series variables. It uses the idea of an integrated time series in describing the long run interaction and

arose in the context of the spurious regression problem. To be related to one another statistically in the long run, variables must be of the same order of integration. The presence of cointegration among relevant variables implies that a linear combination of non stationary time series variables is stationary. The Johansen (1991) Cointegration was estimated as thus:

$$Y_t = \mu + Q_1 Y_{t-1} + \dots + Q_p Y_{t-p} + \varepsilon_t \dots \text{Eq (7)}$$

Where Y_t is an $n \times 1$ vector of variables that are integrated of order 1, and ε_t is an $n \times 1$ vector of innovation.

$$\Delta Y_t = \mu + \Pi Y_{t-1} + \sum_{j=1}^p \Gamma_j \Delta Y_{t-j} + \varepsilon_t \dots \text{Eq (8)}$$

Where $\Pi = \sum_{j=1}^p A_{j-1}$ and $\Gamma_j = \sum_{i=j+1}^p A_i$

As the coefficient matrix Π has reduced rank $r < n$, then there exist $n \times r$ matrices α and β each with rank r such that $\Pi = \alpha\beta$ and βY_t is stationary, r is the number of the cointegrating relationship, the element of α are known as the cointegrating parameters in the vector error correction model and each column of β is a cointegrating vector. For a given r , the maximum likelihood estimator of β defines the combination of Y_{t-1} that yields the r largest canonical correlation of ΔY_t with ΔY_{t-1} after correcting for lagged differences and deterministic variable when present. Johansen method is to estimate the Π matrix from an unrestricted VAR.

The equation above will be cointegrated with all the variables converted into natural log. The aim is to measure the rate at which it will be captured by the coefficient of the regressors. The lag selection criteria that was used to determine the number of lags in the cointegrating equation are AIC, SC and HQ. If the result shows the existence of cointegration going by the Trace and Maximum Eigen test, then it necessitates estimation using the Error correction mechanism.

3.4.3 Error Correction Mechanism

Johansen (1991) multivariate estimation of Vector Error Correction Model (VECM) allows testing for cointegration in a system of equations. This method does not require a specific variable to be normalized and gives more efficient estimators of cointegrating vectors (Gujarati and Damodar, 2010): The VECM is a better method for its capability of using all variable as endogenous.

$$\Delta Y_t = \mu + \sum_{j=1} \Gamma_j \Delta Y_{t-j} + \alpha \beta Y_{t-k} + \varepsilon_t \dots \dots \text{Eq (9)}$$

where

D = First difference notation

Y_t = $p \times 1$ vector integrated of order one

m = $p \times 1$ constant vector representing a linear trend in a system

k = Lag structure

ε_t = $p \times 1$ Gaussian white noise residual vector

G_j = $p \times p$ matrix indicating short-term adjustments among variables across p equations at the j^{th} Lag.

a = $p \times r$ speed of adjustment

b = $p \times r$ cointegrating vectors.

3.5 Apriori Expectation

Interest rates, and inflation, are expected to have negative impact on returns, US stock price, Exchange rate and Money supply are expected to have a positive effect on equity returns.

CHAPTER FOUR

PRESENTATION OF RESULT AND ANALYSIS

4.1 Introduction

This chapter presents the estimated results and analysis. It starts with the Unit root tests results which aims at establishing the integration order of the variables under consideration, and meeting the pre-condition for the application of the Johansen Cointegration tests. Having found that all the variables are $I(1)$, a test for cointegration suggests the existence of one cointegrating relationship, which could not be identified as the Stock Returns Model, since the adjustment coefficient appeared positive and statistically insignificant. As a result, a stable VAR model was estimated with the first difference of all the variables, and its impulse response function was interpreted.

TABLE 4 .1 Descriptive Statistics

	LASI	LCPI	LEXR	LM2	LNTB	LUSP
Mean	9.934547	4.219105	4.868497	15.14961	2.272137	7.078078
Median	10.04044	4.276666	4.855618	15.11962	2.437990	7.099392
Maximum	11.09213	4.927254	5.065060	16.45747	7.303170	7.345610
Minimum	8.657459	3.380995	4.594109	13.38243	0.039221	6.599993
Std. Dev.	0.561065	0.429315	0.125414	0.906589	0.756069	0.161118
Skewness	-0.278380	-0.172803	-0.206424	-0.045246	1.200155	-0.608847
Kurtosis	2.803382	1.946011	2.306339	1.610248	15.06230	2.797719
Jarque-Bera	2.222587	7.843396	4.154007	12.36494	964.2862	9.713573
Probability	0.329133	0.019807	0.125305	0.002065	0.000000	0.007775
Sum	1519.986	645.5230	744.8800	2317.890	347.6370	1082.946
Sum Sq. Dev.	47.84874	28.01528	2.390761	124.9293	86.88924	3.945774
Observations	153	153	153	153	153	153

The results in table 4.2 reveal the presence of skewness and kurtosis in the data. All the variables are negatively skewed except for Nigerian treasury bills which are positively skewed. Therefore, the presence of skewness and kurtosis in the data indicate that the variables are not normally distributed. The Jarque-Bera test is in accord with this finding, because it also rejects the null hypothesis of normal distribution even at 1%.

4.2 Unit Root Test: Test For Stationary

TABLE 4 .2: UNIT ROOT TEST

Variables	LEVEL		FIRST DIFFERENCE		COMMENTS
	ADF	PP	ADF	PP	
LASI	-2.3401	-2.2853	-4.1341*	-10.5851*	I(1)
LCPI	-2.9482	-3.3047	-6.2197*	-13.5576*	I(1)
LEXR	-1.6905	-1.6497	-5.1512*	-8.7707*	I(1)
LM2	-1.5044	-2.4951	-6.0706*	-15.6897*	I(1)
LNTB	-2.6959	-4.8421	-6.8685*	-20.6062*	I(1)
LUSP	-2.5148	-2.0627	-4.4736*	-10.5864*	I(1)

Source: Researchers Estimation E-views output

The Unit root test was conducted to determine the order of integration of the series by using Augument Dickey Fuller (ADF) and Phillip Perron (PP) statistics. The result of the logged values of the variables (LASI, LCPI, LEXR, LM2, LNTB and LUSP) as shown in Table 4.1 shows that all the variables are non-stationary at levels for both ADF and PP statistics. After differencing the series, they became stationary, meaning they are all integrated of order one I(1). This suggests that there may be a long run relationship between the variables, which can be verified using cointegration test. The next section carries out this task.

4.3 Cointegration Results

TABLE 4.3 a. TRACE RANK TEST

TRACE RANK TEST				
Hypothesis	$r = 0^*$	$r \leq 1$	$r \leq 2$	$r \leq 3$
Trace stat.	96.02	55.87	36.36	18.82
5%	94.15	68.52	47.21	29.68
1%	103.2	76.07	54.46	35.65

Note: The Trace statistic indicates one co integrating equation at 5% but not at 1%.

Source: Researchers Estimation E-views output

TABLE 4.3b: THE MAXIMUM EIGEN TEST

MAXIMUM EIGEN TEST				
Hypothesis	$r = 0$	$r \leq 1$	$r \leq 2$	$r \leq 3$
Maximum Eigen stat.	40.14*	19.51	17.54	12.78
5%	39.37	33.46	27.07	20.97
1%	45.10	38.77	32.24	25.52

NOTE: The Maximum-Eigen test indicates one cointegrating equation at 5% but not at 1%

Source: Researchers Estimation E-views output.

The Johansen Multivariate cointegration test was conducted and the summary of the result is in Table 4.3a. The full result is shown in Appendix I. From Table 4.3a, the trace statistic indicated one cointegrating equation at 5 percent but not at 1 percent for example, at $r = 0$, the trace statistic 96.02 is higher than the 5 percent critical value 94.15, but less than the 1 percent critical value 103.2. However for all values of the r , the trace statistic measures lower than the critical values at both 5 percent and 1 percent. The Maximum Eigen values also confirm the same (see Table 4.3b). We can therefore conclude that there is at least one cointegrating relationship among the variables. In the next section, the corresponding VEC model is presented.

4.4 Vector Error Correction (VEC) Model

From the cointegration results, it is assumed that there is a long run equilibrium path between All-share Index and macroeconomic variables (CPI, EXR, USP.NTB and M2) having at least one cointegrating vector. Using the traditional lag length selection criteria, the optimum lag length was found to be one for AIC, SCH and HQ.

VAR Lag Order Selection Criteria

Endogenous variables: LASI LEXR LUSP LM2 LNTB LCPI

Exogenous variables: C

Date: 10/24/12 Time: 16:59

Sample: 2000M01 2012M12

Included observations: 145

Lag	LogL	LR	FPE	AIC	SC	HQ
0	92.46187	NA	1.22E-08	-1.192577	-1.069402	-1.142527
1	1305.576	2309.101	1.09E-15*	-17.42864*	-16.56641*	-17.07829*
2	1332.628	49.25214	1.23E-15	-17.30521	-15.70393	-16.65456
3	1357.970	44.04287	1.44E-15	-17.15820	-14.81788	-16.20725
4	1390.185	53.32235*	1.53E-15	-17.10601	-14.02663	-15.85475
5	1414.586	38.36769	1.83E-15	-16.94601	-13.12758	-15.39446
6	1435.902	31.75318	2.31E-15	-16.74347	-12.18599	-14.89161
7	1459.453	33.13467	2.86E-15	-16.57177	-11.27524	-14.41961
8	1481.060	28.61019	3.68E-15	-16.37324	-10.33766	-13.92078

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The causal relationship was further examined by using the Vector Error Correction Model specification. The summary of the result is in Table 4.3 (the complete VEC result is in Appendix III). To identify the cointegrating vector as the model for stock returns, the adjustment coefficient has to be negative and statistically significant, otherwise, the long run model is of the relationship between some combination of the other variables in the vector. Table 4.3 shows that only the error correction mechanism (or adjustment coefficient) for the explanatory variables LEXR, LUSP and LM2 were found to be negative and only LEXR was statistically significant with t-value of (-5.311). Indeed the error correction mechanism of the lagged All share index was found to be positive and significant, adjusted $\alpha = 0.017$ and the t- statistics is (3.1350). This implies that the (dis) equilibrium error made cannot be corrected in case of any deviations in the long run. Hence we accept our null hypothesis (H_0) that there is no long run relationship between stock returns and macroeconomic variables. Therefore, disequilibrium in the present

period cannot be correct with errors of the past period because the α is positive hence, errors of the present period will be accumulating by errors from the past which is exploding. This implies that the appropriate strategy will be to estimate a unrestricted VAR with all variables in their first difference. This task is undertaken in the next section

TABLE 4.4: VECTOR ERROR CORRECTION MECHANISM

ESTIMATE OF THE (IDENTIFIED) LONGRUN EQUILIBRIUM							
	LASI	LCPI	LEXR	LM2	LNTB	LUSP	C
CV	1.00	-14.1533	25.5275	2.8223	-0.5135	8.6788	-177.52
T-stat		-4.7133	6.4946	2.5506	-1.9307	5.9014	
Adj α (ECM)	0.017	0.02	-0.006	-0.002	0.043	-0.0005	
T- Stat	3.1350	1.3908	-5.3116	-4.4545	1.0182	-0.1237	

Source: Author's Computation

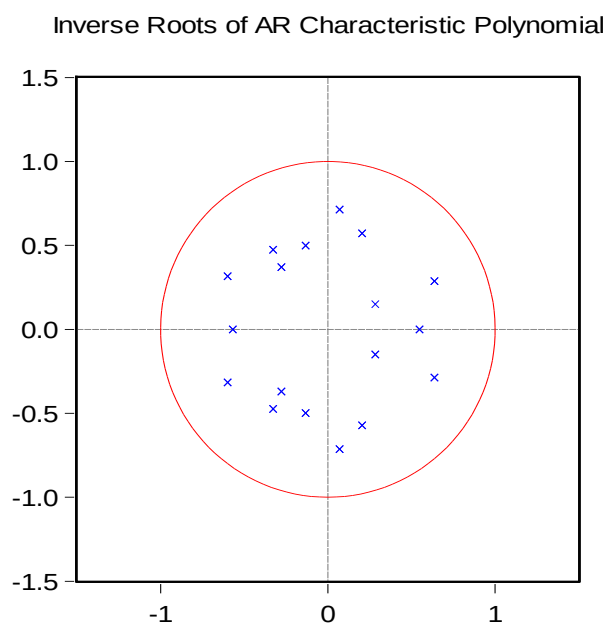
4.5 VAR Model

The VAR Model was estimated using the optimum lag length three (3) as suggested by LR selection criterion (see Appendix IV). The estimated VAR result is presented in Appendix V. The various diagnostic tests suggest that the estimated VAR is stable because the inverse of the roots of the characteristic polynomial are all within the unit circle (see appendix VI), and the error terms are normally distributed. This allows us to derive the corresponding Impulse Response Function and Variance Decomposition for to analyze out data. These tasks are undertaken in the next two sections. Because of the importance of ordering when cholesky decomposition is used, we tested for Granger causality in order to provide an empirical support for the choice of the ordering of the variables. Cholesky order assumes that the least endogenous variable is places first before the most endogenous. Consequently, the order used in the VAR is D(LCPI) D(LEXR) D(LM2) D(LNTB) D(LUSP) D(LASI).

4.5.1 Stability of the VAR

A necessary condition for the use of an estimated VAR is that it must be stable. Stability implies convergence, hence allows the impulse responses to shocks to settle down after some oscillations. A formal test for the stability of VAR is to examine the (inverse) roots of the Autoregressive Characteristic polynomial of the VAR. when all the inverse roots are within a unit circle, then the VAR is said to be stable. Figure 4.1 shows that the model meets the stability condition and is therefore robust and can be used for policy analysis because all points lies within the circle.

Fig 4.1 Stability Test



4.5.2 Impulse Response Function

The impulse response function is an alternative way to look at the variance decomposition analysis. Fig 4.2 shows the responses of LASI to impulses in the various macroeconomic variables included in the VAR. Unexpected changes in the CPI is found to have a negative and marginal impact on ASI. The negative relationship between inflation and stock returns suggests

that stock are not a good hedge against inflation. This counters the Fishers hypothesis which says that asset return should at least match the inflation rate to preserve its real value, if not more positively compared with it. This theoretical reasoning simply means that stock returns have a positive relationship with inflation. Empirical works that support this finding are Geske and Roll (1983) and Durai and Bhaduri (2009).

Variation in the Exchange rate is found to have positive but also marginal impact on stock returns. This means that depreciation of the naira raises stock returns. The possible mechanism for this effect is that as naira depreciates, and foreign exchange becomes dearer, investors re-adjust their portfolio to hold more stocks, thereby raising stock prices and therefore stock returns. A one standard deviation shock to the exchange rate raises stock returns to a maximum of 0.002 by the fifth period. This finding is consistent with that of Mohammed (2009). This is expected because Nigeria has had a stable exchange rate regime which is an incentive for foreign investors to invest in the Nigerian capital market which could yield higher returns. The movement of exchange rate was relatively stable under the period of the study (see graph in Appendix 9) due to some combination of factors namely; the non accommodating Monetary Policy stance of the CBN, and the prudent fiscal policy of government as well as increase in reserve arising from high crude oil prices in the international market i.e (from \$29.61 per barrel in 2003 to \$38.50 per barrel in 2004) and hence significant inflow of Foreign exchange. This reflects positively on the All Share index as it rises to 27,730.80 points in 2004 from 13,298 points in 2003 by 7.5 per cent. Consequently, the level of exchange rate continued to appreciate from 2004 to early 2008. All share index rises from 23,774 in August 2004 to a high of 65,652.4 in March 2008 by 21.15 per cent. However in 2008, when the global and financial crisis set in, the Naira depreciated against the Dollar i.e =N= 117.00 for US \$ in 2007 to =N= 181.00 for US \$ in end Dec 200

(CBN Annual Report, 2009). This was attributed to the effect of the global financial crisis which led to the sudden withdrawal of funds from the stock market for obvious reasons; the need for firm investors of high income countries to strengthen their balance sheet, increased risk aversion in investment, decrease in commodity prices including crude oil prices, re-assessment of the Nigeria's capital market growth prospects leads to the repatriation of capital from developing to Advance economies. This adversely affected the growth of ASI in the stock market and returns. Thereafter the rate stabilises in 2010, from ₦150.30 per US Dollar, a depreciation of 0.9 per cent compared to the level in 2009 (CBN Annual Report 2010). this could be attributed to weaker economic conditions in the developed economies, the proceeds from crude oil, decrease in home remittances and tourism which come mainly from sub saharan Africa. However this does not fully reflect in the movement of ASI for the eroded confidence of investors since the global financial crisis in 2008.

The response of Stock returns to Money supply was positive but very small and in fact dissipates to zero after the sixth period. The positive effect is expected as increase in money supply raise spending via the real balance effect, including on financial assets. This raises the stock prices, hence stock returns (see Abdul, 2008). This small magnitude of this response suggests that the bulk of the excess money supply in the hands of economic units are not spent on equity, rather on other assets. This implies that most of the increase in money supply in the short run is not necessarily channeled into the stock market. Investors may have other alternative means of investment in the economy. The movement of M2 was largely given by the expansion in domestic credit (net) of the Banking System, particularly credit to the federal Government. Quasi Money grew by 33.7 per cent in 2009 compared to 60 per cent at the end of Dec 2008. the growth in quasi money reflected largely the growth in time deposits especially the foreign currency

component with the DMBs. This development reflected the aggressive competition for deposits by DMBs as well as public preference for term deposit to equities following the crash of the stock market. Thereafter quasi money fell from 33.7 per cent in 2009 to 3.3 per cent in 2010 and then to 9.7 per cent in 2011 respectively. This could be attributed to the banking sectors reforms that took place within the period. This reduces the confidence of the public in the ability of the banking sector to manage their funds, thus investors move to other alternative forms of investmentments like real estates, FOREX among others.

The accumulated response of stock returns on interest rate was negative and constant. The effect of this is that as interest rate increases, it discourage the investors from borrowing funds from banks to buy equities in the stock market thus affects stock prices and returns. This implies that there an inverse relationship between stock returns and interest rate, which is consistent with the findings of Fama (1990), and Uddin and Alam (2007). the movement of lending rate rose from 4.3 per cent to 22.80 per cent in 2009. And from 22.80 per cent to 22.51 per cent in 2010 by 0.29 per cent points also it grew to 22.44 percent in 2011 by 0.1 per cent points (CBN Annual Report 2011). This reflect the tight liquidity condition and risk perception of borrowers by DMBs in the aftermath of the global and financial crisis in 2008. hence, this serve as a dis- incentive for investors to borrow funds from DMBs to invest in the stock market which lead to low stock prices and returns.

The variation of US prices has a positive and relatively higher impact on the stock returns among other macroeconomic variables in the study apart from the independent variable itself. It rose to a high of 0.03 in the fifth period only to decrease in the seventh period and remained stable to the twentieth period. Some factors that could be attributable to this is the fairly stable exchange rate operational in the economy, when Nigerias naira depreciates relative to another foreign currency,

there will be increasing cash flow into the economy, increase in trade volumes, share prices and stock returns. Secondly, Nigerian stock market is an emerging market full with potentials of growth. It was acclaimed one of the world's fastest growing market with about 74.5 percent growing rate in 2007. This boost investors confidence and awareness about the market. Rational investors from around the world can seize this opportunity to reap fast and higher returns by investing in the stock market.

The Trend Analysis Of ASI

An examination of Appendix 4 shows a rising trend of ASI in Nigeria during the period 2000-2012. A careful examination reveals that in 2001 month 1 was 5,752 and rose rapidly to 27,7308 in 2004 month 5 by per cent. This can be attributed to the bank capitilisation in the financial system, the review of regulatory and opeational guidelines in the bond market which initiated the process of e- bonus. This significantly helped in boosting the liquidity of the capital market. The period was also characterised by automation of processes which increased local and international awareness of opportunities in the Nigerian stock exchange. Thereafter it fell from the level 2004 month 6 to 20,682.4 in 2005 month 3.

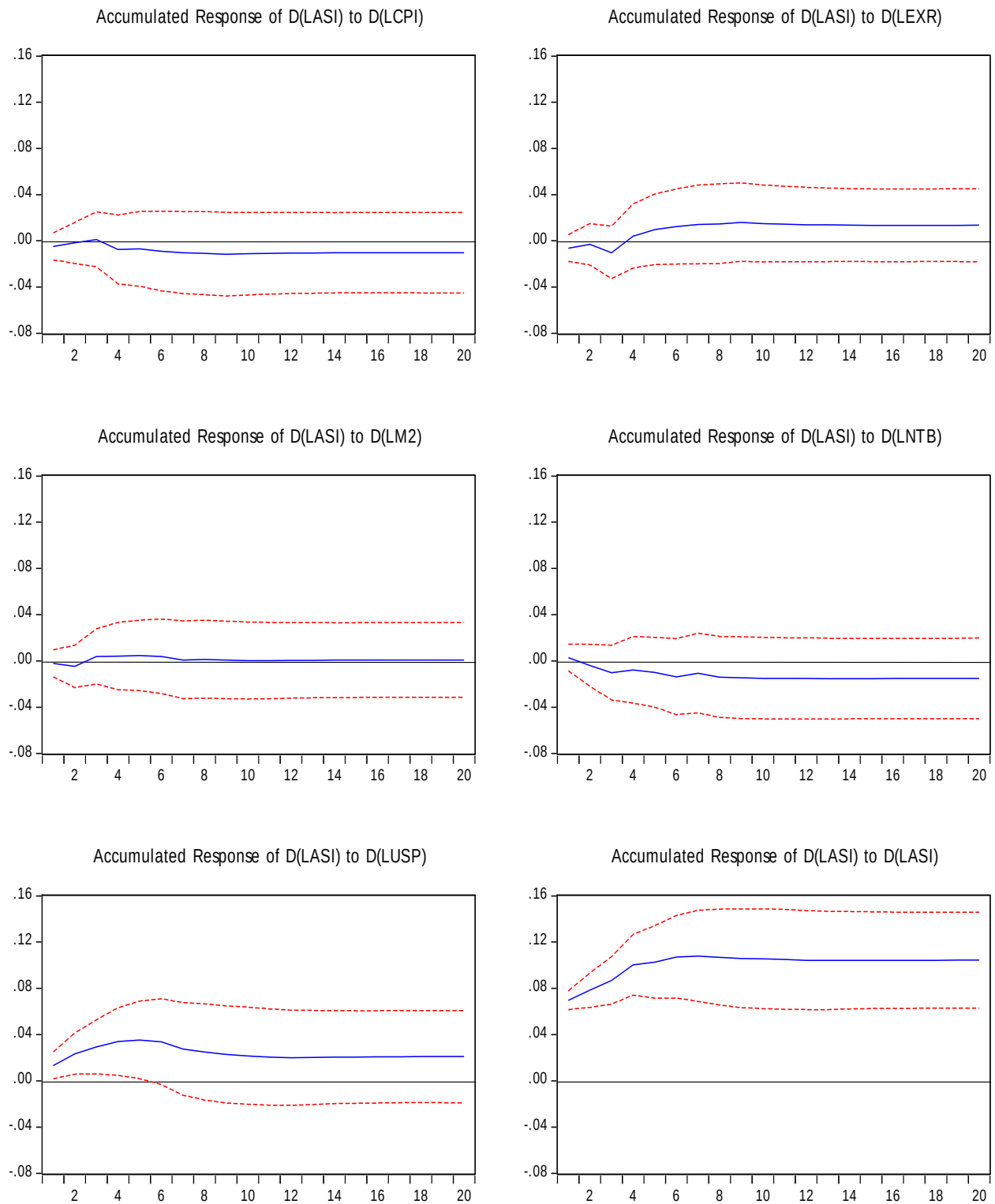
From 2005 month 3 activities in ASI sky rocketed and reached its peak level of 65,652.4 in 2008 month 2 was due to the high liquidity in the Banking and Insurance sector following the conclusion of the recapitalisation exercise which enable investors to float funds in stock exchange especially, through Margin lending. Secondly, there was low rate of returns on deposits in the Money market. Improvement in the macroeconomic enviroment in the country also attracted foreign investors in the market

Thereafter, the activities of ASI plummeted to 2009 month 1 at 21,813.8 by 3.64 percent. This event was attributed to wrong expectations/signals of price movements which led to panic, dumping of shares and asset switching, particularly into the real estate and money market security investments. Speculation and perceived uncertainties from global financial crunch also led to the divestment by Foreign portfolio investors in the economy.

Following the developments of ASI during the period from 2008 month 2 to 2009 month 1, the regulatory Authorities in the Financial sector deem it necessary to come up with policies that will help stabilise the market and buoy confidence of investors in the capital market. These policies include measures to ensure adequate liquidity in the market, reduction of transaction cost by regulators in the market, the buy- back policy, release of guidelines by SEC for market makers on the exchange, daily price movements was pegged at 1.0 percent for maximum downward movement and 5.0 percent limit for upward movement among others.

Fig 4.2: IMPULSE RESPONSE FUNCTION

Accumulated Response to CholeskyOne S.D. Innovations ± 2 S.E.



4.5.2 Variance Decomposition

To give some detailed insight into the finding of VAR model, the variance decomposition (VD) and impulse response functions (IRF) were estimated. The result of the variance decomposition analyses for LASI on the explanatory variables is reported in Table 4.4.1 while the rest of the result can be found in Appendix VIII. The reported figure indicates the percentage of movements in the All share index that can be attributed to its own shock and the shock to the other macroeconomic variables in the system. These are provided for five different lagged time phases. One month, five, ten, fifteen and twenty periods (short run). The VD results suggest that Stock returns are highly persistent, in agreement with the literature showing volatility clustering. Indeed, over the 20 period horizon, own-shock contributes to between 95 and 82% of variations in stock returns. Apart from own shocks, the most important variables accounting for variation in stock returns are respectively US stock prices index (representing the global economy, or the state of global finance), Exchange rate, interest rate, and then inflation. Domestic Money supply appears to contribute least to the variation in the stock returns. This result, along with that of the IRFs above suggest that external factor appear to be more important than domestic variables in explaining the variation on stock returns in Nigeria. This suggest that the Nigerian Stock Market is prone to the international contagion effect.

TABLE 4.4.2: VARIANCE DECOMPOSITION

Variance Decomposition of D(LASI):

	S.E.	D(LCPI)	D(LEXR)	D(LM2)	D(LNTB)	D(LUSP)	D(LASI)
1	0.071511	0.455310	0.792710	0.088354	0.169078	3.455817	95.03873
2	0.073256	0.594344	0.959139	0.220568	1.039906	5.229822	91.95622
3	0.075152	0.731311	1.840783	1.562463	1.676737	5.552926	88.63578
4	0.078365	1.925512	5.038530	1.438163	1.622194	5.474428	84.50117
5	0.078654	1.916415	5.540435	1.430921	1.670787	5.464400	83.97704
6	0.078953	1.961756	5.605992	1.429380	1.892687	5.462933	83.64725
7	0.079355	1.968482	5.596136	1.562095	2.020511	6.040520	82.81226
8	0.079477	1.966688	5.585429	1.562137	2.190154	6.121058	82.57453
9	0.079534	1.975162	5.603610	1.567356	2.194683	6.185709	82.47348
10	0.079555	1.976831	5.621351	1.569735	2.195403	6.204935	82.43174
11	0.079567	1.977689	5.622934	1.569329	2.194905	6.223237	82.41191
12	0.079575	1.978477	5.627174	1.569219	2.194494	6.228017	82.40262
13	0.079577	1.978459	5.627019	1.569660	2.196005	6.229701	82.39916
14	0.079577	1.978570	5.627410	1.569641	2.196079	6.230273	82.39803
15	0.079578	1.978819	5.628540	1.569767	2.196089	6.230537	82.39625
16	0.079579	1.978817	5.628528	1.569807	2.196256	6.230658	82.39593
17	0.079579	1.978809	5.628523	1.569834	2.196248	6.231006	82.39558
18	0.079579	1.978819	5.628564	1.569828	2.196242	6.231210	82.39534
19	0.079579	1.978818	5.628561	1.569833	2.196265	6.231208	82.39532
20	0.079579	1.978818	5.628563	1.569833	2.196265	6.231208	82.39531
Cholesky Ordering: D(LCPI) D(LEXR) D(LM2) D(LNTB) D(LUSP) D(LASI)							

Source: Author's Computation

4.6 Causality Test Result

The summary of granger causality test results is shown in Table 4.5. We reject the null hypothesis and accept the alternative that stock returns granger cause interest rate, however from the result interest rate does not granger-cause stock returns. This implies that there is only a unidirectional relationship running from stock returns to interest rate, thus stock returns can predict changes in interest rate.

From the result, the null hypothesis is rejected that inflation does not granger cause interest rate. We are accepting the null hypothesis that interest rate does not granger cause inflation. This implies that when there is excess liquidity in the system, investors tend to invest their money in the equity market.

There is a bi-directional relationship between US stock prices and Exchange rate. It shows that US prices can predict the changes in Nigeria exchange rates. Assuming there is an inflow of investors funds into the Nigerian capital market, due to high demand for naira will cause exchange rate to increase. This will have a ripple effect on the value of naira.

There is also unidirectional relationship between Money supply and interest rate. The implication of this is that Money supply can predict changes in interest rate. When there is an increase in liquidity in the system, investors have an incentive to invest in the stock market provided interest rates are low.

Table 4.6: SUMMARY OF CAUSALITY TEST RESULT

NULL HYPOTHESIS	F-STATISTICS	PROBABILITY
LNTB does not granger cause LASI	0.54298	0.46236
LASI does not granger cause LNTB	5.12537	0.02502
LNTB does not granger cause LCPI	0.05783	0.81028
LCPI does not granger cause LNTB	5.05154	0.02607
LUSP does not granger cause LEXR	12.8329	0.00046
LEXR does not granger cause LUSP	5.90175	0.01632
LNTBdoes not granger cause LM2	0.36259	0.54798
LM2 does not granger cause LNTB	5.83665	0.01691

Source: Author's Computation

Note: F-statistic is significant at 5% (0.05)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION(S)

5.1 Summary

The APT model suggests that macroeconomic variables have impact on stock returns. The research carried out the empirical testing of the influence of macroeconomic variables on stock returns in Nigeria. The ultimate goal is to see if these macroeconomic variables (Money supply, Inflation, Exchange rate, Interest rate) and US stock price as a control variable to capture the effects of the state of global economy on the stock return in Nigeria for the period under study. The macroeconomic data series were found to be non-stationary and were made stationary after differencing them once, meaning they are all $I(1)$. A test of cointegration shows the existence of long-run relationship between stock returns and macroeconomic variables. This is because the ECM coefficient of the Stock returns was positive and statistically insignificant. This implies that equilibrium cannot be restored back by errors in the past. Hence we examined the short run dynamic relationship between stock returns and macroeconomic variables using the VAR model estimated in first difference. Findings reveal that Exchange rate and US price contributes higher in the variation of ASI in the short run. This, we argue suggest that external factors are more important than domestic variable in determining stock returns in Nigeria. This also suggests the Nigeria's financial market is fairly open to the rest of the world and that their influence is important. Specifically, it indicates that inflation and interest rate have a negative relationship with stock returns in the short run, exchange rate and US stock prices have a positive relationship with Stock returns while Money supply has a positive but insignificant relationship with stock returns, this could be that investors channel their investment funds to other alternative ways e.g portfolio investment, bonds, real estate investment etc in the short run. The granger causality test

also shows unidirectional relationship between Stock returns and interest rate, inflation and interest rate, money supply and interest rate while a bi-directional relationship exist between US stock prices and Exchange rate. This clearly shows that a change in US stock prices can impact significantly on Exchange rate and vice versa.

5.2. Conclusions

In line with the growing literatures in the emerging market economies like Sardar et al (2004), Abdul (2008), we expect to find a long-run equilibrium relationship between macroeconomic variables and stock returns. Since most of the time series of the macroeconomic variable are not stationary. The VECM results indicated that we forced to reject our null hypothesis that there is no long-run relationship between macroeconomic variables (CPI, Exchange rate, Inflation rate, Money supply and US Stock prices) and stock returns but disequilibrium will result from incorrective mechanism of the past errors unto the present error. Therefore, we investigated the short-run and dynamic relationship between the macroeconomic variables and stock returns using the VAR model. The result indicated that Stock returns is more responsive to changes in US prices and Exchange rate among the other variables. Hence the following conclusions can be drawn: first, stock returns in Nigeria are largely determined by global macroeconomic developments. Secondly, the Nigerian stock market is significantly open to international economy, thus exposing it to the risks associated with international capital movements. This conclusion is supported by the recent collapse of the market following the international financial crisis that started in the USA. Fourthly, the relative importance of the exchange rate also implies that exchange rate policy can have some effects on the stability of the market.

5.3 Recommendations

Based on the empirical findings of the study we recommend that;

- Authorities should be watchful of its policy on the internationalization of the stock market through privatization and commercialization of government enterprise because doing so would further render key domestic policy variables ineffective in fine-tuning the behavior of the stock market
- The monetary authority should be mindful of regulating and maintaining the exchange rate suitable for investment because it only not affect the external sector of the economy but also contribute in the variation of stock returns.
- There is need for the government to strengthen political and social stability in the economy to boost the confidence of prospectus investors abroad.
- There is information asymmetry with regards to exploiting the full potentials of stock market so therefore the Securities and Exchange Commission should continuously enlighten the general public on the incentives of investing with the stock market.

REFERENCES

- Abdul, R (2008). "Macroeconomic Variables and Stock Exchange Performance". *International institute of Islamic economics, MPRA paper* No 26937 Nov 2010.
- Abraham T. W (2009). "A descriptive analysis of the response of the Nigerias Stock exchange to Global policy Actions" NES presentation paper at the 50th Annual conference 28-30th September, 2009, Nicon luxury hotel Abuja
- Abraham, T. M. (ND). "Stock market reaction to selected macroeconomic variables in the Nigerian Economy". *CBN Journal of Applied Statistics*. 2(1).
- Adeyimi K, S (1998). "Option for effective development of Nigeria's Capital Market" at One day seminar organized by NES at *the Institute of International Journal Affairs*, Lagos
- Adrangi B, Charath A, Shank MT (1999). "Inflation, Output and Stock Prices: Evidence from Latin America", *Manage. Decis. Econ* 20(2): 63-74.
- Alam, Md. M., Uddin, Md. G.S. (2009), "Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries". *International Journal of Business and Management*, 4, 43-51.
- Aliyu (ND). "Stock prices and Exchange rate interactions in Nigeria: An intra-Global financial crisis maiden investigation". NES presentation paper at the 50th Annual conference 28-30th September, 2009, Nicon luxury hotel Abuja
- Aliele and Anao (1986): "The Nigerian stock exchange market in Operation". Jen Meviho and Associate Ltd.
- Aroni J. M (2011), "Factors influencing stock prices for firms listed on the Nairobi exchange", *International Journal of Business and social sciences*, 2: 303-311.
- Armstrong F, E (1994). "The Capital market operations". Seminar presented in UNEC 21st march, 1993.
- Arodoye, N. L. (2012), "An Econometric analysis of the impact of macroeconomic variables on stock prices in Nigeria: A VAR model analysis". *International Review of Business and Social Sciences*. 1(8): 63-77.
- Azeez, A. A & Yenewa, Y (2003). "Macroeconomic factors and the empirical content of the Arbitrage Pricing Theory in the Japanese stock market" *Japan and the World*, p1-24.
- Andreas Humpe and Peter Macmillian (2007), "Can macroeconomic variables explain long term stock market movements? A comparison of the US and Japan". *Center for Dynamic Macroeconomic analysis working paper series*. 7(20).

Butt B. Z., Kashif U. R., Khan M. A., and Nadeem S. (2010) “Do economic factors influence stock returns? A firm and industry level analysis” *African Journal of Business Management* Vol. 4(5), pp. 583-593, May 2010 Available online at <http://www.academicjournals.org/AJBM>

Central Bank of Nigeria “CBN Annual Report 2009, 2010 and 2011”

Chen, N., Roll, R., Ross, S.A. (1986), “Economic Forces and the Stock Market”. *Journal of Business*, 59, 383–403.

Cheung, Y.W., Ng, L.K. (1998),”International Evidence on the Stock Market and Aggregate Economic Activity”. *Journal of Empirical Finance*. 5, 281–296.

Durai ,S. R., Bhaduri, S. (2009), “Stock Prices, inflation and output: Evidence from Wavelet Analysis”, *Journal of Economic Modelling*, 26 : 1089-1092.

Emerike, K. O. and Odili, O. (2014), “Stock market returns volatility and macroeconomic Variables in Nigeria”. *International Journal of Empirical Finance*, 2(2): 75-82.

Emeka Nkoro and Aham Kelvin Uko (2013),” A Generalized Autoregressive Conditional Heteroskedasticity Model of the Impact of Macroeconomic Factors on Stock returns: Empirical evidence from the Nigerian stock market”, *International Journal of Financial Research*. 4(4).

Fama, E.F. (1981),” Stock Returns, Real Activity, Inflation and Money”, *The American Economic Review*, 71, 545–565.

Fama, E.F. (1990), Stock Returns, Expected Returns, and Real Activity. *Journal of Finance*, 45, 1089– 1108.

Federal office of statistics statistical bulletin (various issues).

Feldstein, M. (1982), “Government Deficits and Aggregate Demand”, *Journal of Monetary Economics*, 9, 1-20.

Ferson, Wayne E., and Campbell, R. Harvey (1991),”The variation of Economic risks Premiums”, *Journal of political economy* 99:385-415.

Fisher, I. (1930), *The Theory of Interest*. New York: Macmillan.

Fitfield, S. G. M, Power, D. M and Sinclair, C.D (2002), “Macroeconomic factors and share returns: An analysis using emerging market data”, *International Journal of Finance and Economics*, Vol 7, pp. 51-62

- Flannery, M. I., and A. A. Protopapadakis (2002), "Macroeconomic factors do increase Aggregate stock return", *Review of financial studies*, 15: 751-789.
- Geske, R. and Roll, R. (1983), "The fiscal and monetary linkage between stock returns and inflation", *Journal of Finance* 38(1): 1-33
- Gjerde, O. and F. Sættem (1999), "Causal relations among stock returns and Macroeconomic variables in a small open economy", *Journal of International Finance, Markets money*, 9: 61-74.
- Gujarati, and Damodar, N. (2010). *Essentials of Econometrics* 5th ed., McGraw-Hill, New York.
- Gupta, R., and Modise, M.P. (2011), "Macroeconomic Variables and South African Stock Return Predictability", Working paper.
- Harvey, C. R. (1995), "The Risk exposure of Emerging Market", *The World Bank Economic review*, 9:19-50.
- Husam, R., Turgat T., and Nil G. (2009), "The effect of Macroeconomic factors on Stock returns: Istanbul stock market", *Studies in Economic and Finance*, 26(1): 36-45.
- Hylbert, R.. C. (2008), "Investment opportunities in times of financial crisis", *The wall struck journal. 2008*
- Haruna Issahaku, Yazidu Ustarz and Paul Bata Domanba (2013), "Macroeconomic variables and stock returns in Ghana: any causal link?", *Asian Economic and Financial Review*, 3(8): 1044-1062.
- Ifuero Osad Osumwonyi and Esther Ikavbo Evbayiro-Osagie (2012), "The relationship between macroeconomic variables and stock returns index in Nigeria", *Journal of Economics*, 3(1):55-63.
- Johansen, S. (1998), "Statistical analysis for integrating vectors", *Journal of economic dynamic and control*. 12: 231-254.
- Johansen, S. and Thomas, S. H (1988), "Statistical analysis of cointegration vectors", *Journal of economic Dynamics and control*, 12 : 231-254
- Johansen, S. (1991), "Estimation and Hypothesis testing of cointegration vectors in Gaussian vector autoregressive models", *Econometrica* , 59(6):1551- 1580.
- Johansen, S. and Juselius, K. (1990), "Maximum likelihood estimation and influence on cointegration- with application to the demand for money", *Oxford bulletin of Economics and Statistics*, 51: 169-210.
- Kuwurnu J. K. M. (2102).
- Mayewa, G. O. and Osenyomon, E. H. (2010), "The predictive contents of some leading Economic indicators on stock price", *Journal of Research in National development* 8(1)

- Maysami, R. C., Loo, S. W., and Koh, T. K. (2004), "Co-movement among sectoral stock market indices and cointegration among dually listed companies", *JurnalPengurusan*, 23:33-52.
- Mayasami, R. C. and Koh, T. S. (2000), "A vector error correction model of the Singapore stock market", *International Review of Economics and Finance*, 9: 79-96
- Md. ZobaerHasan, Anton AbdulbasahKamil and AzizulBaten (2011), "Measuring Dhaka stock exchange Market efficiency: A stochastic frontier analysis", *African Journal of Business Management*, 5(22): 8891-8901. <http://www.academicjournals.org/AJBM>
- Melina, A. A., and Hasyaliniy, S. (2011), "The preparation towards Asean exchange link between Malaysia Stock Market and Asian countries Macroeconomic variables interdependency", *International journal of business & social science* , 2(5).
- Mohammed, B. A. (2011), "Impact of microeconomic and macroeconomic variables on emerging stock market return: a case on Dhaka Stock Exchange", *interdisciplinary journal of research inbusiness*, 1(5): 08-16
- Moore, H. (1962), "Stock prices and the business cycle", *.Journal of portfolio Management*, 1: 59-64.
- Mukherjee, T. K., and Naka, A. (1995), "Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model", *Journal of Financial Research*, Vol 18, 223–37.
- Noor, A. A., and H. Sulong (2011), "The preparation towards Asean exchange link between Malaysian stock market and Asian countries, macroeconomic variables interdependency", *International journal of business and social science*, 2(5)..
- Oguzhan, A., and Erdal, D. (2009), "The relationship between stock prices and exchange rates- Evidence from Tuekey", *International research journal of finance and economics*. Issue 23 (2009).
- Okafor, F. (1999), *Investment Decisions: Evaluation for Projects and Securities* London Cassel ltd.
- Ologunde, A. O., Elumilade, D. O., and T. O. Asaolu (2006), "Stock market capitalization and interest rate in Nigeria,A time series analysis". *International research journal of finance & economics*. Issue 4-2006.
- Pesaran and Shin (1995, 1998), "An autoregressive distributed lag modeling approach to cointegration analysis", *DAE working papers*, No 9514.
- Pesaran et al (1996), "Testing for the existence of a longrunrelationship", *DAE working papers*, No 9622.
- Pramod , K. M. and Piya, P. (2012), "The Impact of macroeconomic fundamentals on stock prices Revisited: evidence from Indian data", *Eurasian Journal of Business and Economics*, 5(10): 25-44.

- Ramin, C. M., Lee, C. H., & Mohamad, A. H (2004), "Relationship between macroeconomic variables and stock market indices: Cointegration evidence from stock exchange of Singapore's All- S Sector indices", *Jurnal Pengukuran* 24 (2004) pp 47-77.
- Ross, S. A. (1976), "The arbitrage theory of capital asset pricing", *Journal of Economic Theory* 13: 341-360
- Sadar, M. N, Islam, S. W., and Nick, B. (2004), "A time series analysis and modeling of the Thai Stock market International business management conference, 2004.
- Securities & Exchange Commissions statistical bulletin (various issues).
- Sharpe, W. F. (1964), "A Simplified Model for Portfolio Analysis" *Journal of Management Sci.* 9(1): 277-293
- Smith, K., and Sims, A. (1993), "Stock market performance and macroeconomic variables", *Applied financial economics*, 3: 55- 60
- Smith, L. H. (1990), "Stock price behavior in the American economy", *American economic review*, 71: 429-450
- Soyode, A. (2009), "Nigerian capital market and macroeconomic variables: an empirical analysis", *Nigerian journal of monetary economics*, 6.
- Sulaiman, D. M., Adnan, H., & Adnan, A. (2009), "The impact of macroeconomic variables on stock prices: Empirical evidence in case of KSE", *European journal of scientific research*, 38(1): 96-103
- Sally Saliha Abdulrahim (2011), "Nigerian stock returns and macroeconomic variables: evidence from the APT", MBA, Eastern Mediterranean University, Gazimagusa, North Cyprus.
- Schwartz, W. G. (1989), "Business cycles, financial crisis and stock volatility", *Carnegie-Roberts conference series on public policy*, 31: 83-126
- Saeed, S., Ozra, B. and Meysam, G. (2012), "The relationship between macroeconomic variables And stock returns in the Tehran stock exchange", *International Journal of Academic Research in Business and Social Sciences*. 2(6)
- Uddin, M., Alam, M.M., (2007), "The Impacts of Interest Rate on Stock Market: Empirical Evidence from Dhaka Stock Exchange", *South Asian Journal of Management Science*, (2): 123 -132
- Wang, G., and Lim, C. (2010), "Effects of Macroeconomic Factors on Share Prices", *Journal of International Finance & Economics*, 10: 113-123.
- Wang, L. K., & Liow, K. H. (1999), "The behaviour of Singapore property stocks to market and interest rate risks", *SES Journal* 1999:28-34
- Yui Xia Guo (2008), "The efficiency of the Chinese stock market with respect to Monetary policy", *School of economics & management*.

APPENDICES

APPENDIX 1: COINTEGRATION RESULT

1 Cointegrating Equation(s): Log likelihood 1360.680

Normalized cointegrating coefficients (std.err. in parentheses)

LASI	LEXR	LUSP	LM2	LNTB	LCPI
1.000000	25.52754	8.678811	2.822319	-0.513508	-14.15329
	(3.93058)	(1.47064)	(1.10652)	(0.26597)	(3.00286)

Adjustment coefficients (std.err. in parentheses)

D(LASI)	0.017765
	(0.00567)
D(LEXR)	-0.006189
	(0.00117)
D(LUSP)	-0.000458
	(0.00371)
D(LM2)	-0.002037
	(0.00448)
D(LNTB)	0.042737
	(0.04197)
D(LCPI)	0.002272
	(0.00163)

2 Cointegrating Equation(s): Log likelihood 1370.437

Normalized cointegrating coefficients (std.err. in parentheses)

LASI	LEXR	LUSP	LM2	LNTB	LCPI
1.000000	0.000000	10.46601	1.771965	0.239983	-7.361812
		(2.97203)	(2.66932)	(0.73686)	(5.59728)
0.000000	1.000000	-0.070011	0.041146	-0.029517	-0.266045
		(0.11464)	(0.10297)	(0.02842)	(0.21591)

Adjustment coefficients (std.err. in parentheses)

D(LASI)	0.017865	0.449295
	(0.00578)	(0.15257)
D(LEXR)	-0.006069	-0.163010
	(0.00119)	(0.03135)
D(LUSP)	-0.003114	0.099218
	(0.00362)	(0.09544)
D(LM2)	-0.000210	-0.128284
	(0.00451)	(0.11896)
D(LNTB)	0.032901	1.501752
	(0.04265)	(1.12502)
D(LCPI)	0.002405	0.052428
	(0.00167)	(0.04396)

3 Cointegrating Equation(s): Log likelihood 1379.206

Normalized cointegrating coefficients (std.err. in parentheses)

LASI	LEXR	LUSP	LM2	LNTB	LCPI
1.000000	0.000000	0.000000	3.261234	1.812029	-6.808528
			(1.65481)	(0.45234)	(3.45763)

0.000000	1.000000	0.000000	0.031184 (0.09154)	-0.040033 (0.02502)	-0.269746 (0.19127)
0.000000	0.000000	1.000000	-0.142296 (0.24016)	-0.150205 (0.06565)	-0.052865 (0.50181)

Adjustment coefficients (std.err. in parentheses)

D(LASI)	0.012737 (0.00824)	0.409556 (0.15885)	0.155973 (0.05145)
D(LEXR)	-0.006701 (0.00170)	-0.167907 (0.03269)	-0.052052 (0.01059)
D(LUSP)	-0.003172 (0.00517)	0.098768 (0.09963)	-0.039536 (0.03227)
D(LM2)	-0.004516 (0.00642)	-0.161653 (0.12380)	0.007165 (0.04010)
D(LNTB)	-0.110707 (0.05856)	0.389037 (1.12881)	0.251817 (0.36558)
D(LCPI)	0.005237 (0.00236)	0.074367 (0.04544)	0.021255 (0.01472)

4 Cointegrating Equation(s): Log likelihood 1385.598

Normalized cointegrating coefficients (std.err. in parentheses)

LASI	LEXR	LUSP	LM2	LNTB	LCPI
1.000000	0.000000	0.000000	0.000000	0.615142 (0.23662)	0.208926 (0.40534)
0.000000	1.000000	0.000000	0.000000	-0.051477 (0.02659)	-0.202646 (0.04555)
0.000000	0.000000	1.000000	0.000000	-0.097982 (0.06441)	-0.359054 (0.11033)
0.000000	0.000000	0.000000	1.000000	0.367004 (0.11666)	-2.151779 (0.19985)

Adjustment coefficients (std.err. in parentheses)

D(LASI)	-0.004354 (0.01231)	0.431751 (0.15744)	0.151187 (0.05090)	0.056743 (0.02904)
D(LEXR)	-0.010373 (0.00253)	-0.163139 (0.03237)	-0.053081 (0.01047)	-0.014392 (0.00597)
D(LUSP)	-0.004410 (0.00781)	0.100375 (0.09990)	-0.039883 (0.03230)	0.000143 (0.01843)
D(LM2)	-0.000683 (0.00970)	-0.166632 (0.12404)	0.008239 (0.04011)	-0.026314 (0.02288)
D(LNTB)	-0.136430 (0.08844)	0.422442 (1.13150)	0.244612 (0.36586)	-0.347673 (0.20869)
D(LCPI)	0.000416 (0.00352)	0.080628 (0.04505)	0.019905 (0.01457)	0.023320 (0.00831)

5 Cointegrating Equation(s): Log likelihood 1388.504

Normalized cointegrating coefficients (std.err. in parentheses)

LASI	LEXR	LUSP	LM2	LNTB	LCPI
1.000000	0.000000	0.000000	0.000000	0.000000	0.296447 (0.46921)
0.000000	1.000000	0.000000	0.000000	0.000000	-0.209970 (0.03783)
0.000000	0.000000	1.000000	0.000000	0.000000	-0.372995

					(0.11581)
0.000000	0.000000	0.000000	1.000000	0.000000	-2.099562
					(0.16098)
0.000000	0.000000	0.000000	0.000000	1.000000	-0.142279
					(0.54688)
Adjustment coefficients (std.err. in parentheses)					
D(LASI)	-0.008620	0.417109	0.141562	0.012561	-0.014614
	(0.01254)	(0.15651)	(0.05091)	(0.04117)	(0.00984)
D(LEXR)	-0.010431	-0.163339	-0.053212	-0.014996	0.001994
	(0.00260)	(0.03243)	(0.01055)	(0.00853)	(0.00204)
D(LUSP)	-0.006338	0.093756	-0.044234	-0.019830	-0.001985
	(0.00799)	(0.09970)	(0.03243)	(0.02622)	(0.00627)
D(LM2)	-0.002303	-0.172195	0.004582	-0.043100	-0.000681
	(0.00994)	(0.12406)	(0.04036)	(0.03263)	(0.00780)
D(LNTB)	-0.115862	0.493052	0.291027	-0.134617	-0.277868
	(0.09048)	(1.12973)	(0.36750)	(0.29714)	(0.07100)
D(LCPI)	0.001240	0.083457	0.021764	0.031856	0.001887
	(0.00360)	(0.04498)	(0.01463)	(0.01183)	(0.00283)

APPENDIX 2: VECM Lag Order Selection Criteria

VAR Lag Order Selection Criteria

Endogenous variables: D(LCPI) D(LEXR) D(LM2) D(LNTB) D(LUSP) D(LASI)

Exogenous variables: C

Date: 11/01/12 Time: 10:10

Sample: 2000M01 2012M12

Included observations: 144

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1231.248	NA	1.64E-15	-17.01734	-16.89360*	-16.96706*
1	1272.141	77.80889	1.53E-15*	-17.08529*	-16.21909	-16.73331
2	1299.454	49.69509	1.73E-15	-16.96464	-15.35599	-16.31097
3	1337.032	65.23971*	1.71E-15	-16.98655	-14.63545	-16.03120
4	1357.800	34.32511	2.13E-15	-16.77500	-13.68145	-15.51795
5	1383.558	40.42593	2.51E-15	-16.63275	-12.79674	-15.07402
6	1404.079	30.49556	3.20E-15	-16.41776	-11.83930	-14.55733
7	1421.944	25.06108	4.30E-15	-16.16589	-10.84497	-14.00377
8	1447.641	33.90581	5.25E-15	-16.02279	-9.959422	-13.55898

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

APPENDIX 3: VEC RESULT

Vector Error Correction Estimates

Date: 10/24/12 Time: 17:01

Sample(adjusted): 2000M03 2012M09

Included observations: 151 after adjusting endpoints

Standard errors in () & t-statistics in []

CointegratingEq:	CointEq1					
LASI(-1)	1.000000					
LEXR(-1)	25.52754 (3.93058) [6.49459]					
LUSP(-1)	8.678811 (1.47064) [5.90140]					
LM2(-1)	2.822319 (1.10652) [2.55063]					
LNTB(-1)	-0.513508 (0.26597) [-1.93073]					
LCPI(-1)	-14.15329 (3.00286) [-4.71327]					
C	-177.5206					
Error Correction:	D(LASI)	D(LEXR)	D(LUSP)	D(LM2)	D(LNTB)	D(LCPI)
CointEq1	0.017765 (0.00567) [3.13504]	-0.006189 (0.00117) [-5.31155]	-0.000458 (0.00371) [-0.12368]	-0.002037 (0.00448) [-0.45454]	0.042737 (0.04197) [1.01816]	0.002272 (0.00163) [1.39083]
D(LASI(-1))	0.039579 (0.08741) [0.45280]	-0.003824 (0.01797) [-0.21275]	0.084191 (0.05717) [1.47262]	0.070204 (0.06911) [1.01578]	0.041488 (0.64748) [0.06408]	-0.007191 (0.02520) [-0.28537]
D(LEXR(-1))	0.056711 (0.35281) [0.16074]	0.266691 (0.07255) [3.67598]	-0.262591 (0.23075) [-1.13797]	-0.110903 (0.27896) [-0.39756]	-0.703908 (2.61340) [-0.26935]	0.045795 (0.10171) [0.45027]
D(LUSP(-1))	0.047148 (0.13753) [0.34283]	0.026991 (0.02828) [0.95441]	0.117632 (0.08995) [1.30776]	-0.127177 (0.10874) [-1.16956]	-0.893721 (1.01872) [-0.87730]	0.008481 (0.03965) [0.21391]
D(LM2(-1))	-0.102562 (0.10399) [-0.98630]	0.015577 (0.02138) [0.72845]	0.040648 (0.06801) [0.59765]	-0.191688 (0.08222) [-2.33138]	0.564631 (0.77028) [0.73302]	0.011008 (0.02998) [0.36723]

D(LNTB(-1))	-0.002267 (0.01041) [-0.21774]	-0.002259 (0.00214) [-1.05506]	0.000730 (0.00681) [0.10713]	-0.006172 (0.00823) [-0.74962]	-0.393163 (0.07714) [-5.09690]	-0.001081 (0.00300) [-0.36004]
D(LCPI(-1))	0.308250 (0.28979) [1.06369]	-0.089228 (0.05959) [-1.49732]	0.217236 (0.18954) [1.14612]	0.014141 (0.22914) [0.06171]	-2.196463 (2.14663) [-1.02321]	-0.085160 (0.08354) [-1.01939]
C	0.008151 (0.00685) [1.18923]	0.002792 (0.00141) [1.98099]	-0.002671 (0.00448) [-0.59571]	0.023064 (0.00542) [4.25572]	0.010383 (0.05077) [0.20450]	0.010741 (0.00198) [5.43630]
R-squared	0.108904	0.278631	0.059351	0.061813	0.183371	0.030650
Adj. R-squared	0.065284	0.243320	0.013305	0.015888	0.143396	-0.016801
Sum sq. resids	0.733927	0.031035	0.313967	0.458844	40.27125	0.060991
S.E. equation	0.071640	0.014732	0.046857	0.056645	0.530676	0.020652
F-statistic	2.496660	7.890616	1.288962	1.345958	4.587153	0.645926
Log likelihood	187.9005	426.7295	252.0092	223.3627	-114.4757	375.7202
Akaike AIC	-2.382788	-5.546086	-3.231910	-2.852486	1.622195	-4.870466
Schwarz SC	-2.222932	-5.386230	-3.072054	-2.692631	1.782051	-4.710610
Mean dependent	0.009763	0.002988	0.000350	0.019647	-0.001905	0.010173
S.D. dependent	0.074100	0.016936	0.047172	0.057101	0.573376	0.020481
Determinant Residual Covariance	8.32E-16					
Log Likelihood	1360.680					
Log Likelihood (d.f. adjusted)	1336.021					
Akaike Information Criteria	-16.98041					
Schwarz Criteria	-15.90139					

APPENDIX 4: VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria

Endogenous variables: LASI LEXR LUSP LM2 LNTB LCPI

Exogenous variables: C

Date: 10/24/12 Time: 16:59

Sample: 2000M01 2012M12

Included observations: 145

Lag	LogL	LR	FPE	AIC	SC	HQ
0	92.46187	NA	1.22E-08	-1.192577	-1.069402	-1.142527
1	1305.576	2309.101	1.09E-15*	-17.42864*	-16.56641*	-17.07829*
2	1332.628	49.25214	1.23E-15	-17.30521	-15.70393	-16.65456
3	1357.970	44.04287	1.44E-15	-17.15820	-14.81788	-16.20725
4	1390.185	53.32235*	1.53E-15	-17.10601	-14.02663	-15.85475
5	1414.586	38.36769	1.83E-15	-16.94601	-13.12758	-15.39446
6	1435.902	31.75318	2.31E-15	-16.74347	-12.18599	-14.89161
7	1459.453	33.13467	2.86E-15	-16.57177	-11.27524	-14.41961
8	1481.060	28.61019	3.68E-15	-16.37324	-10.33766	-13.92078

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion

APPENDIX 5: VAR RESULT

Vector Autoregression Estimates

Date: 11/01/12 Time: 10:13

Sample(adjusted): 2000M05 2012M09

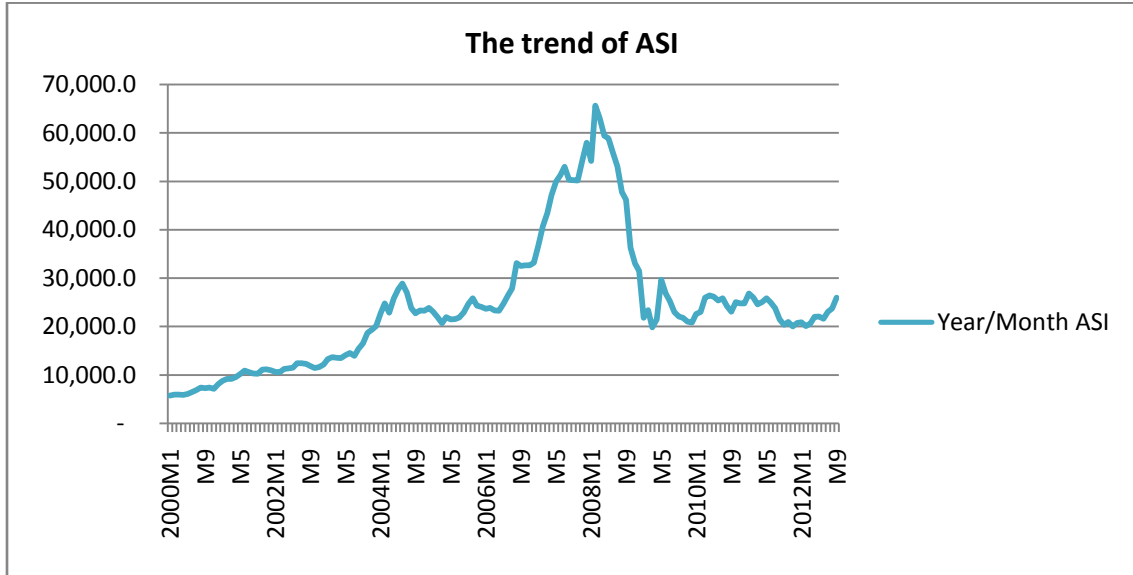
Included observations: 149 after adjusting endpoints

Standard errors in () & t-statistics in []

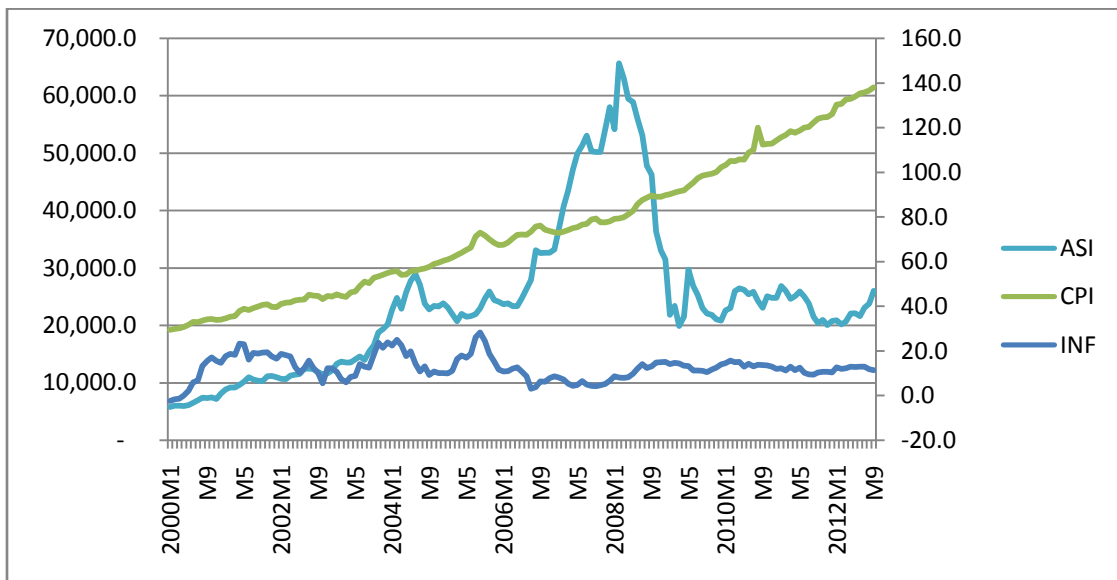
	D(LCPI)	D(LEXR)	D(LM2)	D(LNTB)	D(LUSP)	D(LASI)
D(LCPI(-1))	0.002333 (0.08303) [0.02809]	-0.046560 (0.06464) [-0.72034]	0.093915 (0.23912) [0.39275]	-2.010340 (2.24686) [-0.89473]	0.156270 (0.19429) [0.80429]	0.218646 (0.30307) [0.72143]
D(LCPI(-2))	-0.044206 (0.08152) [-0.54224]	-0.004642 (0.06346) [-0.07314]	0.318657 (0.23477) [1.35729]	-3.499179 (2.20602) [-1.58620]	-0.135631 (0.19076) [-0.71099]	0.080949 (0.29756) [0.27204]
D(LCPI(-3))	-0.103967 (0.08216) [-1.26547]	-0.025479 (0.06395) [-0.39839]	-0.297319 (0.23660) [-1.25666]	-0.213271 (2.22313) [-0.09593]	0.030978 (0.19224) [0.16114]	-0.602954 (0.29987) [-2.01070]
D(LEXR(-1))	0.071717 (0.10878) [0.65930]	0.206788 (0.08468) [2.44212]	-0.066307 (0.31326) [-0.21167]	-0.422107 (2.94347) [-0.14340]	-0.121231 (0.25453) [-0.47629]	0.243353 (0.39704) [0.61292]
D(LEXR(-2))	0.034949 (0.10889) [0.32097]	-0.034152 (0.08476) [-0.40292]	-0.207789 (0.31357) [-0.66266]	0.482447 (2.94640) [0.16374]	-0.225440 (0.25479) [-0.88482]	-0.567922 (0.39743) [-1.42898]
D(LEXR(-3))	0.002182 (0.10224) [0.02135]	-0.118111 (0.07958) [-1.48409]	-0.081678 (0.29442) [-0.27742]	-2.742507 (2.76650) [-0.99133]	0.582277 (0.23923) [2.43396]	1.214409 (0.37316) [3.25435]
D(LM2(-1))	0.023911 (0.03071) [0.77868]	-0.015268 (0.02390) [-0.63872]	-0.274530 (0.08843) [-3.10447]	0.287671 (0.83093) [0.34621]	0.037963 (0.07185) [0.52833]	-0.029878 (0.11208) [-0.26657]
D(LM2(-2))	-0.003102 (0.03084) [-0.10059]	-0.049401 (0.02401) [-2.05772]	-0.160631 (0.08882) [-1.80860]	-0.821023 (0.83454) [-0.98380]	0.027519 (0.07217) [0.38133]	0.163812 (0.11257) [1.45522]
D(LM2(-3))	0.044162 (0.02980) [1.48183]	-0.022116 (0.02320) [-0.95331]	-0.042185 (0.08582) [-0.49153]	-0.729697 (0.80643) [-0.90484]	-0.017660 (0.06974) [-0.25325]	0.021890 (0.10878) [0.20124]
D(LNTB(-1))	-0.000373 (0.00321) [-0.11622]	-0.001579 (0.00250) [-0.63139]	-0.006472 (0.00925) [-0.69961]	-0.506495 (0.08692) [-5.82728]	0.005454 (0.00752) [0.72564]	-0.016021 (0.01172) [-1.36648]

D(LNTB(-2))	0.003699 (0.00351) [1.05230]	-0.000794 (0.00274) [-0.29020]	-0.002344 (0.01012) [-0.23157]	-0.193394 (0.09511) [-2.03343]	0.014184 (0.00822) [1.72467]	-0.020486 (0.01283) [-1.59689]
D(LNTB(-3))	-0.012612 (0.00330) [-3.82150]	0.000219 (0.00257) [0.08541]	-0.001812 (0.00950) [-0.19061]	-0.044416 (0.08930) [-0.49735]	0.012026 (0.00772) [1.55724]	-0.006449 (0.01205) [-0.53540]
D(LUSP(-1))	0.052706 (0.03737) [1.41027]	-0.027205 (0.02909) [-0.93513]	-0.189057 (0.10763) [-1.75661]	0.015798 (1.01129) [0.01562]	0.140054 (0.08745) [1.60153]	0.189125 (0.13641) [1.38645]
D(LUSP(-2))	-0.019634 (0.03689) [-0.53222]	-0.087904 (0.02872) [-3.06104]	-0.095757 (0.10624) [-0.90135]	-0.463550 (0.99825) [-0.46436]	-0.127284 (0.08632) [-1.47452]	0.031215 (0.13465) [0.23182]
D(LUSP(-3))	0.077465 (0.03799) [2.03895]	-0.085563 (0.02957) [-2.89315]	-0.121070 (0.10941) [-1.10657]	1.482137 (1.02806) [1.44169]	0.141583 (0.08890) [1.59261]	0.059262 (0.13867) [0.42735]
D(LASI(-1))	-0.001642 (0.02348) [-0.06990]	-0.027151 (0.01828) [-1.48531]	0.054125 (0.06763) [0.80036]	0.163186 (0.63544) [0.25681]	0.105160 (0.05495) [1.91376]	0.123966 (0.08571) [1.44629]
D(LASI(-2))	-0.014985 (0.02351) [-0.63728]	0.017362 (0.01830) [0.94853]	0.123799 (0.06772) [1.82818]	-0.395029 (0.63629) [-0.62083]	0.018420 (0.05502) [0.33476]	0.096943 (0.08583) [1.12950]
D(LASI(-3))	-0.000394 (0.02380) [-0.01655]	-0.022813 (0.01853) [-1.23115]	0.005758 (0.06855) [0.08400]	0.393711 (0.64414) [0.61122]	-0.009546 (0.05570) [-0.17138]	0.130465 (0.08689) [1.50156]
C	0.010132 (0.00243) [4.17768]	0.005661 (0.00189) [2.99843]	0.026624 (0.00698) [3.81191]	0.088497 (0.06563) [1.34848]	-0.003173 (0.00568) [-0.55915]	0.004052 (0.00885) [0.45773]
R-squared	0.205616	0.296427	0.143324	0.259014	0.157472	0.192286
Adj. R-squared	0.095624	0.199009	0.024707	0.156416	0.040815	0.080449
Sum sq. resids	0.049901	0.030238	0.413838	36.53841	0.273226	0.664799
S.E. equation	0.019592	0.015251	0.056421	0.530155	0.045845	0.071511
F-statistic	1.869378	3.042835	1.208295	2.524549	1.349868	1.719341
Log likelihood	384.7022	422.0230	227.1020	-106.7060	258.0327	191.7883
Akaike AIC	-4.908754	-5.409704	-2.793316	1.687328	-3.208493	-2.319306
Schwarz SC	-4.525700	-5.026651	-2.410262	2.070382	-2.825439	-1.936252
Mean dependent	0.010087	0.003051	0.019219	-0.001524	-5.46E-05	0.009965
S.D. dependent	0.020602	0.017041	0.057132	0.577217	0.046810	0.074574
Determinant Residual Covariance	7.54E-16					
Log Likelihood (d.f. adjusted)	1325.627					
Akaike Information Criteria	-16.26345					
Schwarz Criteria	-13.96513					

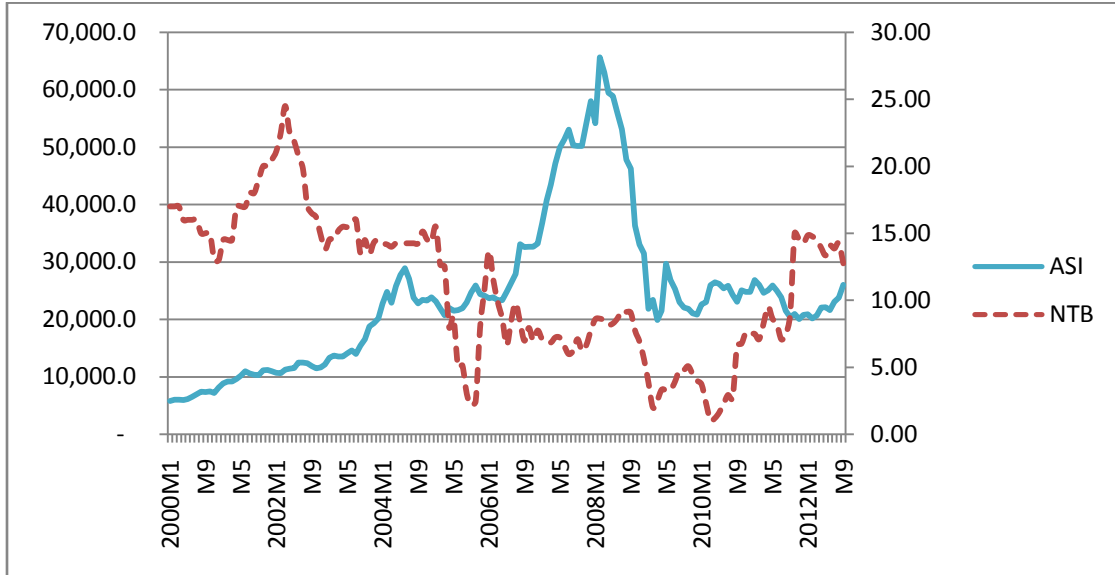
APPENDIX 6: Trend of ASI (2000-2012)



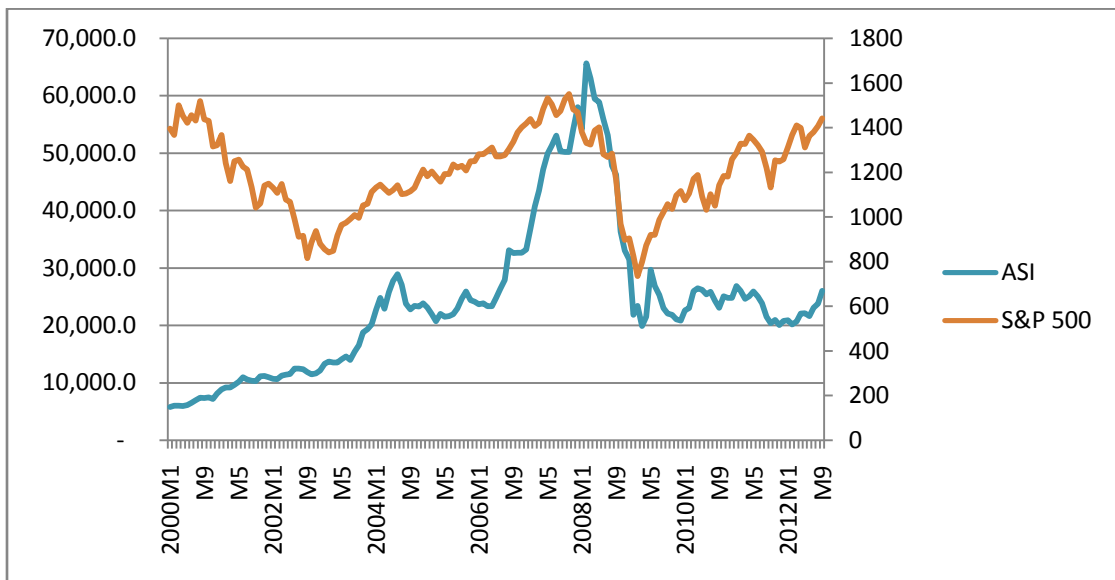
APPENDIX 7: Trend of ASI on inflation (2000-2012)



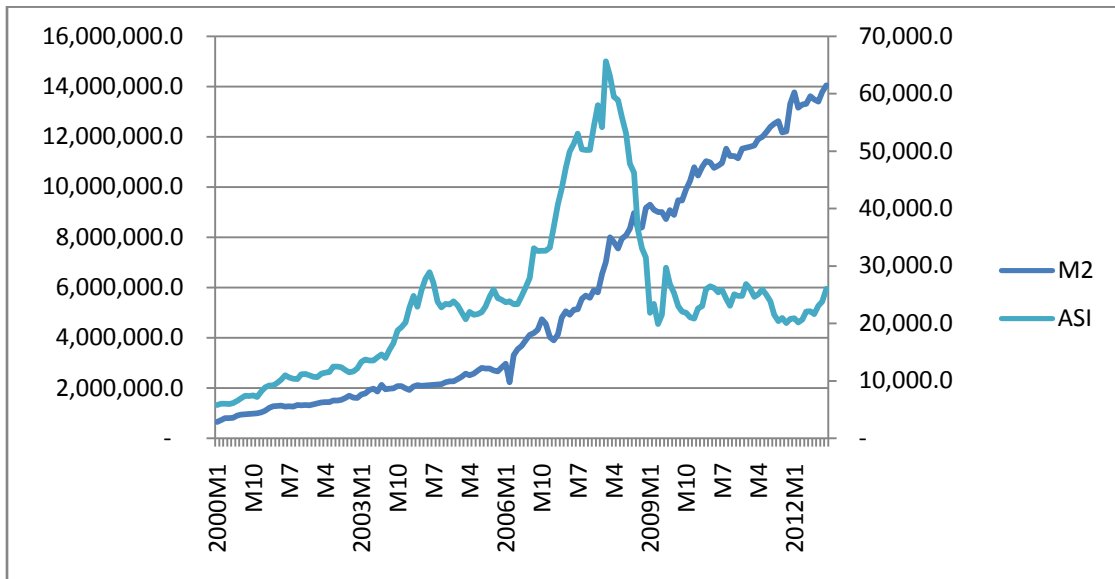
APPENDIX 8: Trend of ASI on NTB (2000-2012)



APPENDIX 9: Trend of ASI on S & P 500 index (2000-2012)



APPENDIX 10: Trend of ASI on M2 (2000-2012)



APPENDIX 11: Trend of ASI on NER (2000-2012)

