STOCK PRICE SYNCHRONIZATION AND MARKET VOLATILITY

BY

Eugene Oghenerukevwe OKAREDJE

MGS1606429

DEPARTMENT OF BANKING AND FINANCE

FACULTY OF MANAGEMENT SCIENCES

UNIVERSITY OF BENIN

BENIN CITY

JULY, 2021

STOCK PRICE SYNCHRONIZATION AND MARKET VOLATILITY

BY

Eugene Oghenerukevwe OKAREDJE

MGS1606429

A RESEARCH PROJECT WRITTEN AND SUBMITTED TO THE DEPARTMENT OF BANKING AND FINANCE, FACULTY OF MANAGEMENT SCIENCES, UNIVERSITY OF BENIN IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR DEGREE OF BACHELOR OF SCIENCE IN BANKING AND FINANCE OF THE UNIVERSITY OF BENIN, BENIN CITY

JUNE, 2021

DECLARATION

I declare that:

This project work is based on a study undertaken by me in the Department of Banking and Finance, University of Benin under the supervision of Dr. S. U. Eboigbe. This work has not been previously submitted for award of a degree elsewhere.

All ideas and views are product of my personal research effort and all references to works of others have been duly acknowledged.

_____

Eugene Oghenerukevwe OKAREDJE

Date:_____

CERTIFICATION

This is to certify that this research work has been submitted by **Eugene Oghenerukevwe OKAREDJE** with the Matriculation Number **MGS1606429** to the Department of Banking and Finance, Faculty of Management Sciences, University of Benin, Benin City under the full supervision of **Dr. S. U. Eboigbe** and in accordance with the requirement of the Department of Banking and Finance of the University of Benin, Benin City for the award of Bachelor of Science Degree in Banking and Finance.

Dr. S. U. Eboigbe	**Date**
Project Supervisor	
Dr. S. O. Igbinosa	**Date**
Project Co-ordinator	
Dr. M. G. Ajao	**Date**
Head of Department	

DEDICATION

This work is dedicated to God Almighty for his care, love, grace, support and endless guidance towards me and my mother, Mrs. Joy Okaredje for her relentless support.

ACKNOWLEDGEMENTS

First and foremost, praises and thanks to God Almighty, for His blessings throughout my research work to complete the project successfully.

My profound gratitude goes to my supervisor Dr. S. U. Eboigbe, for his patience, guidance, enthusiastic encouragement, valuable suggestions and also for the time he spent correcting this work despite his tight schedule to ensure the efficacy of this work.

Project writing is harder than I ever imagined but, the knowledge it impacts is undeniably rewarding, none of this would have been possible without the guidance of my supervisor, Dr. S. U. Eboigbe. I am and would forever be grateful to other esteem able individuals for their contributions towards the success of this project.

I am extremely grateful to my mother, Mrs. Joy Okaredje, for her love, prayers, care and sacrifices for educating and preparing me for my future. To Dr. Nduka Oyemike, Dr. Victoria Chukwu, Mrs P. C. Elike, and Mr. Stephen Elike words cannot express how grateful I am for the love and care you have showed me. To my siblings, Precious, Benedicta, Benedict and Marvelous you have been a great source of encouragement and support to my educational pursuits and I am grateful to God for bringing you people towards my path. And to my friends, Aghogho, Audrey, Happy, Praise-God, Joshua, Ifueko and Jennifer, thank you for your moral support.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The study investigated stock market synchronization and market volatility in Nigeria for a period of 11 years (2009 to 2019). The rationale for the present study is predicated on the fact that the stock market play a significant role in the economy of every country across the globe. The study employed the regression analysis techniques on variables such as all share index (ASI), treasury bill rate (TBR), broad money supply (M2), oil price (OP) and exchange rate (EXRT). The empirical results revealed that; treasury bill rate (TBR) has a negative insignificant effect on all share index in Nigeria within the period of investigation; broad money supply has a positive insignificant effect on all share index in Nigeria; Oil price (OP) exert significant and favourable impact on all share index in Nigeria; and exchange rate has a negative significant impact on all share index in Nigeria. The study recommends among others that; the Nigerian monetary authority should ensure exchange rate stability so as to encourage rate capital inflows in the economy; to ensure effective expansionary monetary policy in the economy, the Central Bank of Nigeria should strengthen the financial system so that broad money supply in circulation can contribute significantly to the performance of the capital market; and appropriate monetary measures should be undertaken to ensure stock price synchronization in order to the performance of the stock market in Nigeria.

CHAPTER ONE

1.1 INTRODUCTION

The term stock price refers to the current price that a share of stock is trading for on the market. Synchronization is the coordination of events to operate a system in unison.

Volatility is the statistical tendency of a market to rise or fall sharply within a certain period of time. It is measured by standard deviations – meaning how much a price deviates from what is expected, which is generally its mean. When volatility increases, we should see wide ranges in price, high volumes and more trading in one direction – for instance, few buy orders when the market is tanking, few sell orders when the market is ramping. At the same time, traders can be less willing to hold positions as they realise prices can change dramatically — turning winners into losers. Deeper analysis of market volatility suggests that there is a higher probability of a falling market when volatility is high, with lower volatility being more common in rising markets.

Efficient financial markets assists investor for the productive allocation of their funds through dissemination of relevant information. In emerging economies less economic information is processed by the stock markets. In such economies when prices change as a result of poor property rights, noise trading, and political unrest it will lead to poor asset allocation and reduction in economic growth. Meanwhile greater investor protection, good corporate governance and efficient enforcement system by the state, can transmit company specific information into the share prices and consequently, co-movement of share prices reduces

with the market. Morck, Yeung, & Yu, (2000) states that poor enforcement of property rights in the emerging economies decrease informed trading from the stock market, resulting in large market wide variation and high stock price synchronicity. Saving and investment benefits are influenced by the market volatility. A certain portion of market volatility cannot be controlled; excessive volatility not supported by the economic fundamentals, reduces the signaling function and obstructs resource allocation. High market volatility can be good or bad. Volatility caused by noise trading and political unrest weakens economy and it is bad.

Volatile market gives the indication of speculative trading as speculator gain from the volatile securities. Factors which are causing market volatility should be investigated. There are numerous factors that explain market volatility like crude oil (Bagchi, 2017), insider trading (Chiang, Chung, & Louis, 2017, Du & Wei, 2004), systematic risk (Chinzara, 2011), liquidity (Hameed, Kang, & Viswanathan, 2010), competition and premature trading (Deb, Koo, &Liu, 2014), expected stock returns (Guo, & Savickas, 2006), firm specific and herding by professional and amateur investors (Venezia, Nashikkar, & Shapira, 2011), corporate corruption (Lau, Demir, & Bilgin, 2013) and macroeconomics indicators (Pilinkus, 2010).

The main purpose of this study is to investigate stock price synchronization and market Volatility. This is an important issue in finance due to the important practical implications towards investment related decisions. Stock price synchronicity carries stock prices away from the fundamentals due to lower reflection of firm's earnings information in stock returns (An and Zhang, 2013). Stock price synchronicity results when share prices are moving up and

down together. Durnev, Morck, Yeung, & Zarowin, (2003), said high variation of firm specific return predicts healthier functioning of stock markets. It tells that company specific information regarding its fundamentals is capitalized in the stock prices. It signals an efficient stock market rather than a noisy market.

1.2 Statement of the Research Problem

Stock Price Synchronization and Market Volatility are two main issues that needs to be addressed. Some of the problems of this research includes whether the synchronization of stock price increases market Volatility in Nigeria, is caused by macroeconomic variables distortion.

Thus, this research investigates the impact of Stock Price Synchronization and Market Volatility in Nigeria market. More specifically this study seeks to provide answers to the following questions;

i. What is the relationship between Stock Price Synchronization and Market Volatility in Nigeria?

ii. How does Stock Price Synchronization affect Market Volatility?

1.3 Objectives

The main aim of this research study is to determine the impact of Stock Price Synchronization and Market Volatility in Nigeria. Specifically this research seeks to;

i. Determine the relationship between Stock Price Synchronization and Market Volatility

ii. Determine the effect of Stock Price Synchronization on Market Volatility

1.4 Research Hypothesis

There is no significant relationship between Stock Price Synchronization and Market Volatility in Nigeria industries.

There is no significant effect of Stock Price Synchronization on Market Volatility in Nigeria industries.

1.5 Scope of Study

This study focuses on the empirical relationship that exist between stock price synchronization and market volatility in Nigeria within the period of 2001 to 2019.

This is justified based on the stock capital meltdown where the market capitalization nose-dived from an all time high of #3.5 trillion in march 2008 to less than #4.6 trillion by the second week of January 2009. Also, credit crunch in the economy as banks do not have enough to lend to the productive sector leading to high interest rate.

1.6 Significance and Relevance of the Study

Empirical and theoretical studies have been carried out in the past by several researchers on the impact of Stock Price Synchronization on Market Volatility. This study is significant thereby bridging the existing gap in the literature as it relates to Nigeria market. Equally important, the outcome of the study will be of benefit to managers in organization on what strategy to employ regarding Stock Price discovery and Market Volatility.

The methodological relevance used for the purpose of analysis to fill the gap in the research include; the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) Test and

Granger casuality Test is used to ascertained the long run relationship among variables. The vector Error Correction Mechanism (VECM) under the framework of Vector Autoregressive (VAR) model is used to test the short run relationship.

This research guides the regulators to emphasis companies for transparent disclosure of firm-specific information because information disclosure fosters trading in the market and reduces stock price synchronization. It results in efficient working of stock market. The study also guide, the economic managers to take steps to manage macroeconomic variables that have the potential to affect market volatility. This study also guide the investor regarding rational security analysis and incorporating those factors while making investment strategy which can influence stock price synchronicity and market volatility i-e encouraging informed trading. This study attempts to investigate the impact of Stock Price Synchronization and Market Volatility in Nigeria.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The researcher in this section reviews relevant literatures concerning Stock Price Synchronization and Market Volatility in Nigeria. Specifically, relevant concepts, theoretical framework as well as empirical literature related to this study are examined.

2.1 Conceptual Review

In this study, related concepts are reviewed in order to give more understanding to the research topic.

2.1.1 Concept of Stock Market Volatility

Stock market volatility is a measure for variation of price of a financial asset over time. It is essentially, concerned with the dispersion and not the direction of price changes. Issues of volatility in stock market behaviour are of importance as they shed light on the data generating process of the returns (Hongyu & Zhichao, 2006). As a result, such issues guide investors in their decision making process because not only are the investors interested in returns, but also in the uncertainty of such returns. Efforts toward financial sector reforms would be an exercise in futility if volatility of stock market is not addressed. A volatile stock market weakens consumer confidence and drives down consumer spending (Porteba, 2000). It affects business investment because it conveys a rise in risk of equity investment (Arestis, Demetriades, & Luiniel, 2001; Mala and Reddy, 2007). This can alter investment equilibrium position of an economy as investors turn to purchase stocks of larger well known firms at the

expense of new firms. It can trigger a general rise in cost of capital and directly affect economic growth. Investors' portfolio allocation would be affected as they would have to hold more stocks in their portfolios in order to reap the benefits of diversification (Frimpong & Oteng-Abayie, 2006).

2.1.2 Stock Market

Stock market is a market for trading instruments of securities like stocks, which show ownership of shares in the exact organizations that is issuing the securities. These securities are more often than not offered by large companies that the returns in the form of dividends are promised, which depends exclusively on how the issuing company performed overtime. Additionally, investors would also benefit from the increase in the prices of stock. The stocks are frequently listed as well as traded on stock exchanges organizations and they make available exchange services for brokers as well as traders. Stock exchange presents trading services for the issue as well as the redemption of securities. Stock exchange also offers other monetary instruments and capital proceedings which include the disbursement dividends. Occasionally, they are referred to as the exchange of securities to replicate the extensive role they play.

Furthermore, bond market involves long-term debt securities such as treasury notes, bonds, and mortgage securities amongst others. A good number of the instruments agree to pay either a particular or fixed stream of revenue that is resolute based on an explicit method

over its whole life as well as return face value on maturity. Most people that issue bonds are the government and organizations.

Stock markets, as part of the capital markets, are vital establishment in lasting financial intermediation. For some reasons, stock markets that are well developed are vital for upholding the effectiveness of funds. Firstly, well performing stock markets breed lesser cost of capital that is equity in nature for companies. Secondly, incessant fine-tuning prices of share in a well performing stock market impose mechanism on the investment performance of companies. Thirdly, investors are opportune to price and hedge against risk efficiently in a well-performing stock market. Lastly, stock market works as an apparatus for catching the attention of foreign portfolio investment, in so doing, growing the existing resources for investment purposes (Demirguc-Kunt & Levine, 1993). The authors hypothesized and assert the idea that finance is imperative for growth. Some theorists see stock market as a meter of the health of the financial structure within an economy since it shows the frame of mind of investors in a given country (Tachiwou, 2010).

Inanga & Emenuga (1997) sees stock market as a multifaceted organization instilled with innate device all the way where long term capitals of the key segment of a nation encompassing persons, companies, and governments are assembled, joined and prepared to diverse economic sectors. Capital market and stock market development grant opportunity for better mobilization of capitals, enhanced effectiveness in dissemination of resources and stipulation of appropriate information for evaluation (Nyong, 1997).

2.1.3 Monetary Policy

The phrase monetary policy from the CBN discharge on monetary policy concept (2006) is seen as any guiding principle premeditated by the Federal Government through the CBN to manage availability of cost and credit supply. It can also be known as the parameter of monetary supply as well as interest rate by the CBN in a way to regulate inflation and to steady the flow of currency in any given economy.

Conversely, in the CBN Series No. 97/03 June 1997, Monetary policy was further described as the blend of actions premeditated to control the worth, supply rate of money within a financial system in line with the projected point of activities within the economy.
It means that the surplus supply of money would lead to more requests for goods and services that may result to increase in prices and determination of balance of payment position. Monetary policy is one of the existing instruments of macroeconomic objectives. The principal goals of macroeconomic policy are price stability, external stability and a suitable growth rate.

2.1.4 The Structure of Nigerian Stock Market

Recent studies are of the view that the liquidity of stock market is a channel for long-term growth obtainable in advancing economies (Jibril, Sherifsharaby, & wilby, 2015; Afolabi, 2015). A stock market, devoid of liquidity will hinder a lot of lucrative investments that requires long-term funding from being carried out because most investors would be reluctant and indisposed to commit their funds for longer time periods. Contrary, liquid

equity markets enable investors to get rid of their shares when the need arises in so doing allowing organizations to increase capital on suitable terms that is equity in nature. By enhancing longer term, additional, cost-effective investment projects, liquid markets improve the distribution of capital and augments projection to grow the economy for long-term period. Capital market is a well-structured market that offers services to increase long-term loans in order to fund, expand and modernize industries. It is also set up to offer a stage where capital suppliers can speedily and simply refurbish their liquidities. Capital market aids the drive of mobilizing capital as well as allocating the financial resources of the country within numerous battling customers for different uses. The important roles executed by the capital markets are catalysts for rapid economic development and growth. This was the purpose and reason for setting up the NSE in March in the year 1960 as Stock Exchange of Lagos.

Stock exchange in Nigeria controls the market responsible for the purchases and sales of stocks, Government bonds and debentures and they are all referred to as securities. Akin to otherworld stock exchanges, are two major markets within the NSE. This includes the primary as well as the secondary markets. The primary market is also referred to as the new issue market, where initial capitals are raised. The Government and entrepreneurs were capable enough to get loans long enough to fund developmental plans and growth of industries amongst others via the primary markets. This segment of the market under the NSE has huge effect on the Nation's economy. This tells that Nigeria's nascent industrialists and

entrepreneurs may perhaps have no well structured market where they might get loans for long term investment plans.

Consequently, the mobilization of funds for long term productive uses in the economy might have been very hard excluding NSE market. Secondary markets under NSE are saddled with the responsibilities of the purchases as well as the sales of existing instruments. NSE via the market segment makes available the opportunity of refurbishing liquidity to the investors as well as permitting the spreading of risks in an effective and efficient manner. Where, those who access such funds like the Government and entrepreneurs keep hold of the financial resources in their investment projects. Exchange actions via these means make available the task of gathering together savings from the those who are willing and are able to save and allocating them to those who are in need of such funds. For this reason, larger percentage of the financial resources goes to those investment projects that have the highest returns given a certain level of risks. This distribution role of the Nigerian Stock Exchange is important in shaping growth generally as well as good organization of the economy of Nigeria. If funds available are not readily made to the economic units with high demand, proficient in productivity at the suitable point in time period, the growth pace of the economy and development would certainly slow (Alile, 1996). The NSE accordingly turn out to be the trademark of the capital market of Nigeria, thus NSE are often used in place of capital market.

2.1.5 The Nigerian Stock Exchange Growth

NSE has experienced remarkable growth from inception in the year 1960. The evidence of the growth is seen in the rising amount of traded securities of the capital market, market functionaries as well as capitalization of equity and the size on the floor of the stock exchange. Certainly, many reasons are accountable for these growths amongst them are;

a) The possession of the base credit. This was accountable for the large inputs in the third and subsequent growth in stock loan offering in 1962 and 1961.

b) The 1961 administration of tax on income. On this note, not less than one-third of all funds, pensions and future earnings in the country were placed for investment in the government of Nigeria's stocks or face the consequence of forfeiture of valued tax concession.

c) National Provident Funds of 1961. This states that, all incomes and Pension funds that are set up later in 1961 that were needed on the Act to input at minimum half of these money in stock.

d) The1964 Insurance Act. This stipulates that, the insurance firms functioning in Nigeria are to invest not less than 40% of their earnings on domestic hedged risks in a particular fiscal year period. And also, not less than 25% of all the domestic investments of these firms ought to be in the securities belonging to government.

e) CBN functioning has largely propelled growth and improvement of stock market in Nigeria by means of its securities. The CBN avails services and offers the apparatus of marketing these securities.

f) The1951 lead firms' ordinance as amended, specifies that only those inte usernational firm which enable not less than 10 percent of their paid up capitals are to be held by indigenes will gain from free tax breaks as well as other special consideration as may be required. This certainly motivated firms to offer fraction of their equity capital to Nigerians.

h) Privatization of essential Government dominated functionaries and other ventures have to a great extent motivated more transactions in industrial stocks in the Exchange.

i) Furthermore, the BOI impacted greatly on the immense growth of the exchange by motivating potential firms to integrate into limited liability companies and subsequently propose to adopt their shares after integration, and lastly advising such firms to submit an application for quotation of stock in the exchange at the right point in time.

2.1.6 The Performance of Nigerian Stock Market

Capitalization of equity of the exchange has persistently and progressively risen overtime. It rose from the sum of N5.5 billion within the year 1981 to the value of N9.2 billion in the year 1987 and during this period of growth, Government securities piloted this growth with the sum of N3.9 billion in comparison to N1.9 billion as well as N4.2 billion in comparison to N4 billion in 1981 as well as 1987 in that order. Afterward the sum of equity capitalization not merely demonstrated notable progress; however, in 1995, equity capital blazed the trail by way of having equity capitalization of N177.1 billion against stocks belonging to government which was N3.7 billion. Total market capitalization rose to

N13,781.7 billion in 2007; this elevation was attained due to the individualization of certain enterprise by the federal authority (CBN, 2015).

Nevertheless by 2008 the impacts of the world-wide economic meltdown which commenced in the year 2007 had already started to affect the capital market adversely. And this is evident as foreign investors started to pull out their investment may be to measure up with the expectations from their domiciliary nations. And as a result of this, by 2009 the universal growth rate went down by 80 percent. Even though, that by the fourth quarter in 2009 the market adjustment had began to fall in place, but, the shattered self-reliance in the market is since being in restoration and yet to fully pick up. Since then, market capitalization had constantly to fluctuated downward from -29.8 percent, -23.6 percent, 47 percent as well as 4 percent in 2008, 2009, 2010 and 2011 correspondingly, at the same time as yearly rates of proceeds fluctuated from 19.3 percent, -91.4 percent, 18.7 percent as well as -21.9 percent in 2008, 2009, 2010 and 2011 in that order. Moreover, the amount of listed securities fluctuated as well from 2008 to 2011 as -2.9 percent, -17 percent, - 0.9 percent as well as -5.8 percent respectively in that order (Okonkwo, Kooner, & Waardt, 2014).

2.1.7 Stock Market Contributions to Capital Formation in Nigeria

Stock market principally survives as a medium for financial resources enlistment. Nevertheless, funds mobilization is limited to the transferring of capitals into new issues; hence, lead to an upsurge in capital creation. The federal authority has mobilized long-standing credits for loaning to the county as well as state governments for crucial

infrastructures via the stock market ever since the inception of NSE. The federal government advised the state governments to explore the stock market in mobilizing long-term funds for developmental infrastructures. Thus, the state governments can be subjected to market regulation. Presently a good number of states have mobilized long term capital via the stock market for huge projects geared towards development. What's more, the liberalization of foreign exchange market, interest rate structure deregulation as well as policy of dividend made stock market in Nigeria a key alternative in the formation of capital. Additional firms now utilize the stock market services for upholding her balance sheets and hence growth. This process, has also led to the flood of debenture stocks, rights issues, as well as offers for subscription.

Due recognition has been given by the NSE on the need of turning small as well as medium scale corporations into large enterprises by introducing in 1985 the Second Tier Securities Market for the encouragement of small as well as medium scale businesses in the nation. And this is being achieved by offering services at the market to enable potential small as well as medium scale home-grown businesspersons to get the needed capital for growth and transformation of their industry at lesser stern requirements associated with listing. The second tier securities market also influenced enormously the process of capital formation of the country and afterward, reducing unemployment (Okonkwo, *et al.*, 2014).

2.1.8 Capital market contribution to socio-economic development of Nigeria

Capital market is exceptionally essential to the growing economy, development as well as the potency of a nation because the market promotes corporate, government ideas, finances ideas as well as enhances the spread of risk inherent in the financial resources. The growth of economy pace is associated with the complexity of the capital and financial markets organizations at large. Both markets make possible the recruitment and distribution of capital into industrious use and making sure that the capital mobilized are utilized for achieving socioeconomic growth and development devoid of being dormant (Akinbohungbe, 1996).The Nigerian capital market has grown immensely overtime, typically all through the indigenization periods of 1972 and 1977. The securities rose from 8 in 1961 to about 301 in 2008. Overtime, the market has experienced steady and also recorded astonishing growth as well. This has placed the market to have significant effect on the nation. An apparent indication that the financial market continued to be a vital means of fund for the country's development in the areas of financing infrastructural facilities as well as the privatization program of the government in Nigeria. In this regard, Sule & Momoh (2009) are of the view that the current endeavor by the government in carrying out a successful consolidation program exercise of the main financial organizations in one hand and privatization program exercise of publicly owned corporations in the other hand attests government's confidence in the capital market as a tool to galvanize growth of the economy in Nigeria.

Capital market is a feasible source of funding state as well as local government infrastructural investments and developmental advances with a lesser amount of pressure. The initial state that sourced money from the market was the State, the then Bendel state which was offered 20 million naira for a period of ten years and that constitutes 7% stock loan of the then Bendel in the year 1978 and the loan expiration date was 1988 (Oke & Mokuolu, 2004).The purpose of the loan offering was to fund a project on housing. Another state that raised money from the market is Ogun state in the year 1986 to fund a construction geared towards access portable water in Abeokuta for the state. They were issued a twelve percent loan stock of fifteen million naira which was to be due in the year 1996. Lagos State also explored the market in the year 1987 and 1988 respectively. They were able to raise a total of ninety million naira which was thirty million for the first tranche and sixty million naira for the second tranche and both was for the 1st and 2nd phase of project in Lekki Peninsula. Oyo State also sourced sixteen percent thirty billion naira Bond in the year 1999 in order to develop Adamasingba Complex as well as Gbagi market.

Furthermore, the government of Kaduna State sourced thirty million naira twice in the year 1989 to 1993 each to fund the construction of the state factory for processing Ginger. Local government in Lagos State benefited also from the market to fund a shopping mall. It was a hundred million naira bond with about twenty five percent rate of interest. (SEC, 2002). In addition, Edo State accessed the market as well in raising the first Edo State 21% five hundred million naira Floating Rate Revenue Bond in the year 2002 &2006. The purpose was

to fund the reformation of the stadium and other vital projects. Overtime, many other States have accessed the capital market to fund projects geared towards development. such as, Ekiti State who raised four billion naira in the year 2002 to fund the rehabilitation and construction of roads, expansion of water project, rural electricity and establishing plantation among others. Yobe State also sourced 2.6 billion in the year 2001 for road construction, good drainage system and housing development. Moreover, Akwa Ibom State sourced six billion naira for infrastructural development, Also, Delta State were able to access market to raise five billion naira for socio. economic development of the state. Cross River State were able to access the sum of N4 billion for expansion and improvement of Obudu cattle Ranch. Edo State also sourced one billion naira for the financing of Estate development. Oluitan and Anne (2013) while lamenting on the low degree at which federating units accessed the market for funds, the capital market was also seen as an authentic source of funding for the cash-strapped universities yet to be harnessed.

The Capital Market performed an imperative task in the privatization of Enterprises Owned by the State by making sure that the exercise was credible and transparent. Enterprises Owned by the State were sold out and the earnings were realized. Also, the shares of the Enterprises Owned by the State were offered to the public and all interest parties via public offers.

The N25 billion recapitalization of banks in which 24 banks (but formally 25 banks before the merger of Stanbic and IBTC bank and FCMB and Finbank) materialized from the

initial eighty nine banks evidently showed the significance of the capital market, virtually all the banks in the country were capable of raising the needed fund after accessing the capital market via first public offerings. In 2005, $650 million fund amount was invested in the sector of banking. The amount realized from the markets by deposit money banks to achieve the least capital requirement of ₦25billion stood at ₦406.4 billion (Al-Faki, 2006).

2.1.9 Performance Measures of the Stock Market

The performance measure of the stock market can be classified into three major segments: traditional segment, institutional segment as well as asset valuing segment (Demirguc-Kunt & Levine, 1996). Old-fashioned features dealed with the vital measures of assessing the stock market growth. These consist of market capitalization, listed number of securities and number of quoted companies. While the institutional features entails the variables that reflect the position of regulatory and supervisory institutions in the system such as the disclosure of information, transparency requirements, market barriers, trading costs. Finally, the asset valuing feature of the market entails the effectiveness of the market as regards to the pricing of risk.

Traditional distinctiveness:

The traditional stock market features are mainly applied in measuring the relationship existing between stock market performance and the growth of the economy. These consist of stock market size, liquidity and concentration.

(i) Stock market size: A universal index used to appraise the size of the stock market is the market capitalization. This is the sum total of the listed shares. This performance measure is often used for assessing the size of the market, as it applies to the relative influence of the stock market on the economy as a whole. The supposition is that the proportion of market capitalization is certainly linked with the mobility of capital and the possibility of diversification of risk. When calculating the variable of capitalization of market, the stock market capitalization is used to size the economy to land at a size weighted variable that more precisely assess and hence, an enhanced surrogate for the relative level of the performance of stock market. To determine the impact of market size on growth, the ratio of capitalization is employed which is the sum listed shares divided by Gross Domestic Product, which is taken as an indicator of market size for the performance of stock market. This ratio weighs the stock market size capacity to rally funds and facilitate risk diversification. An additional appraisal of the market size is the total companies listed and their expansion rates.

(ii) Liquidity: Liquidity is the investors' capacity to purchase and put up for sale securities without difficulty. Levine (1997) opines that liquidity is the easy and quick way in market operators can alter their assets into cash at settled prices. Previous works have not been able to show the tiny difference that exists amongst stock market liquidity and turnover ratio. For example, Al-Faki (2006) is of the view that the liquidity of stock market also symbolizes the market turnover ratio. He put forward that turnover, or by and large

liquidity can fit in as outlook index; as a result representing an indicator of the mind of investor'. Is a vital pointer of the stock market performance for the reason that it shows how the market assists in enhancing capital allocation and consequently promoting the projections of long-run growth. However, this is achievable via the capability of the fund users to speedily and reasonably purchase and sale their securities thereby minimizing the risk level of their investment and enhancing investments in viable project that will yield more output despite the fact that it will take a long period of time (Osinubi, 2002).

a) **The proportion of market capitalization:** To obtain this, the worth of quoted firms' capitalization is divided by gross domestic product. It offers an assessment of the stock market dimension comparative to the economy size. It is an adequate assessment of the comparative of the stock market extent in the nation.Market capitalization is arrived at by multiplying the share price by the shares outstanding number. This measures the size of capital market and is applied to ascertain developmental level of the capital market relative to the economic growth of the nation.

b) Value traded ratio: This shows the total worth of traded shares overtime. Total traded share value that is divided by gross domestic product shows the level of market liquidity. Market liquidity is simply how quick the securities in the market are traded. This indicator complements the capitalization ratio of the stock market and shows whether the market size is relative to its trading activities. The total value of securities traded proportion is the whole worth of offer marketed in the stock market divided by Gross Domestic Product. It is a

liquidity based assessment which provides the value of organized marketing of company as national output share. This indicator is normally applied side by side as the proportion of market capitalization as in growing market because; the extent of the market can be comparatively big but marketing activities still at very small extent. Stocks traded refer to the whole worth of share marketed at a given time.

c) The proportion of Turnover: This entails the overall worth of traded shares over a particular period of time divided by the mean equity capitalization within that period. The turnover ratio is an additional measure of liquidity that is equals to the total worth of shares divided by equity capitalization of the market. Quite the opposite to the total traded shares value divided by gross domestic product ratio, which shows the worth of traded shares compared to the economy size. This pointer evaluates trading comparative to the stock market size. As a result, it aids the identification of little but very functional stock market with potentials of growth. By applying both liquidity and alongside market capitalization ratio of assessment and a clear picture of the level of how well the stock market has performed overtime can be obtained.

Demirguc-Kunt & Levine (1996) recognize two major rationales for the imperative of liquidity in the categorization of the performance of stock market. Liquidity shows the level of investment risk. Investment project is considered less-risky where an investor can speedily and in expensively alter their portfolios. Secondly, supposedly, allotment of funds is more resourceful seen that liquid market propels long run growth. In addition to the

aforementioned, Osinubi (2002) stated that market liquidity enhances lucrative dealings between the stock market and the money market. Shares are without doubt good enough as collateral for bank loans in so doing, improves investment of credit. According to Levine & Zervos (1996), liquidity of stock market is a vigorous indicator of real per capita growth merely after taking into consideration primary education investment, openness to trade, fiscal policy, political stability as well as the stability of macroeconomic indicators.

(d) All Share Index: The index of a market is a rapid technique of assessment to derive the general trend of the market and the extent of its progress. The index of a market is a algebraic factor to replicate the market features value complexity. It is the weighted value of the cost of all firms' shares on the exchange, regularly used as a lead to evaluate the performance of various corporations and industries. It is also a sequence of figures which illustrates the varying standard value of all companies share prices on the stock exchange, which is adopted as an assessment measure to know the extent of the performance of the market overtime.

(iii) Market Concentration: This feature assesses the intensity of dominance of the market by a small number of companies. Market concentration refers to the share capitalization accounted for by the dominant enterprises most especially the international business firms than the indigenous firms, for instance, fraction of selected biggest stock to total capitalization in the market. The importance of concentration as an assessment indicator of the performance of the stock market and the likely extreme consequence on market liquidity cannot be overemphasized. The market capitalization share accounted for by the most traded

stocks frequently indicates the level of concentration of the market. If the market is controlled by a small number of companies, they can influence the process of price formation. Consequently, a high proportion of market concentration is not sought-after. Nations with high markets concentration have undersized markets. Consequently, market concentration is theorized a negative relationship with market size and liquidity. Numerous academicians in the field of economics and finance in Nigeria put forward that the Nigerian stocks market is dominated by a few companies (Inanga & Emenuga, 1997; Osinubi, 2002). By this, a huge value signifies less development of stock market. The extent of market concentration is imperative to give one an idea about the actual working wellness of the market. A market with high concentration level is an evidence of intense and market illiquidity. In such situation, there are minimal profits of spreading of risk in the markets.

Institutional distinctiveness:

(i) Regulatory Institutions: The regulation of institutions is an approach of propping up the faith of investors in stockbrokers and any other mediators and stakeholders in the capital market. It enables transparency and market operation's fair play. As a result, boost investment and stock market trading. Nigeria stock market had from the start guaranteed that a well-built institutional structure was prepared via the creation of Capital Issue Commission although, it has no backings legally. And soon after, it converted to Nigeria Securities and Exchange Commission (1979) Another point to note according to Inanga & Emenuga (1997) is the self-regulatory institution function attributable to Nigerian Stock Exchange.

(ii) Price of transaction: A comparative indicator of stock market efficiency is cost intensity incurred in stocks transactions. The higher the cost of transaction is perceived to be, the more inefficient the market is. Transaction can be seen either in the viewpoint of the companies or the investors. Companies' viewpoint entails total expenses experienced in the tender to loan stock offer or equity to the public. Alternatively, from the investor's end transaction cost includes total expenses experienced in the sales and purchases of shares securities or loan stocks. The prominent costs incurred in the capital market of Nigeria comprises of: application fee (0.5%), valuation fee of 0.75%; brokerage fee of 1%; and vending fee of 1%. Others cover the payment made to solicitors, auditors, administrative costs as well as expenses incurred for advertising according to Inanga & Emenuga (1997).

(iii) Market Barriers and Trade openness: prior to the promulgation of the indigenization decree of 1972, foreign investors were not restricted in the capital market of Nigeria. Nigeria Investment Promotion Decree was later modified in the year 1977. Amongst other stern actions taken, it successfully restricted the influx of capital to a full value of 40%. That is, equity held in securities listed. The Decree was once more modified in the year 1989, period of privatization. Nevertheless, complete market deregulation was achieved by the Nigerian Investment Promotion Commission Act of 1995, Foreign Exchange Miscellaneous Provisions Act of 1995 as well as the Investment and Securities Act of 1999. Hence, foreign investors participated in the Nigerian capital market's activities both as market participants and

investors. As at 2001, there was no limit to the foreign companies holding's percentage in any registered firm in Nigeria (BGL Financial Monitor, 2001).

Open economy captures the extent to which opening of an economy could influence the performance of the stock market and the growth of the economy. Theoretically, Trade openness has frequently been referred to as enhancer for growth, due to the fact that it allows countries to use its comparative advantage and benefit from international trade. Though, empirically the results vary. The openness of trade is measured by the total of imports and exports of goods and services over gross domestic product. Some control variables as exchange rate and foreign investment were also included.

Because Trade Flows and FDI can be linked, the FDI was equally included in the measure of trade openness. FDI is a vital foundation of stock market performance. Foreign direct investment also plays the role of mobilizing household savings within the nation via job formation and facilitation of technology transfer (Singh, 1997). In the absence of FDI, it would have been almost impossible the raise the huge sum of the needed capital from the nation's domestic savings. The effect of the long run influx of foreign capital into the economy is extensive than the gains from the earlier inflows. International investment is connected with regulatory and institutional restructuring, listing requirements satisfactory disclosure as well as practices relating to fair trading. The raise in operational and informational efficiency has been projected to arouse better assurance in the markets domestically. This boosts the investor's trust, confidence and participation, hence, pilots

additional floods of capital into the stock market. Flows of Capital are determined using international investment as a percent of GDP.

Asset Pricing Features: This entails the efficiency and effectiveness of risk pricing in the market. The key benchmark for assessing efficiency and effectiveness of market prices encompasses the informational content characteristic of the prices. The price of the market is deemed efficient when; it sufficiently and rightfully shows all information that is available from the past, the present and the future information, which can be accessible to all market participants concurrently. It is referred to as semi-strong. According to Inanga & Emenuga (1997), when the existing prices of the stock mirror the information enclosed in the past prices and when all public information are available with slight predictive worth, the market is considered as weak.

2.1.10 Financial Deepening and Measurement

This appraises the impact of the monetary policy's instruments on the financial sector. The strength of financial sector, as determined by money supply (M_2) ratio to GDP as well as the credit to private sector ratio (CPS) divided by GDP, is regarded as the financial sector deepening. It shows the ability of the banking system to make available liquidity for the trade of goods and services (CBN, 2015).

Growth is measured as GDP over time. GDP is obtained by the summation of the market price worth of all produced goods and services at a particular time as well as the total worth of all firms in any given economy. It has been revealed that the performance of stock

market ought to be connected positively to the intensity of real economic activities as determined by GDP. What's more, the performance level of the market is long- established by the proportion of capitalization of market to gross domestic product. This will furthermore, reveal the capacity of economic activities as well as growth of any given economy. GDP is applied in this study as growth rate.

2.2 Theoretical Framework

Two important theories explain this study. These are financial liberalization theory and market based asset allocation theory. They are discussed below:

2.2.1 Theory of Financial Liberalization

This theory originated from the work of Patrick (1966). The theory focused on the association existing between financial growth and development of the economy. This theory proposed two theoretical approaches namely; demand-following and supply - leading approaches. The demand - following technique proposes that as economies begin to develop, development of financial institutions takes place, whereas supply-leading technique states that the prevalent increase of financial institutions pilots growth of an economy (Arestis, 2005). Shaw (1973) and McKinnon (1973) supports this theory when they stated that financial deregulations can wield an encouraging influence on the rate of growth as interest rate levels rise in the direction of their competitive market equilibrium, at the same time as resources are proficiently allocated. In the view of Arestis (2005), the correlation existing amid the development of financial sector and the growth of the economy has gained

prominence all through the contemporary history of economics. Moreover, there is an armful of empirical works that made available sufficient proof signifying a positively connected relationship between financial market and growth of the economy. However, the discourse is now about spotting out the means via which financial markets are allied to the real economy. Pagano (1993, as cited in Bekaert, 1995), pointed out that there are three major ways through which financial institution and economic growth are associated simultaneously. The number one means he pointed was that a well performed financial market enhances savings proportion that is channeled to investments. The next one was that financial market transforms the saving rate, which in turn influences Investment and the last point noted was that capital allocation efficiency is augmented by the financial market. a good number of the literatures on hand argues that the most imperative of all is the second and last channel, by which the financial market intermingles with the real economy, i.e. by the efficiency in capital allocation (Beakaert and Harvey, 1997).

The relevance of the theory to this work is that stock market is a financial institution in Nigeria, which its expansion in investment portfolios and development could contribute to the growth of the economy.

2.2.2 Market Based Asset Allocation Theory

Market Based Asset Allocation Theory was put forward by Markowitz (1952; 1959). This theory explains the need for the allocation of investment portfolio efficiently given a certain level of risk and return. The theory is on selection of portfolios, which led to the uprising of finance theory and brought about the basis for theory of capital market in modern time. Contemporary theory on portfolio elucidates asset portfolio's construction and selection based on a certain level of risk, the projected investments return and risk choices of folks. The inference of the normative approach of the Markowitz model stipulates that portfolios is based on predictable risk and return as well as the covariance of return among each asset's pair are planned by finance experts. The portfolios are chosen from those hanging on a proficient frontier which depicts the tradeoff flanked by risk as well as return. The frontier is proficient for the reason that the end result of the selected choice has the maximum predictable return for same risk level. The theory is associated to the work due to the fact that investment portfolio diversification encompasses taking of risk. Steinbach (2001) in his work postulated that selection of portfolio entails the supposition of the investor concerning his expectations and is thus denoted by the likelihood of asset returns distributions. These likelihood distributions are hence dependent on the judgment of market analyst as well as statistical projection from chronological information. The dimension of the anticipated return on portfolio is dependent on the aggregate of the experiential returns on asset. Risks are

measured as the portfolio variance that is derivable from the asset returns covariance (Santos & Haines, 2004).

2.3 Empirical Review of Literature

The stock market is an ever-growing important feature of the economy. One of the most enticing and long lasting debates in economics revolves around whether or not there is a link between stock market volatility and economic growth. Many researches focus on the relationship between stock market volatility and macroeconomic performance (real output, inflation, investment). The recent empirical investigations provide mixed results.

On one hand is the view that stock market volatility is significantly and positively correlated to economic growth (see Ahmed & Samad, (2008); Levine & Zervos, 1998), while on the other hand, there is still doubt on its contribution to long-run-economic-growth. Indeed, some analysts even claim that stock market volatility has an adverse effect on the economy (Adjasi & Biekpe, 2006). Most studies however tend to focus mainly on the developed countries (Ahmed 2005; Levine & Zervos, 1998) while existing literature in African regions is scarce (Osinubi, & Amaghionyeodiwe, 2003; Rahman & Rahman, 2007; Chinzara, 2011).

Though the importance of stock market volatility on economic growth has received much attention, a highly inadequate number of research works have been done to investigate whether or not there is a relationship between stock market volatility and economic growth in the case of Nigeria economies. Campbell et al. (2001) suggests that stock market volatility has significant predictive power for real GDP growth. However, Guo (2002) shows that the

relationship between stock market volatility and economic activity is not fully robust to deserve model specifications. In regressing GDP growth on contemporaneous stock market volatility, Guo finds a significant and negative effect on GDP growth. However, once controlled for the current stock market return or for the current and past return jointly, the effect of instability tends to weaken or becomes insignificant. Hence, the conclusion from his work is that stock market returns drive out stock market volatility in forecasting output and, therefore, beyond stock market returns the volatility of the stock market provides no additional information about future output.

Raju and Ghosh (2004) in attempting to calculate the volatility of stock prices for a number of countries came into conclusion that both in Indian and Chinese stock market volatility is higher compared to other emerging economies. Döpke. (2005) using monthly data of Germany concluded that volatility in the stock market can be explained by the performance of major macroeconomic indicators which have influence on business cycles. Wang (2010) investigates the time-series relationship between stock market volatility and macroeconomic variable volatility for China using Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) and Lag-Augmented VAR (LA-VAR) models and found evidence that there is a bilateral relationship between inflation and stock prices. In addition, a unidirectional relationship exists between the interest rate and stock prices, (from stock prices to the interest rate). However, a significant relationship between stock prices and real GDP was absent. Our study however is an archetype of this study but the structure of

Nigerian economy is quite different from China. China today is known to be an emerging country in the world whereas Nigeria is still a developing nation.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter defines the research methodology adopted for the entire project. It shows how the research is being carried out. It covers the research design, population, sampling techniques, sample size, source of data, method of data analysis, model specification and the operationalization of variables.

3.2 Research Design

A research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. This study adopts a cross-sectional research design and panel data approach because the data were collected at a particular point in time and the reports are used as a comparison to one another over same number of years. The study period will be broken down into pre and post consolidation window.

3.3 Population of the study

The population is the totality of the object being studied. The population of this study comprises all companies quoted on the Nigeria Stock Exchange (NSE) as at 31st June 2019

3.4 Sample and Sampling Technique

Sampling is the practice of selecting a portion of the population that conforms to a stated set of specifications to be examined. For all intents and purposes, sampling technique is divided

into two major methods and they include probabilistic and non-probabilistic sampling techniques. Macroeconomic variables selected are exchange rate volatility, Monthly treasury bills rates and money supply. Verma & Verma (2007) suggest that stock market volatility are affected by economic fundamentals.

SN	SECTOR	NUMBER OF COMPANIES
1	Oil & Gas Exploration Companies	4
2	Commercial banks	14
3	Technology and Communication	3
4	Power Generation & Distribution	5
5	Real Estate investment Trust	1
6	Fertilizer	7
7	Cement	9
8	Transport	1
9	Inv. Banks / Inv. Cos. / Securities Cos.	1
10	Oil & Gas Marketing Companies	5
11	Food & Personal Care Products	5
12	Cable & Electrical Goods	1
13	Engineering	1
14	Textile weaving	1
15	Textile Composite	4
16	Insurance	5
17	Pharmaceutical	2

18	Synthetic & Rayon	1
19	Close - End Mutual Fund	1
20	Tobacco	2
21	Glass & Ceramics	1
22	Modarbas	1
23	Automobile Assembler	4
24	Chemical	2
25	Paper & Board	1
26	Refinery	2
27	Leasing companies	1
28	Automobile Parts & Accessories	1
29	Sugar & Allied Industries	1
30	Miscellaneous	3
31	Textile spinning	1
32	Leather & Tanneries	2
33	Woolen	1
34	Vanaspati & Allied Industries	1
35	Jute	1
	Total	96

3.5 Model Specification

The model is functionally specified as:

MktR= f(TBR,M2,OILp,EXR)……...(3.1)

The econometric form of the model is thus:

$MktR_{it} = \beta_O + \beta_1 TBR_{it} + \beta_2 M2_{it} + \beta_3 OILp_{it} + \beta_4 EXR_{it} + U_{it}$……..(3.2)

where:

MktR = Market return

TBR = Treasury bill rate

M2 = Money supply

OILp = Oil price

EXR = Exchange rate

U_{it} = stochastic error term

β_0, β_1, β_2, β_3 and β_4 are Parameters to be estimated

The a priori expectation is,

$B_0><0$, $\beta_1<0$, $\beta_2>0$, $\beta_3>$, $\beta_4<0$

3.6 Method of Data Collection

The data used for this study were extracted from secondary sources. Time period for the study is January 2000 - June 2019. Daily share price data is used for calculating the daily stock returns, market returns, oil returns and exchange returns. Calculations for the each

variable are then made on monthly basis. Daily data of share prices is gathered from Nigerian Stock Exchange website, data of treasury bills, money supply are collected from CBN.

3.7 Method of Data Analysis

This study examines the impact of stock price volatility on the performance of the Nigerian stock market for the period 2001 to 2019. To achieve this objective data were gathered on macroeconomic variables such as stock price volatility, market capitalization, exchange rate, interest rate and inflation rate were captured for the purpose of analysis.

The data were tested using the Elliot-Rothernberg-Stock Test, the Generalised Autoregressive Conditional Heteroskedasticity (GARCH) Test and the Granger Causality Test. The multivariate Johansen Cointegration Test was performed to establish the long run relationship among the variables. The Vector Error Correction Mechanism (VECM) under the framework of Vector Autoregressive (VAR) Model was used to estimate the short run relationship. The result of the GARCH test showed that volatility shocks in the Nigerian stock market were not quite persistent during the study period.

The result of the Cointegration test revealed that there exist long-run relationships among the variables in the model. The result of the Granger Causality test showed that stock price volatility granger caused market capitalization in Nigeria. The result of the short run estimation showed that stock price volatility is negatively related to stock market performance.

It is recommended that there is need to ensure stability of the stock market, so as to boost and restores investors confidence in the market. Such confidence will lead to increased investment in the market.

CHAPTER FOUR

EMPIRICAL ANALYSIS

4.1 Introduction

This chapter deals with the empirical results and analysis. The analysis of results begins with the presentation of descriptive statistics. Also, the correlation analysis of the variables is reported. These are followed by the presentation of the regression results. Finally, the tests of hypotheses are presented.

4.2 Descriptive Statistics

Descriptive statistics show the summary of data and other basic characteristics within the series. The descriptive statistics for variables of the study are reported in Table 4.1.

Table 4.1: Descriptive Statistics

	ASI	TBR	M2	OP	EXR
Mean	29629.12	9.444167	17725964	78.02543	211.6135
Maximum	44343.65	15.00000	28783194	124.9286	371.8200
Minimum	19851.89	0.000000	8720581.	30.80333	121.3600
Std. Dev.	6411.990	3.793802	5761123.	25.66831	77.99711
Skewness	0.466298	-0.702919	0.214455	0.203238	0.775327
Kurtosis	2.159025	2.590123	1.866249	1.674659	2.022803
Jarque-Bera	8.673359	11.79410	8.081452	10.56964	18.47692
Probability	0.013080	0.002748	0.017585	0.005068	0.000097

Source: Author's Computation using E-views 8.0

In Table 4.1, all share index (ASI) has a mean of 29629.12 over the period 2009 to 2019 with a standard deviation of 6411.99. The maximum and minimum amounts of ASI for

the period are 44343.65 and 19851.89 respectively. The value of skewness for ASI is 0.47. This means that the distribution of ASI is skewed to the right. Its kurtosis value of 2.16 which is less than 3 indicates that the distribution of ASI is flat. Jarque-Bera value of 8.67 with probability value less than the critical value of 5% indicates that ASI is not normally distributed.

Treasury bill rate (TBR) has a mean of 9.44% with a standard deviation of 3.79. The maximum and minimum rates of treasury bill for the period are 15% and 0.0% respectively. Its skewness value is -0.70 and it indicates that the distribution of treasury bill rate is skewed to the left. Its Kurtosis (2.59) indicates that the distribution is flat. The Jarque-Bera value of 11.79 with probability value less of 0.003 suggests that the variable is not normally distributed.

For broad money supply (M2), the mean value for the period under review is N17,725,964 million. Its maximum and minimum values for the period are N28,783,194 and N8,720,581 million respectively. Its skewness (0.21) shows that the distribution of M2 is positively skewed. Its Kurtosis (1.87) indicates that the distribution is flat. The Jarque-Bera statistic (8.08) with a p-value of 0.02 indicates that the variable is not normally distributed.

Oil price (OP) has a mean of $78.03 over the period 2009 to 2019 with a standard deviation of 25.67. The maximum and minimum amounts of oil price for the period are $124.93 and $30.80 respectively. The value of skewness for oil price distribution is 0.20. This means that its distribution is slightly skewed to the right slightly. Its kurtosis value of

1.67 which is less than 3 indicates that the distribution is relatively flat. Jarque-Bera value of 10.57 with probability value (0.01) indicates that oil price is not normally distributed over the period under review.

The average value of exchange rate (EXR) for the period under review is N211.61 to $1. The maximum and minimum values are N371.8 and N121.36 to $1 respectively. The skewness value (0.78) shows that EXR is positively skewed. Its Kurtosis (2.02) indicates that the distribution is flat. The Jarque-Bera value of 18.48 with probability value less than 1% suggests that the variable is not normally distributed.

4.3 Pair-wise Correlation

The correlation matrix among all the variables used in this study is reported in Table 4.2.

Table 4.2: Pair-wise Correlation Matrix

Correlation Probability	ASI	TBR	M2	OP	EXR
ASI	1.000000 -----				
TBR	0.240979 0.0054	1.000000 -----			
M2	0.430337 0.0000	0.354264 0.0000	1.000000 -----		
OP	0.065422 0.4561	0.234604 0.0068	-0.452383 0.0000	1.000000 -----	
EXR	0.238929 0.0058	0.238109 0.0060	0.923616 0.0000	-0.516683 0.0000	1.000000 -----

Source: Author's Computation using E-views 8.0

As shown in Table 4.2, all share index (ASI) is positively correlated with oil price though insignificant ($r = 0.065$, $p = 0.46$). However, all share index is positively correlated with exchange rate (EXR) and it is significant ($r = 0.23$, $p = 0.01$). Also, all share index is positively correlated with treasury bill rate ($r = 0.24$, $p = 0.01$) and broad money supply ($r = 0.43$, $p < 0.01$).

4.4 Results of Regression Model

The results of the model are presented in Table 4.3.

Table 4.3: Estimated Coefficients of the All Share Index Model

Dependent Variable: ASI

Regressor	Coefficient	Standard Error	T-Ratio	Probability
TBR	32.14313	102.0359	0.315018	0.7533
M2	0.000216	0.000357	0.605924	0.5457
OP	82.16818	30.13477	2.726691	0.0073
EXR	-19.44864	10.14564	-1.916946	0.0575
C	23896.92	9437.481	2.532129	0.0126
R-Squared 0.9207			R-Bar-Squared 0.9176	
F-Statistic 290.43 [< 0.01]			DW-Statistic 1.8517	

Source: Author's computation using EViews 8.0

The coefficient of determination of the all share index model, R-squared (R^2) is about 0.92 and the adjusted R-squared ($\overline{R}^2$) is 0.92. Hence, the adjusted R-squared indicates that about 92 percent of the systematic variations in the dependent variable are attributable to the explanatory variables. Therefore, the explanatory power of the model is quite high. The F-statistic is 290.43. It is significant at the 1% level. It implies that the model as a whole is significant. The Durbin-Watson statistic revealed that the residuals are not serially. Therefore, the model is adequate.

The signs of the estimated coefficients of the explanatory variables conform their a priori expectations. The coefficient of treasury bill rate (TBR) is positive though insignificant

even at the 10% level (t = 32.14, p = 0.75). Thus, treasury bill rate has a negative insignificant effect on all share index. In a similar vein, the coefficient of broad money supply (M2) turned out to be positive but insignificant even at the 10% level (t = 0.61, p = 0.55). Thus, broad money supply has a positive insignificant effect on all share index. The coefficient of oil price (OP) is positive. It is 82.17 with a t-statistic of 2.73. Its p-value is 0.01. The coefficient passed the statistical test of significance at the 1% level. This implies that $1 increase in oil price will lead to about 82.17 units increase in all share index. Thus, oil price has a favourable significant effect on all share index.

The coefficient of exchange rate (EXR) is negative and significant. The t-statistic (t = -1.92, p = 0.06) passed the significance test at the 10 percent level. This implies that exchange rate has a negative significant impact on all share index. It shows that when exchange rate depreciates by N1, the value of all share index will decrease by about 19.45 units.

4.5 Test of Hypotheses

On the basis of the regression results, we can test the validity of the hypothesis presented in chapter one of this research. Ho**:** There is no significant effect of Stock Price Synchronization on Market Volatility in Nigeria industries. From the regression results, the coefficients of treasury bill rate is insignificant at the 5% level. Accordingly, we cannot reject the null hypothesis that there is no significant effect of Stock Price Synchronization on

Market Volatility in Nigeria industries. This implies that stock price synchronization has an insignificant effect on market volatility.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

In this chapter, the main findings of the study are summarized. Next, the recommendations of the study are provided. Lastly, the conclusion is stated.

5.1 Summary of Findings

The major findings of this study are stated as follows:

1. It was found that treasury bill rate has a negative insignificant effect on all share index in Nigeria.
2. It was discovered that broad money supply has a positive insignificant effect on all share index in Nigeria.
3. Oil price was found to have a favourable significant effect on all share index in Nigeria.
4. It was discovered that exchange rate has a negative significant impact on all share index in Nigeria.

5.2 Recommendations

Based on the empirical findings of this research, the following recommendations have been proffered:

1. The Nigerian monetary authority should ensure exchange rate stability so as to encourage rate capital inflows in the economy.
2. To ensure effective expansionary monetary policy in the economy, the Central Bank of Nigeria should strengthen the financial system so that broad money supply in circulation can contribute significantly to the performance of the capital market.
3. Appropriate monetary measures should be undertaken to ensure stock price synchronization in order to the performance of the stock market in Nigeria.

5.3 Conclusion

This study was aimed at determining the impact of stock price synchronization on market volatility. It was found that treasury bill rate has a negative insignificant effect on all share index. This reveals that treasury bill rate is not a determinant of market volatility. It was also discovered that broad money supply has a positive insignificant effect on all share index in Nigeria. The implication is that money supply does not influence market volatility. This finding reveals that the transmission mechanism through which money supply influences all share index is ineffective. This suggests that monetary policies cannot be used effectively to determine the performance of the capital market in Nigeria. Again, it was found that oil price has a favourable significant effect on all share index. This suggests that increased global oil price enhances the performance of the capital market. Interestingly, exchange rate was found to have a negative significant impact on all share index. It was found that when the exchange rate depreciates, the value of all share index will fall. It is expected that exchange rate

depreciation will reduce the stock price for foreign investors. Hence, they will take an advantage of the depreciation of the naira to buy stocks in the capital market resulting increased transaction deals from more capital inflows. This will improve the performance of the stock market. However, our finding showed that a depreciation in exchange rate led to poor performance of the stock market. A possible explanation is that due to instability in the value of the naira, investors are pessimistic about stock prices and discouraged to invest in Nigerian stock market. Thus, there is need for government to ensure exchange rate stability in order to build investors' confidence in the value of the Nigerian currency and attract more capital inflows.

REFERENCES

Abugri, B. A. (2008). Empirical relationship between macroeconomic volatility and stock returns: Evidence from Latin American markets. *International Review of Financial Analysis, 17, 396-410.*

Adjasi, K., & Biekepe B. (2006), Stock exchange and economic growth: the case of selected African countries, *University of Stellenbosch Business School, Cape Town, South Africa*.

Ahmed, H. U., & Samad, Q. A. (2008). Performance level of Dhaka stock market: A

Ahmed, S. (2005). Reviving the role of regulators in Bangladesh capital market. *Pakistan Journal of Social Sciences, 3(4), 549-553.*

Alexopoulos, M., & Cohen, J. (2009). Uncertain times, uncertain measures. *Working Paper 352. University of Toronto.*

Alves, P., Peasnell, K., & Taylor, P. (2010). The Use of the R2 as a Measure of Firm-Specific Information: A Cross-Country Critique. *Journal of Business Finance & Accounting, 37(1-2), 1-26.*

An, H., & Zhang, T. (2013). Stock price synchronicity, crash risk, and institutional investors. *Journal of Corporate Finance, 21, 1-15.*

Augustine, U., & Pius, S.O (2010). Stock market development and economic growth: Evidence from Nigeria, *European Journal of Economics, Finance and Administrative Sciences, 25, 46-53.*

Bagchi, B. (2017). Volatility Spillovers between Crude Oil Price and Stock Markets: Evidence from BRIC Countries. *International Journal of Emerging Markets, 12(2). Page 53-65*

Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica 77. 623–685.*

Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity, *Journal of Econometrics, 31, 307-327.*

Campbell, J.Y., Lettau, M., Malkiel, B.G., & Xu, Y. (2001). Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk, *Journal of Finance 56, 1, 1-43.*

Chan, K., & Hameed, A. (2006). Stock price synchronicity and analyst coverage in emerging markets. *Journal of Financial Economics, 80(1), 115-147.*

Chiang, C. H., Chung, S. G., & Louis, H. (2017). Insider trading, stock return volatility, and the option market's pricing of the information content of insider trading. *Journal of Banking & Finance*, 76, 65-73.

Chinzara, Z. (2011). Macroeconomic uncertainty and conditional stock market volatility in South Africa. *South African Journal of Economics, 79, 27-49.*

Chinzara, Z. (2011). Macroeconomic uncertainty and conditional stock market volatility in South Africa. *South African Journal of Economics*, 79(1), 27-49.

Chinzara, Z., & Aziakpono, M.J. (2009). Dynamic Returns Linkages and Volatility Transmission between South African and World Major Stock Markets. *Working Paper 146*.

Daouk, H., Lee, C. M., & Ng, D. (2006). Capital market governance: How do security laws affect market performance?. *Journal of Corporate Finance, 12(3), 560-593.*

Deb, P., Koo, B., & Liu, Z. (2014). Competition, premature trading and excess volatility. *Journal of Banking & Finance*, 41, 178-193.

Döpke, J., Hartmann, D., & Pierdzioch, C. (2005). Forecasting stock market volatility with macroeconomic variables in real time. *Banking and Financial Studies 2006, 01, Deutsche Bundes bank, Research Centre. Discussion Paper Series 2.*

Du, J., & Wei, S. J. (2004). Does insider trading raise market volatility?. *The Economic Journal*, 114(498), 916-942.

Durnev, A., Morck, R., Yeung, B., & Zarowin, P. (2003). Does greater firm-specific return variation mean more or less informed stock pricing?. *Journal of Accounting Research*, 41(5), 797-836.

Engle, R.F. (1982). Autoregressive conditional heteroskedasticity with estimates of the variance of United Kingdom inflation. *Econometrica, 50, 987-1008.*

Guo, H. (2002). Stock market returns, volatility, and future output, *Federal Reserve Bank of St. Louis Review 84, 75-86.*

Guo, H., & Savickas, R. (2006). Idiosyncratic volatility, stock market volatility, and expected stock returns. *Journal of Business & Economic Statistics*, 24(1), 43-56.

Gupta R., & Modise, M.P. (2011), Macroeconomic Variables and South African Stock Return Predictability. Working Paper.

Hameed, A., Kang, W., & Viswanathan, S. (2010). Stock market declines and liquidity. *The Journal of Finance*, 65(1), 257-293.

Jahangirnagar *Review, (29), 195-202*.

Jin, L., & Myers, S. C. (2006). R 2 around the world: New theory and new tests. *Journal of financial Economics, 79(2), 257-292*

Lau, C. K. M., Demir, E., & Bilgin, M. H. (2013). Experience-based corporate corruption and stock market volatility: Evidence from emerging markets. *Emerging Markets Review*, 17, 1-13.

Levine, R. & Zervos, S. (1998). What we have learnt about policy and growth from cross-country regressions. *American Economic Review, 83(2) 426-440*

Marhfor, A., M'Zali, B., Cosset, J. C., & Charest, G. (2013). Stock price informativeness and analyst coverage. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration, 30(3), 173-188.*

Morck, R., Yeung, B., & Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements?. *Journal of financial economics, 58(1), 215-260.*

Morck, R., Yeung, B., & Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements?. *Journal of financial economics*, 58(1), 215-260.

Naceur, S.B., & Ghazouani, S., (2007). Stock markets, banks, and economic growth: empirical evidence from the MENA region. *Research in International Business and Finance, 21, 297–315.*

Nelson, D. B. (1991). Conditional heteroskedasticity in asset returns: A new approach. *Economietrica, 59, 347-370*.

Nguyen, N. H., & Truong, C. (2013). The information content of stock markets around the world: A cultural explanation. *Journal of International Financial Markets, Institutions and Money, 26, 1-29.*

Osinubi, T. S., & Amaghionyeodiwe, L.A. (2003). Stock market development and long-run growth in Nigeria. *Journal of African Business, 4 (3), 103-129.*

Pilinkus, D. (2010). Macroeconomic indicators and their impact on stock market performance in the short and long run: the case of the Baltic States. *Technological and Economic Development of Economy*, 16(2), 291-304.55

Poterba, J. M. (2000). Stock market wealth and consumption. *Journal of Economic Perspectives, 14(2), 99- 118.*

Rahman, M. L., & Rahman, M. Z. (2007). Stock price variability: *Evidence from Bangladesh.*

Raju, M. T., & Ghosh, A. (2004). Stock market volatility – An international comparison. Securities and Exchange Board of India, *Working Paper Series 8.*

Uddin, M. B. (2009). Determinants of market price of stock: A stock on bank leasing and insurance companies of Bangladesh. *Journal of modern Accounting and Auditing, 5 (7) page 123-141*

Umutlu, M., Akdeniz, L., & Altay-Salih, A. (2010). The degree of financial liberalization and aggregated stock-return volatility in emerging markets. *Journal of banking & finance, 34(3), 509-521.*

Uppal, J. Y., & Mangla, I, U. (2006). Regulatory response to market volatility and manipulation: A case study of Mumbai and Karachi stock exchanges. *The Lahore Journal of Economics, 11 (2) 79-105.*

Venezia, I., Nashikkar, A., & Shapira, Z. (2011). Firm specific and macro herding by professional and amateur investors and their effects on market volatility. *Journal of Banking & Finance*, 35(7), 1599-1609.

Verma, R., & Verma, P. (2007). Noise trading and stock market volatility. *Journal of Multinational Financial Management, 17(3), 231-243.*

Verma, R., & Verma, P. (2007). Noise trading and stock market volatility. *Journal of Multinational Financial Management, 17 (3).*

Wang, X. (2010). The Relationship between stock market volatility and macroeconomic volatility: Evidence from China. *International Research Journal of Finance and Economics, 49, Euro Journals publishing, Inc. Vol 3. Issue (55) Page 145-167*

APPENDIX

	ASI	TBR	M2	OP	EXR
2009M01	21813.76	3.880000	9294036.	44.71909	121.3600
2009M02	23377.14	2.000000	9087967.	43.24250	123.8700
2009M03	19851.89	2.530000	8997817.	46.83909	126.3700
2009M04	21491.11	3.330000	9001008.	50.98318	128.8700
2009M05	29700.24	3.270000	8720581.	57.94143	131.3800
2009M06	26861.55	3.320000	9077027.	68.61682	133.8800
2009M07	25286.61	3.930000	8889359.	64.91000	136.3800
2009M08	23009.10	4.800000	9475325.	72.50476	138.8900
2009M09	22065.00	4.800000	9458490.	67.68727	141.3900
2009M10	21804.69	5.080000	9911551.	73.19409	143.8900
2009M11	21010.29	4.480000	10239558	77.03667	146.4000
2009M12	20827.17	4.000000	10780627	74.70000	148.9000
2010M01	22594.90	3.720000	10446374	76.41238	148.9700
2010M02	22985.00	2.330000	10792645	74.31200	149.0400
2010M03	25966.25	1.040000	11023313	79.27478	149.1100
2010M04	26453.20	1.200000	10972488	84.92864	149.1800
2010M05	26183.21	1.630000	10759315	76.25095	149.2500
2010M06	25384.14	2.290000	10845498	74.83818	149.3200
2010M07	25844.18	2.940000	10941435	74.73545	149.3900
2010M08	24268.24	2.630000	11520645	76.69318	149.4600
2010M09	23050.59	6.600000	11224790	77.78682	149.5300
2010M10	25042.16	6.750000	11224607	82.91810	149.6000
2010M11	24764.65	7.580000	11142651	85.67000	149.6700
2010M12	24770.52	7.470000	11525530	91.79652	149.7400
2011M01	26827.28	7.490000	11561526	96.29476	150.0800
2011M02	26016.84	7.090000	11595668	103.9550	150.4300
2011M03	24621.21	8.270000	11653624	114.4413	151.7700
2011M04	25041.68	9.520000	11898957	123.1505	151.1100
2011M05	25866.62	8.630000	11986235	114.4582	151.4600
2011M06	24980.20	8.200000	12172097	113.7577	151.8000
2011M07	23826.99	7.080000	12389275	116.4610	152.1400
2011M08	21497.61	7.410000	12508015	110.0813	152.4900
2011M09	20373.00	8.920000	12618080	112.4468	152.8300
2011M10	20934.96	15.00000	12172500	109.4690	153.1700
2011M11	20003.37	14.53000	12210412	110.5041	153.5200
2011M12	20730.63	14.27000	13303495	107.9700	153.8600
2012M01	20875.83	14.85000	13755293	110.9936	154.1100

2012M02	20123.51	14.76000	13153787	119.7024	154.4700
2012M03	20652.47	14.49000	13270974	124.9286	154.7700
2012M04	22045.66	13.92000	13304784	120.5910	155.0700
2012M05	22066.40	13.34000	13603139	110.5217	155.3700
2012M06	21599.57	14.08000	13480391	95.58905	155.6800
2012M07	23061.38	13.86000	13392426	103.1409	155.9800
2012M08	23750.82	14.26000	13770062	113.3400	156.2800
2012M09	26011.64	12.75000	14065267	113.3825	156.5800
2012M10	26430.92	12.94000	14399299	111.9735	156.8900
2012M11	26495.10	12.60000	15062730	109.7118	157.1900
2012M12	28078.81	11.77000	15483848	109.6400	157.4900
2013M01	31853.19	11.17000	15308393	112.9287	157.4800
2013M02	33075.14	9.900000	15547625	116.4550	157.4600
2013M03	33536.25	10.17000	15669169	109.2400	157.4500
2013M04	33440.57	10.41000	15634382	102.8755	157.4300
2013M05	37794.75	10.64000	15424053	103.0270	157.4200
2013M06	36159.87	11.60000	15593173	103.1100	157.4000
2013M07	37914.33	11.56000	14811430	107.7161	157.3900
2013M08	36248.53	11.30000	14619449	110.9650	157.3700
2013M09	36585.08	10.91000	14362451	111.6214	157.3600
2013M10	37622.74	10.80000	14529508	109.4791	157.3400
2013M11	38920.85	10.80000	14734883	108.0767	157.3300
2013M12	41329.19	10.97000	15688964	110.6336	157.3100
2014M01	40571.62	10.81000	15493690	107.5704	157.6500
2014M02	39558.89	11.82000	15424175	108.8120	157.9900
2014M03	38748.01	11.92000	17732919	107.4057	158.3300
2014M04	38485.56	11.26000	17886648	107.8755	158.6700
2014M05	41474.40	10.13000	17622558	109.6759	159.0100
2014M06	42482.48	9.980000	17576640	111.8686	159.3600
2014M07	42097.49	9.880000	18102243	106.9830	159.7000
2014M08	41532.33	9.950000	17898902	101.9224	160.0400
2014M09	41210.10	9.750000	18200157	97.33636	150.3800
2014M10	37550.24	9.830000	18496198	87.26957	160.7200
2014M11	34543.05	9.820000	18804280	78.43800	151.0600
2014M12	34657.15	10.80000	18913029	62.16304	161.4000
2015M01	29562.07	11.20000	18965534	48.41682	163.3600
2015M02	30103.81	10.88000	18865922	57.93050	168.9900
2015M03	31753.15	10.77000	19132363	55.79136	174.5500
2015M04	34708.11	10.23000	19608079	59.38955	180.0700
2015M05	34310.37	10.03000	19196565	64.56143	185.5200
2015M06	33456.83	9.950000	18811429	62.34591	190.9300

2015M07	30180.27	10.00000	18424703	55.86565	196.2700
2015M08	29684.84	10.00000	18491572	46.99429	201.5700
2015M09	31217.77	10.36000	18718003	47.23455	206.8000
2015M10	29177.72	9.110000	18204396	48.12409	211.9900
2015M11	27385.69	5.620000	18367239	44.41714	217.1100
2015M12	28642.25	4.570000	20029831	37.72174	222.1900
2016M01	23916.15	4.120000	19799458	30.80333	227.2000
2016M02	24570.73	4.910000	20620803	33.19810	232.1700
2016M03	25306.22	5.530000	20470436	39.07174	237.0800
2016M04	25062.41	7.270000	20727909	42.24762	241.9300
2016M05	27671.08	8.040000	21035132	47.13273	246.7300
2016M06	29597.79	8.320000	22078013	48.47818	251.4700
2016M07	28009.93	12.34000	22535193	45.07095	256.1600
2016M08	27599.03	14.93000	22057001	46.14435	260.7900
2016M09	28335.40	14.00000	22013781	46.18864	265.3700
2016M10	27220.09	13.96000	22180072	49.73238	269.8900
2016M11	25241.63	13.99000	22386048	46.43591	274.3600
2016M12	26874.62	13.97000	23591733	54.06636	278.7700
2017M01	26036.24	13.95000	23096527	54.89273	283.7700
2017M02	25329.08	13.75000	22210955	55.49350	287.7700
2017M03	25516.34	13.60000	22304268	51.96826	291.6800
2017M04	25767.26	13.58000	21768241	53.06350	295.8800
2017M05	29498.31	13.50000	22047771	50.87087	300.0100
2017M06	33117.48	13.50000	21980582	46.89455	304.1000
2017M07	35847.75	13.46000	22195020	48.69000	308.1200
2017M08	35504.62	13.35000	21851454	51.36957	312.1000
2017M09	35439.98	13.20000	21953994	55.16286	316.0200
2017M10	36680.29	13.18000	22500618	57.61773	319.8800
2017M11	37944.60	13.01000	22311118	62.57545	323.6900
2017M12	38243.19	0.000000	24140634	64.21190	327.4400
2018M01	44343.65	12.27000	23963031	68.98652	286.5300
2018M02	43330.54	11.88000	24143010	65.42200	292.8800
2018M03	41504.51	11.84000	24424422	66.44545	295.1800
2018M04	41268.01	11.43000	24474154	71.62762	219.4300
2018M05	38104.54	10.00000	25169014	76.64696	303.6100
2018M06	38278.55	10.11000	24814005	75.19143	307.7500
2018M07	37017.78	10.00000	24971102	74.43773	371.8200
2018M08	34848.45	10.64000	24859346	73.12870	315.8400
2018M09	32766.37	11.00000	25560662	78.86000	319.8100
2018M10	32466.27	10.94000	26041904	80.47043	323.7200
2018M11	30874.17	10.91000	25467426	65.17364	327.5700

2018M12	31430.50	0.000000	27068575	56.46381	331.3700
2019M01	30557.20	10.98000	26771087	59.27261	360.9400
2019M02	31718.70	10.91000	26546640	64.13400	359.7600
2019M03	31041.42	10.42000	26834815	66.41095	359.2400
2019M04	29159.74	10.24000	27579445	71.19682	359.0000
2019M05	31069.37	10.00000	27813702	70.52652	359.7500
2019M06	29966.87	9.930000	27898828	63.29600	359.9400
2019M07	27718.26	9.920000	28277142	64.00000	359.4300
2019M08	27525.81	10.89000	27556799	59.24727	359.0000
2019M09	27630.56	11.10000	27669957	62.33000	359.0000
2019M10	26355.35	10.03000	27811791	59.37000	359.0000
2019M11	27002.15	6.730000	28415372	62.74429	359.0000
2019M12	26842.07	4.470000	28783194	65.85455	360.2500

	ASI	TBR	M2	OP	EXR
Mean	29629.12	9.444167	17725964	78.02543	211.6135
Median	27864.09	10.20000	17892775	73.75305	158.8400
Maximum	44343.65	15.00000	28783194	124.9286	371.8200
Minimum	19851.89	0.000000	8720581.	30.80333	121.3600
Std. Dev.	6411.990	3.793802	5761123.	25.66831	77.99711
Skewness	0.466298	-0.702919	0.214455	0.203238	0.775327
Kurtosis	2.159025	2.590123	1.866249	1.674659	2.022803
Jarque-Bera	8.673359	11.79410	8.081452	10.56964	18.47692
Probability	0.013080	0.002748	0.017585	0.005068	0.000097
Sum	3911044.	1246.630	2.34E+09	10299.36	27932.98
Sum Sq. Dev.	5.39E+09	1885.474	4.35E+15	86310.93	796945.0
Observations	132	132	132	132	132

Covariance Analysis: Ordinary
Date: 07/09/21 Time: 21:21
Sample: 2009M01 2019M12
Included observations: 132

Correlation Probability	ASI	TBR	M2	OP	EXR
ASI	1.000000 -----				
TBR	0.240979 0.0054	1.000000 -----			
M2	0.430337 0.0000	0.354264 0.0000	1.000000 -----		
OP	0.065422 0.4561	0.234604 0.0068	-0.452383 0.0000	1.000000 -----	
EXR	0.238929 0.0058	0.238109 0.0060	0.923616 0.0000	-0.516683 0.0000	1.000000 -----

Dependent Variable: ASI
Method: Least Squares
Date: 07/09/21 Time: 21:15
Sample: 2009M01 2019M12
Included observations: 132
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TBR	-198.0652	264.5957	-0.748558	0.4555
M2	0.001658	0.000401	4.135857	0.0001
OP	66.04159	36.51810	1.808462	0.0729
EXR	-79.91953	28.84582	-2.770575	0.0064
C	13875.94	3788.087	3.663046	0.0004

R-squared	0.397703	Mean dependent var	29629.12
Adjusted R-squared	0.378733	S.D. dependent var	6411.990
S.E. of regression	5053.963	Akaike info criterion	19.93088
Sum squared resid	3.24E+09	Schwarz criterion	20.04007
Log likelihood	-1310.438	Hannan-Quinn criter.	19.97525
F-statistic	20.96482	Durbin-Watson stat	0.196862
Prob(F-statistic)	0.000000	Wald F-statistic	11.94248
Prob(Wald F-statistic)	0.000000		

Dependent Variable: ASI
Method: Least Squares
Date: 07/09/21 Time: 21:18
Sample (adjusted): 2009M02 2019M12
Included observations: 131 after adjustments
Convergence achieved after 12 iterations
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TBR	32.14313	102.0359	0.315018	0.7533
M2	0.000216	0.000357	0.605924	0.5457
OP	82.16818	30.13477	2.726691	0.0073
EXR	-19.44864	10.14564	-1.916946	0.0575
C	23896.92	9437.481	2.532129	0.0126
AR(1)	0.959390	0.024831	38.63708	0.0000

R-squared	0.920743	Mean dependent var	29688.78
Adjusted R-squared	0.917573	S.D. dependent var	6399.722
S.E. of regression	1837.370	Akaike info criterion	17.91478
Sum squared resid	4.22E+08	Schwarz criterion	18.04647

Log likelihood	-1167.418	Hannan-Quinn criter.	17.96829
F-statistic	290.4294	Durbin-Watson stat	1.851661
Prob(F-statistic)	0.000000	Wald F-statistic	2.670565
Prob(Wald F-statistic)	0.035201		

Inverted AR Roots	.96