Interaction between Monetary Policy and Stock Market Performance: Evidence from Selected Developing African Economies (1986- 2016)

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DECLARATION

This is to declare that this research work titled "Interaction between Monetary Policy and Stock Market Performance: Evidence from selected developing African Economies (1986-2016)" was carried out by Izundu, Gloria Obiageli; Reg. No. 2013417006P. To the best of my knowledge, this work is original and has not been previously submitted to this University or other institution.

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APPROVAL

We hereby certify that this dissertation titled "Interaction between Monetary Policy and Stock Market Performance: Evidence from selected African Developing Economies (1986 – 2016)" by Izundu, Gloria Obiageli with Registration No. 2013417006P, satisfied the standard in partial fulfillment of the requirements for the award of Doctor of Philosophy (Ph.D) in Banking and Finance.

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DEDICATION

This Dissertation is fondly dedicated to my Husband, Prof. A. I. Izundu and my lovely children Chisom, Chukwunedu, Kosisochukwu and Nzubechukwu.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract

Monetary Policy actions should result to increase in Stock Market Performance but some findings from studies appear to disagree with this preposition. This study therefore examined the interaction between monetary policy and Stock Market Performance in Selected Developing African Economies from 1986 to 2016.The specific objectives of this study were to analyse the interaction between money supply (M2), consumer price index (CPI), deposit money bank total credit (TBC), foreign exchange rate (EX) and market capitalization (MC) in selected African developing economies. The study selected Nigeria, South Africa and Kenya as its sample. The study anchored on Tobin's monetary theory and stock returns and used secondary data obtained from World Bank, International Monetary Fund, Bureau of Statistics, Knoema and the Central Bank of selected countries. The study used the Ordinary Least Square (OLS),Granger Causality test and Generalized Least Square (GLS) Panel Data Analysis techniques, to test the interaction between independent variables namely money supply (M2), consumer price index (CPI), deposit money bank total credit (TBC) and foreign exchange rate (EX) and dependent variable -market capitalization (MC) at the 5% level of significance. The findings amongst others showed that monetary policy had an insignificant relational effect on market capitalization in Nigeria, Kenya and South Africa; while the selected African developing economies' pooled panel result indicated that Monetary policy variables used had both positive and negative significant relational effect on market capitalization. The study using granger causality test showed that market capitalization did not granger cause changes in the monetary policy variables and vice versa. Thus, the study concluded that monetary policy did not affect stock market performance but however have a relational relationship with market capitalization. Hence, recommended among others the implementation of market-friendly monetary policy to encourage increased investment in the economy and stock market; and reduce capital flight into foreign appreciating economy and stock market.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Monetary policy and stock market within the developing economies of Africa has been the focus of a large body of contemporary research. Monetary policy is the process by which a central bank in a country influences the availability and cost of money/credit (Ogu & Pavis, 2012). They are usually undertaken to restore or maintain stability within an economy and such policies can either be expansive or restrictive with Central banks using interest rates, inflation rate and money supply as monetary policy instruments (Bissoon, Seetanah, Bhattu-Babajee, Gopy-Ramdhany & Seetah, 2016 & Muktadir-Al-Mukit, 2013).The aim is to attain certain macroeconomic objectives, which are geared towards the growth and stability of the economy (Sellin, 2002). Arguably, monetary policy has experienced difficulty in the determination of an improved stock market, because developing economies has a very low degree of economic openness, higher tendency for transferred (imported) inflation, variations in trade pattern, uneven distribution of natural resources and variations in the value of exportable, inadequate effectiveness of monetary policy transmission mechanism, underdeveloped financial system, lack of Central Bank independence, foreign exchange rate volatility, inadequate infrastructure and lack of political commitment, which has adverse implications for monetary policy; following which, there is manifest difficulty in setting monetary policy targets and the choice of monetary policy instruments to be utilized and with implications for the stock market (UNCTAD, 2015). For instance, in Nigeria record shows that market capitalization was $2.373Billion as at 2002 and grew drastically to $84.874Billion in 2007 at over 3577% growth but fell drastically the next year to $48.062Billion in 2008 by -43.36%. As at 2014, the market capitalization was

$62.766Billion and fell continuously to $49.973 and further to $29,792Billion in 2015 and 2016 the end period of study at -20.38% and -40.38% respectively (World Bank, 2016). In Kenya, the market capitalization was $1.431Billion in 2002 and grew to $4.182Billion in 2003 at 192.21%, but had the highest market capitalization in 2010 at $14.460Billion. The market capitalization fell in 2011 to $10.202Billion by -29.45% (World Bank, 2016). However, in South Africa the market capitalization maintains a high figure all through from $147.471Billion in 2001 to $828.185Billion in 2007. The market capitalization continued on a zigzag growth process and ended at $951.320Billion in 2016 (World Bank, 2016). The record shows that South Africa have been more efficient in the African stock exchange compared to the other two stock exchanges under study.

Identifying the link between monetary policy and stock market performance is highly important to gain a better insight in its interaction, since changes in stock market performance play a key role in several channels of interaction with monetary policy. Therefore, it would be important to determine how contractionary or expansionary; accommodative, neutral or tight monetary policy affects the performance of the stock markets of various developing countries and whether there are any well-defined systems for implementing monetary policy that would lead to better stock market performance all around the world. This research seeks to answer the questions; What are the effects of monetary policy instruments on stock market performance?; How do variations in money supply, consumer price index, foreign exchange rate and deposit money banks total credit affect the performance of stock market represented by market capitalization?.

The linkage between monetary policy decisions and stock markets' performance is an important study for several reasons, especially considering the wide consensus among investors.

Researchers like Bernanke and Kuttner (2005) stated that having reliable estimates of the reaction of stock market performance indices to monetary policy instrument is important since it makes it easier for economists and central bankers to understand the function, and to assess the effectiveness of stock market channels for monetary policy transmission.

The recent global financial crisis has motivated various researches on the interdependence between monetary policy and stock markets' assets prices worldwide (Iglesias & Haughton, 2011). It is believed that monetary policy has the potential to address the problem of foreign exchange rate fluctuations, facilitate international trade and payment system, it also tends to reduce transaction cost, production costs and foreign exchange rate uncertainty, it helps to develop the financial system, it enhances price transparency, greater competition and efficiency. However, Seoul (2013) state that monetary growth also affects interest rates and prices and these in turn will influence the stock prices (stock market performance).

The response of the financial markets towards monetary policy depends on market efficiency and the degree of development of both financial institutions and equity culture in the market (Onyeke, 2016).

Consequently, the interaction between monetary policy and stock market performance has a strong implication for the improvement of developing economies. The Stock market is a financial market where securities (assets) are traded; hence the market is highly delicate to monetary policy operation.

Since the last decade, there has been increased consideration to Stock market performance as it interacts with monetary policy in the developing economies. The growing focus is fairly because; of the important role the Stock market plays in developing economies,

especially in its response to monetary policy. It is on this premise that the Stock market performance in developing economies remains the hallmark of monetary policy effectiveness.

All African economies according to World Economic Situation and Prospect (2014) are developing economies. They are characterized with low and medium level of income, low standard of living and low GNI per capita. For instance, to maintain compatibility with similar classifications used else-where, the threshold levels of GNI per capita are those established by the World Bank. Countries with less than $1,035 GNI per capita are classified as low-income countries, those with between $1,036 and $4,085 as lower middle income countries, those with between $4,086 and $12,615 as upper middle income countries, and those with incomes of more than $12,615 as high-income countries (World Bank, 2016). Nigeria, Kenya and South Africa fall into the first and second categories thus confirming their status as developing economies.

There is however low literature and empirical evidence to show the interaction between monetary policy and stock market performance of developing countries in general and African countries in particular. It is also observed that most researchers conducted in the past focus only on a particular developing country or region and such results are highly inconclusive. This research therefore intends to fill that gap. Also, most of the literature examined the effects of monetary policy on stock market prices but say little or nothing on the market capitalization. On this premise, this study seeks to fill this gap by using data for market capitalization, thereby improving upon the existing knowledge on this topic.

1.2 Statement of the Problem

Despite the growing attention on the influence of monetary policy on Stock market performance, in contrast, less attention has been paid to the reverse relationship; especially in

developing economies, yet Stock market behavior is expected to determine the potency of monetary policy towards economic performance.

The relationship between monetary policy and stock markets can be viewed in two folds: the effects of monetary policy on stock market performance and the effects of stock market performance on monetary policy. Economists' views and opinions on this issue are divergent. Considering the issue of the effects of stock markets performance on monetary policy, the response of stock market indices to central bank monetary policy is a key component for analyzing the impact of monetary policy on stock market performance of developing economy and because of their potential impact on the macro-economy, stock market performance are likely to be an important determinant of monetary policy decisions. The 1987 American stock market crash has made economists examine empirically if monetary policy has been influenced by stock market activities.

Although several studies have discussed the relationship between stock market performance and macroeconomic variables, this study in its peculiarity examines the effect of interaction between monetary policy and stock market performance within developing countries in Africa.

Thus, the relationship between the monetary policy and stock market in a panel of developing countries has not been established in any previous studies to the best of our knowledge hence, the need to domesticate the study of this nature. In addition, extensive discussion has also taken place of the monetary policy performance of individual developing countries. What is lacking in the earlier studies as far as developing countries are concern is the influence of monetary policy on performance of stock markets and vice versa.

Various studies have been carried out on monetary policies and stock market performance (indicators). For example, Iglesias and Haughton (2011) analyze the interaction between monetary policy and stock prices in Barbados, Jamaica and Trinidad and Tobago both individually and jointly, the result of the study showed mixed individual findings but the joint findings showed that positive stock price shock causes an increase in treasury bills while a positive monetary policies shock cause stock prices to fall; Seoul (2013) and Muktadir-Al-Mukit (2013) however holds that monetary policies causes a positively increasing change on stock exchange performance; Mbulawa (2015) also reveal that stock market performance motivate the direction of Monetary policy instruments. From literature standpoint, there is no clear evidence on the relationship between monetary policy and stock market performance. Also, the relationship between monetary policy instruments and stock market performance has been inconclusive.

Moreover, in Kenya, Nigeria and South Africa, a lot has been done to create an enabling environment for the successful operation of the stock exchange, addressing the issue of inter-temporal interaction between monetary policy, monetary policy intermediate targets and stock market activities which will provide answers to the simultaneous response of the stock market to monetary policy reaction. It is thus the purpose of this study to investigate the interaction between monetary policy and stock market performance.

1.3 Objectives of the Study

The broad objective of this study is to examine the interaction between monetary policy and stock market performance in selected African developing economies. The specific objectives include:

1. To examine the relationship between money supply and stock market performance of selected African developing economies.
2. To analyze the relationship between deposit money banks total credit and stock market performance of selected African developing economies.
3. To asses the relationship between consumer price index and stock market performance of selected African developing economies.
4. To ascertain the relationship between foreign exchange rate and stock market performance of selected African developing economies.
5. To ascertain the direction of causality between monetary policy and stock market performance of selected African developing economies.

1.4 Research Questions

Our study seeks to answer the following questions;

1. Is there any significant relationship stock market performance of selected African developing economies?
2. What is the extent of relationship between deposit money banks total credit and stock market performance of selected African developing economies?
3. What is the degree of relationship between consumer price index and stock market performance of selected African developing economies?
4. What is the extent of relationship between foreign exchange rate and stock market performance of selected African developing economies?
5. What is the direction of causality between monetary policy and stock market performance of selected African developing economies?

1.5 Research Hypotheses

This study is to be guided by the following hypotheses;

H_{o1}: Money supply has no significant relationship with stock market performance of selected African developing economies.

H_{o2}: Deposit money banks total credit have no significant relationship with stock market performance of selected African developing economies.

H_{o3}: There is no significant relationship between consumer price index and stock market performance of selected African developing economies.

H_{o4}: Foreign exchange rate has no significant relationship with stock market performance of selected African developing economies.

H_{o5}: There is no causal effect between monetary policy and stock market performance of selected African developing economies.

1.6 Significance of the Study

The main motivation for this study is to enable policy makers appreciate the growing need to articulate a more efficient monetary policies that will be responsive to changes in stock market performance when they come across this research work, since the stock market is a veritable source of long-term capital. The effectiveness of monetary policy should therefore be anchored on the influence of its instruments on stock market performance.

This research work shall be useful to managers of the African economies, the central banks of developing economies in Africa, policy makers, finance literature and the general public at large as it shall reveal the effect of interaction between monetary policy and stock market performance within the developing economies when they come across this work.

It shall also be of great use to the monetary authorities in knowing the interaction between monetary policy and stock market performance, and other target variables. On the part of the government, it shall help to clarify the influence of Central Bank's monetary policy in effecting the development of the capital market. It is hoped that this research will be of great assistance to all those who wish to carry out further research on the relationship between monetary policy and capital market activities in developing economies.

1.7 Scope of the Study

The data of most developing African economies that would have been included were not available at the time of collection from the data base of World Bank, International Monetary Fund, National Bureau of Statistics and their respective Central Banks between 1986 and 2016; hence we used three major countries that we could conveniently and reliably obtain their data from the data base and covered a period of 31 years from 1986 to 2016.

The study selected three developing African economies stock markets which gave a realistic analytical depth of the developing African economies situation. The criteria for such selection were;

i. life span of the stock market; and
ii. The size of its market capitalization.

The developing African economies were unbundled into three regions namely West Africa, Southern Africa and Central and East Africa; and countries with the highest volume of selected criteria as stated were chosen. The selected sample markets based on the above are;

1. Nigerian Stock Exchange (NSE), Nigeria.
2. Johannesburg Stock Exchange (JSE), South Africa.
3. Nairobi Stock Exchange, Kenya.

Thus, the study focuses on Kenya, Nigeria and South Africa. They also represent major relevant stock markets in the Continent. Also, these countries have identified monetary policy as a strategic force to induce the performance of stock markets; because of its significant spill-over potential in the overall economy. Consequently, this study covers the period 1986 to 2016 to identify with the effect of the conditions of IMF in structural adjustment programme introduced across African economies in 1986 and after effect of global economic meltdown of the 2008 to 2011 with economic recession experienced in developing African economies.

1.8 Limitations of the Study

However, the study is constrained in the following ways.

1. The cross country Stock Exchange information provided by the different stock markets reflected the different accounting and financial policies adopted by their stock Exchanges across the countries. The data generated therefrom had to be reclassified and converted into the same comparable units and standard international currency, which was difficult.
2. The study is challenged by the differences in the secondary data sources and conversion difficulties experienced as most data were in domestic currency.
3. The study is also constrained to secondary data and as such the validity and accuracy of the data used are not within the control of the researcher.
4. Also, the different financial policies adopted by stock Exchanges of developing countries in Africa are as well not within the control of the researcher.
5. The researcher collected annual data for only 31 years covering 1986 to 2016, which was sufficient in statistical terms but less than what was originally intended for this research.

All these limitations however do not affect the credibility of data gathered and the standard required for the study.

1.9 Definition of Operational Terms

Consumer Price Index (CPI): The CPI is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. i.e. it measures changes in the price level of market basket of consumer goods and services purchased by households. The CPI is a statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically.

Foreign Exchange: foreign exchange is the exchange of one currency for another by governments, businesses and residents in two different countries. A foreign exchange market exist wherever the trade of two foreign currencies are taking place

Deposit Money Banks Total Credit: Bank total credit is the aggregate amount of credit made available to persons or businesses from banking institution in a country. It is the total amount of funds financial institutions provide to individuals or businesses in a country. Bank credit is the total borrowing capacity banks provide borrowers. It allows borrowers to buy goods or services. It is also the aggregate amount of credit available to a person or business from a banking institution.

Money Supply: This is a core monetary policy instrument. In economics, the money supply (or money stock) is the total amount of monetary assets available in an economy at a specific time.

Market Capitalization: This is the total value of all equity securities listed on a stock exchange and it is a function of the prevailing market price of quoted equities and the size of their issued and paid up capital. It is a summary measure of the performance of the capital market (Sukcharoensin & Sukcharoensin, 2013).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Monetary Policy

The Central Bank use monetary policy to achieve the goals of macroeconomic management. Monetary policy is a set of actions through which the monetary authority determines the conditions under which it supplies the money that circulates in the economy. Monetary policy therefore has an effect on short-term interest rates.

According to Onyeiwu (2012), monetary policy is a technique of economic management that brings about Sustainable economic growth and development.

Monetary Policy refers to the specific actions taken by the Central Bank to regulate the value, supply and cost of money in the economy with a view to achieving Government's macroeconomic objectives. Monetary policy in the Nigerian context refers to the actions of the Central Bank of Nigeria to regulate the money supply, so as to achieve the ultimate macroeconomic objectives of government (CBN, 2016). Monetary policy is employed as a tool to control or influence monetary aggregates such as interest rates, money supply and bank credit, including the exchange rate, with a view to achieving set policy targets such as tackling unemployment, inflation, economic growth, etc. In this regard therefore, monetary policy plays an important role towards achieving the ultimate economic objectives of sustainable growth, full employment, price stability and a healthy balance of payments (CBN, 2015). In the pursuit of these goals, the central bank sets intermediate objectives for monetary policy. These are goals which relate to using interest rates, growth in money supply and the foreign exchange rate to achieve the ultimate goals of monetary management.

The direction of monetary policy is dictated by the prevailing economic situation and Policy Objectives which have remained broadly the same over the years-Price stability; sound financial system, balance of payments viability and economic growth and development. Traditionally monetary policy is seen as influencing stock market performance via three routes; namely the interest rate channel, the money supply and the credit channel.

For many countries, the objectives of monetary policy are explicitly stated in the laws establishing the central bank, while for others they are not. The objectives of monetary policy may vary from country to country but there are two main views. The first view calls for monetary policy to achieve price stability, while the second view seeks to achieve price stability and other macroeconomic objectives. The Central Bank of Nigeria, like other central banks in developing countries, achieve the monetary policy goal through the amount of money supplied (CBN, 2006).

Several factors influence the money supply, some of which are within the control of the central bank, while others are outside its control. The specific objective and the focus of monetary policy may change from time to time, depending on the level of economic development and economic fortunes of the country. The choice of instrument to use to achieve what objective would depend on these and other circumstances. These are the issues confronting monetary policy makers. Some of the Central Bank of Nigeria's monetary policy instruments is discussed below thus;

2.1.1.1 Monetary Policy and Monetary Policy Intermediate Targets

Money Supply

This is the sum of all money or monetary assets that can easily be converted to cash in an economy stock at a specific time. It is often referred to as money stock since it is measured at a

particular point in time. It is closely monitored by the monetary authorities (the Central Banks) because if the rate of increase in money supply is consistently greater than the rate of increase in total output of goods and services in the economy; there could be a general increase in the domestic prices of goods and services: a situation generally referred to as inflation (CBN, 2016).

In Nigeria, the Central Bank defines money supply as comprising narrow and broad money. Monetary policy has lived under many guises. But however, it may appear, it generally boils down to adjusting the supply of money in the economy to achieve some combination of inflation and output stabilization (Mathai, 2009).

Standard Measurements of Money Supply

According to the IMF's manual, money supply is measured as the combined deposit liabilities of the banking system and the currency liabilities of the central bank, both held by households, firms, nonprofit institutions and all public-sector entities outside of the central government. In this official or standard representation of money supply, there are three monetary aggregates delineated; M0, M1 and M2.

M0: this includes only currency in the hands of the public, banks' statutory reserve deposits held at the central bank and banks' cash reserves. This aggregate represents the monetary liabilities of the central bank and is usually referred to as the monetary base or reserve money.

M1: The second aggregate M1, comprises currency held outside the banking system and the current account deposit liabilities of commercial banks held for transaction purposes. It may also include some foreign currency deposits that are used for domestic transactions. This definition implies that only assets that are directly used in making payments should be considered as money. It should be noted that although most current account deposits do not attract interest, they provide a convenient and safe alternative to cash as a means of payment.

M2: The aggregation of money supply seeks to broaden the range of liquid assets to include some interest earning items, such as savings deposits and *time deposits*. This broad monetary aggregate, M2, comprises M1 plus short-term (usually a year and under) savings and time deposits, certificates of deposit, foreign currency transferable deposits and *repurchase* agreements (Havrilesky & Boorman, 1982). Although some of these assets are not readily accepted as payment for goods and services, the transaction cost associated with their conversion is relatively small. For example, with the introduction of automated banking machines, holders of savings account no longer have to go directly to the bank to make withdrawals thus the burden of converting savings balances to cash is minimized. As such, savings accounts are now used in a similar manner as current accounts in many societies, thereby enhancing depositors' capacity and convenience in undertaking expenditure. With respect to time deposits, since these deposits can be withdrawn on short notice, they also provide some degree of liquidity to depositors. It should also be noted that there is an interest penalty associated with the pre-mature closure of these accounts (Bank of Jamaica, 1999). However, as long as the benefit of breaking these arrangements outweighs the cost, they do represent an alternative to cash and current accounts.

In some countries, broad aggregation of money has been extended beyond M2 to include some less liquid financial assets. These aggregates add to M2, long-term foreign- currency time deposits, travelers' cheques, short-term bank notes and money market *mutual funds*. Although these instruments are primarily used to promote long-term savings, they can be easily converted into currency or demand deposits at little cost. As such, they are said to facilitate the exchange of goods and services among individuals.

Deposit Money Banks Total Credit (Banks Credit) (Intermediate target)

Bank credit is the total borrowing capacity banks provide borrowers. It allows borrowers to buy goods or services. It is also the aggregate amount of credit available to a person or business from a banking institution. It is the total amount of funds financial institutions provide to an individual or business. In the money market, commercial banks render financial services in term of intermediation. This involves channeling funds from the surplus spending to the deficit spending units of the economy, therefore, transforming bank total deposits into total credits. Deposit money bank total credit has been recognized as an essential tool for promoting economic growth and stock market performance in the economies of the world (Bakare, Akano & Kazeem, 2015).

The use of legal reserve requirements provide monetary authorities with considerable leverage over the quantity of funds that banks may maintain and give out, just as open market sales reduces the real quantity of total deposits banks can issue. This in turn induces banks to contract or expand lending which ultimately constrain or increase the spending capacity of borrowers. In addition to affecting short term interest rates, monetary policy affects aggregate demand by affecting the availability or terms of new credit (CBN, 2015).

Consumer Price Index (Inflation rate)

Different price indices are used to measure inflation. A price index is a measure of the Aggregate price level relative to a selected base year. CPI is a principal measure of price fluctuations at retail level and it shows the cost of purchasing a representative unchanged basket of goods and services consumed by private households (Subhani, Osman, & Gul, 2010).

The Consumer Price Index (CPI) is the benchmark inflation guide for an economy. It uses a "basket of goods" approach that aims to compare a consistent base of products from year to year,

focusing on products that are bought and used by consumers on a daily basis. The Consumer Price Index is also a monthly measurement of economic prices for most household goods and services. It reports inflation (rising prices) and deflation (falling prices). The CPI measures inflation, one of the greatest threats to a healthy economy.

Traders typically use the CPI to evaluate the level of inflation in consumer goods. And changes in the level of the CPI have become an important determinant of the value of the domestic currency to other currencies.

The index reflects the expenditures of professionals, the poor, retired people, clerical workers and wage earners living in urban areas. Nevertheless, the index omits the spending information of people living in rural areas, farm operating families, those serving in the Armed Forces, and people living in institutions, such as those among the prison population and inmates at psychiatric facilities.

Therefore, the Federal government uses CPI for the following functions;

1. To determine whether economic policies need to be modified to prevent inflation.
2. Government agencies use the CPI to adjust prices in other government economic indicators, such as gross domestic product.
3. The government uses it to improve benefit levels for recipients of Social Security and other government programs.

The Headline CPI Number

The following goods and services are covered by the calculation the Bureau of Statistics uses to compute the headline CPI number:

- *Food and Beverages* – these include milk, coffee, breakfast cereals, chicken, wine, snacks and full service meals.

- *Housing* – primary residence rentals, mortgages or owner's equivalent rental, bedroom furniture and fuel oil.
- *Apparel* – clothing items, the prices of which tend to be quite seasonal.
- *Transportation* – this includes gasoline, new vehicles, airline fares and vehicle insurance.
- *Medical Care* – physician services, prescription drugs and other medical supplies, eye care and hospital services.
- *Education and Communication* – telephone services, college tuition, postage, computer software and other computer accessories
- *Recreation* – pets and pet products, televisions, sports equipment and entertainment admission fees.
- *Other* – personal services such as beauty care, financial services, funeral expenses, and tobacco and smoking products.

The Core CPI Number

In addition to the headline CPI number, the Core CPI number, which is released simultaneously with the headline CPI result represents the change of prices in goods and services purchased by consumers with the exception of energy and food costs.

Due to the fact that food and energy costs make up more than a quarter of the CPI, and these prices tend to show a higher volatility level, in many cases their fluctuations will distorting the underlying trend in inflation.

For this reason, many economists, Forex traders tend to pay more attention to the Core CPI number than the regular headline Consumer Price Index widely reported by news agencies (Raining, 2018).

Exchange Rate

The foreign exchange rate is one of the intermediate policy variables through which monetary policy is transmitted to the larger economy through its impact on the value of domestic currency, domestic inflation (the pass-through effect), the external sector, macroeconomic credibility, capital flows, and financial stability. Foreign exchange rate is the rate at which one currency will be exchanged for another. It is also regarded as the value of one country's currency in relation to another currency. Thus, changes in the foreign exchange rate might induce changes in the relative prices of goods and services, and the level of spending by individuals and firms, especially if significant levels of their wealth are held in foreign currencies. Foreign exchange is the exchange of one currency for another by governments, businesses and residents in two different countries. An appreciation in the value of the foreign exchange rate rise makes imported goods and services relatively cheap, while depreciation makes exports become cheaper to foreign buyers, thereby inducing higher competition in export markets at home. On the other hand, with depreciation, imports become more expensive and so less competitive against goods produced by domestic producers. Changes in the foreign exchange rate therefore, have implications for individual spending and investments behavior of firms, all of which can affect aggregate demand (an important determinant of economic growth, price stability and full employment in the macro economy) (CBN, 2015).

In Nigeria, over the years, the monetary authority has put in place various foreign exchange rate regimes to achieve a sound financial system. The foreign exchange rate policy applied at any time depends on the prevailing conditions in the economy. The foreign exchange rate of the Nigerian domestic currency remained at par with the pound sterling up to 1973 when it was changed to Naira. Subsequently, exchange rates were fixed to the US Dollar and the

Pound Sterling. The import-weighted basket approach was introduced in 1978, where the currencies of seven major trading partners were designated with different trade weights.

In 1985 US Dollar was adopted as the intervention currency in which Nigerian Naira was tied with US Dollar. The introduction of Structural Adjustment Programme (SAP) in 1986 with flexible foreign exchange rate regime and later improved to full deregulated system has marked the turning point in Nigeria‘s foreign exchange rate management. The movement from fixed to flexible foreign exchange rate was aimed at remedying the fast depreciation of the Naira at the parallel market and achieving external competitiveness. The floating foreign exchange rate regime which was initialized with dual foreign exchange rate system later metamorphosed fully to deregulated system.

Foreign exchange rate stability and continuous growth in capital market are required for financial system stability and monetary policy effectiveness. The financial system in Nigeria from 2005 to date has improved significantly moving from fragmented to relative efficient system. However, the expected linkages among the macroeconomic variables are found to be weak. The rates at Dutch Auction System (DAS), 2002 and Second-tier Foreign Exchange Market (SFEM) in 1986 where merged. Thus, the foreign exchange rate experienced sharp depreciation which resulted in the introduction of dual foreign exchange rate system in 1995, to check the issue and achieve efficient allocation and utilization of foreign exchange resources. The abolishing of dual foreign exchange rate system has paved way for the introduction of Inter-Bank Foreign Exchange Market (IFEM) 1999-2002.

Foreign exchange rate regime moved from regulated to de-regulated and then to guided de-regulation. From 2006 to 2011 the policy was quite flexible moving from Retail Dutch Auction System (RDAS) to Wholesale Dutch Auction System (WDAS). Thus, during the period

of the global financial crisis the autonomous inflow of foreign exchange declined and also accretion to reserves reduced drastically, CBN became the only source of funding the foreign exchange market which was characterized by very high demand. The monetary authority was pushed to a tight corner and had the option to either intervene in the foreign market and deplete the reserve, or allow the mysterious market forces to do the adjustment.

Since the reform in 1986, the naira foreign exchange rate has been highly unstable. A huge real depreciation was recorded which resulted in a realistic value of the Naira. For instance, between 1986 and 2011 the naira had depreciated by 98.68 per cent (CBN Annual Report for 2012).

In South Africa, the currency volatility was identified by the South African authorities as one of the constraints on growth in Accelerated and Shared Growth Initiative for South Africa (ASGISA) in 2006 (OECD, 2010). The sources of rand instability or volatility are exogenous. In effect, fundamental shifts in the dynamics of the global capital market, together with marginally high domestic interest rates, lead to sustained strength and volatility of the currency (Hale & Hale, 2011). The instability or volatility of the rand has, also, been caused by large fluctuations in financial flows and this has made the achievement of the stability of the rand to be nearly impossible. Since the adoption of a floating foreign exchange rate regime together with the inflation-targeting monetary policy framework, substantial swings have occurred in the foreign exchange rate of the rand. From the year 2000 when the inflation targeting-flexible exchange regime was adopted, the rand has undergone an era of excessive volatility.

2.1.2 Monetary Policy and Market Capitalization

Monetary policy is defined as a measure designed by which a central bank in a country influences the availability and cost of money. The objective is to attain certain macroeconomic objectives, which are geared towards the growth and stability of the economy. It could also be seen as a deliberate attempt to control money supply and credit conditions for the purpose of achieving certain broad economic objectives (CBN, 2016). The development of the capital market in relation to the rule it is expected to play in facilitating economic growth and development depends on some factors. These factors are seen as the key indicator of the capital market development. Prominent among these indicators is the market capitalization.

In addition to the total amount of new issues of securities raised in a capital market which is an indicator of how popular the capital market is as a source of growth funds, market capitalization which is the total value of all equity securities listed on the stock exchange is the most important indicator of capital market development among others (Sukcharoensin & Sukcharoensin, 2013). Market capitalization depends on the prevailing market price of quoted equities and the size of their issued and paid up capital. The total amount of new issues of securities raised in a capital market and the market capitalization depends to a large extend on the degree of investors' confidence in the market and the comparative cost of raising similar funds, from alternative source in the financial system. The market capitalization of a market is determined by factors such as the increase or decrease in the price of securities in the market over time (Investopedia, 2017). This however depends on investor's perception of the value of the securities on offer, the investor's disposable income and willingness to trade in securities in the market over time. As such, if investors perceive stocks to be attractive investments and they

have money to spend while they are disposed to invest in the many stocks in the market, then the market capitalization will rise and the capital market will grow and even develop over time.

Nevertheless, the goals of monetary policies are always align with macroeconomic goals in a country. However, central banks do not have a direct control over these goals; they choose monetary policy targets which they use to influence stock market performance.

2.1.3 Lending Rate and Stock Market Performance

The stock market reflects the overall health of the economy. One measure of that health is rising or falling lending rates. The Central Banks raises or lowers interest rates to fight inflation or make it easier for companies to borrow money. Most financial lending institutions follow the Central Bank's monetary policy direction. All of this up-and-down adjustment affects the stock market performance.

Lending rate can be defined as the price of money. In other words, it is the price for loanable funds and the cost we receive for borrowing in less liquid forms.

The lending rate is also used as an instrument in monetary policy.

Kunt as cited in Ali (2014) found that countries with lesser lending rate have strong stock market as compared to countries which have higher lending rate. They also mentioned that developed countries are usually having low lending rates due which their stock market performance is extra-ordinary.

It is more uncertain for a country’s stock market to have a high lending rate. It has also been found that on the outcome of lending rate; when it is raised, the general effect is a decrease of the amount of money in spread, which helps to keep inflation near to the ground. It also makes borrowing money more difficult, which affects the investment conditions of that country.

There are two major economic functions of lending rate:

(1) Lending rates affect the level of domestic output as the monetary authorities deliberately vary them by changing the money supply. Low lending rates encourage investment, and this tends to expand the economy. High lending rates discourage investment and this tends to restrain inflation or contract the economy.

(2) Lending rates allocate capital to its most productive uses. When lending rates are, say, at 10 percent, a project that expects to earn 8 percent after the payment of all costs will not be undertaken, because the cost of the borrowed money is greater than the return expected on it.

2.1.3.1 Monetary Policy and Stock Market Indicators

Monetary policy is referred to as either being an expansionary policy, or a contractionary policy. An expansionary policy increases the total supply of money in the economy rapidly or decreases the interest rate. When the central bank wants to carry out an expansionary monetary policy, it goes to the security market to buy government bonds with money, thus increasing the money stock or the money in circulation in the economy. Expansionary policy is traditionally used to combat unemployment in a recession. A contractionary policy on the other hand decreases the total money supply or increases it only slowly, or raises the interest rate. When the central bank wants to implement a contractionary monetary policy, it goes to the security market to sell government bonds for money thus decreasing the money stock or the money in circulation in the economy.

Contractionary policy is used to combat inflation. Furthermore, monetary policies are described as follows: Accommodative, if the interest rate set by the central monetary authority is intended to create economic growth; Neutral, if it is intended neither to create growth nor combat inflation; or tight if it is intended to reduce inflation. From the above concept, it becomes

expedient to give an explanation of stock markets' behaviour and their reaction to monetary policy.

Stock market is an institution through which company shares and government stocks are traded. According to Anyanwu (1997), the stock exchange is a market where those who wish to buy or sell shares, stocks, government bonds, debentures, and other securities can do so only through its members. It is a capital market institution and is essentially a secondary market in that only existing securities, as opposed to new issues, could be traded on. The impact of the stock market on the macro economy comes primarily through two channels. The first, as suggested by Greenspan (1996) is that movements in stock prices influence aggregate consumption through the wealth channel. Second, stock price movements also affect the cost of financing to businesses. A number of macroeconomic and financial variables that influence stock markets have been documented in the empirical literature without a consensus on their appropriateness as regressors.

De Long and Olney (2009) asserted that ever since stock markets came into existence in the world, economists have been saddled with the arduous task of making these financial intermediaries work efficiently and effectively. This is because stock prices are among the most closely watched asset prices in the economy and are viewed as being highly sensitive to monetary policy and other economic conditions. The level of the stock market is a key variable which indicates the pulse of monetary policy and the overall economic activity in a country and together with other variables such as the real Gross Domestic Product, the unemployment rate, the inflation rate, the interest rate and the foreign exchange rate give a summary of the macro economy. Stock prices have also been known to swing rather widely, leading to concerns about

possible "bubbles" or other deviations of stock prices from fundamental values that may have adverse implications for the economy.

Durban (2000) claimed that many financial crises in the past have been traced to a crash in the stock markets and one of the consequences of financial crises are decline in the level of the stock markets. In fact, stock markets are so important in any economy that the level of the stock markets is the key economic indicator which is heard about most often. Stock market indicators such as market capitalization, all-shares index, value and volume of stocks traded in the stock exchange are announced on the news daily. This shows the great importance of the stock markets to any economy in the world. Many African countries are still classified as underdeveloped in economic journals and publications of the IMF and the World Bank because their stock markets are still in their infancy stage.

Monetary policy actions have their most direct and immediate effects on the broader financial markets, including the stock market. As Bernanke and Kuttner (2005) point out, some observers view the stock market as an independent source of macroeconomic volatility to which policymakers may wish to respond. Monetary policy shifts significantly affect stock market performance, thereby supporting the notion of monetary policy transmission via the stock market. As Blinder (1998) notes, “monetary policy has important macroeconomic effects only to the extent that it moves financial market prices that really matter like long-term interest rates, stock market values, and exchange rates.” Economists such as Cassola and Morana (2004) have observed that monetary policy decisions generally exert an immediate and significant influence on stock market indices and volatilities in both European and US markets.

2.1.4 Overview of the Performance of Monetary Policy in Nigeria

The short coming of direct instrument of monetary policy is well known and documented and need to be emphasized again. Despite the progressive deregulation of the financial sector and the commencement of transition to market based instrument of monetary management, the conduct of the effective monetary policy in Nigeria has been constrained by a number of factor particularly the absence of fiscal discipline until 1995. The lack of instrument autonomy for the Central Bank frequent policy changes and reversal and widespread distress in the financial sector have constrained the effectiveness of monetary policy in the post SAP period. From the inception of Structural Adjustment Programme (SAP), the thirst for monetary policy in Nigeria has largely been restrictive and aimed at containing demand pressure on domestic prices and foreign exchange market among other stabilization objectives. Consequently, the shift to market based approach refer to have potential to enhance effectiveness in addressing the real cause of monetary instability and financial distress. Also, growth target for monetary and credit aggregates were exceeded by substantial margin resulting in the acceleration of inflation rate to double digit and increased pressure on exchange rate. Equally, there is virtually no effect in self-regulation. The level of liquidity outside the commercial bank system is yet another factor hindering the effectiveness of monetary policy. Apart from volume of the monetary authorities do not have a measure of that liquidity. Thus, it is impossible to target such substantial liquidity with monetary policy and because of aggregate economy is impaired. It involves five main elements;

(i) The public announcement to medium term target for inflation.

(ii) The institutional commitment to price stability as the primary goal of monetary policy to which other goals are subordinates.

(iii) Information exclusive strategy in which many variables and monetary aggregates in the foreign exchange rate used for deciding the setting of policy instrument.

(iv) Increase transparency of policy strategy through communication with the public and the market about the plans, objectives, and decisions of the monetary authorities.

(v) Increase transparency and accountability of the Central Bank for attaining its inflation objectives. The commercial banks are the main operators of the monetary policies with the CBN being the monetary authority. The aim of the monetary policies are basically to control inflation, maintain healthy balance of payment position for the country in order to safeguard the external value of the national currency and promote adequate and sustainable level of economic growth and development. The commercial banks play a crucial role in the implementation of monetary policies while the monetary policy is aimed to achieving some macro-economic objectives. A countercyclical monetary expansion may raise output and help to bring down the level of unemployment in the short run but may aggregate the problem of inflation in extremely high extent, it will overshadow the benefit of increase in output and employment level, the level of feedback effect to the commercial banks would go below savings by customers. Direct monetary control techniques, which have been in vogue in the 60s and 70s, were restrained up to June 1986. The instrument had significant influence on the Nigerian economy. Thus, during the 80s, the permissible aggregate credit expansion ceiling was on the downward trend reflecting the policy of restraining the growth in the liquidity of the banking system. The direct monetary control was not used only to control overall credit expansion but also to determine;

(i) The proportion of bank loans.

(ii) Merchant bank asset portfolio.

(iii) Proportion of bank loans to small-scale indigenous enterprises.

(iv) Proportion of bank loans to indigenous borrowers.

(v) Proportion of rural deposit granted as loan to rural dwellers.

(vi) Categories of banks exempted from credit ceiling.

(vii) Cash deposit for imports.

(viii) Lid on interest rate etc.

The above justified the claim that the financial sector particularly the banking subsector in the most regulated sector of the economy. According to research, it is a sector whose players are literally told not only what business to do, how much to charge for its products and services, how to distribute its profit. The implication of this is that commercial banks in the performance of their role as financial intermediaries especially during this period have a little control over the utilization of their funds. With the introduction of indirect monetary control, Nigerian economy witnessed mopping up excess liquidity in the same way through the issuance of stabilization securities, since October 1990 (though suspended since March 1993) and increase in commercial bank cash reserve ratio in 1989 and 1990. The ability of bank to grant credit was further reduced by raising the maximum liquidity ratio for commercial banks from 25 per cent to 30 per cent in 1987 and this was retained up to 1999. The experience of monetary policy in Nigeria originated from the CBN Act of 1958 and its subsequent amendment form the act of the bank drew inspiration as to what should constitute its short and long term monetary policy objectives, the short to medium term objectives compliment the Federal Government budget objectives. The CBN Act of 1958 stated the objectives of the bank as being;

(i) Issuance of legal tender currency in Nigeria.

(ii) Maintaining external reserves to safeguard the international values of the legal tender currency.

(iii) Promoting monetary stability and a sound financial system in Nigeria and;

(iv) Acting as banker and financial adviser to the government.

Over the years, the principal objectives have metamorphosed into maintaining a single digit inflation rate, maintaining foreign exchange rate stability, promoting sound financial system, high level of output growth and employment generation and enhancing the overall efficiencies of the economy. The present agitation for the deregulation of petroleum sector will stem up the price of goods and services in the market by over 100 per cent. Survey has shown that there has been a significant price increase in the market owing to the minimum wage demand by the labor unions and this price increase had doubled. Also the partial removal of the subsidy on petroleum products had again created another price increase. In the heydays of the oil boom, the naira in relation to the U.S dollars averaged about 50.65%. Federal government satisfied all conditions for an IMF loan except the call for devaluation of the naira. In pursuance of the monetary policy objectives, the CBN over the years employed direct and indirect policy measures and instruments. The direct measures includes the imposition of ceilings on interest rate and credit expansion on banks, enforcement of sectional allocation of credit expansion, administratively determination of the level of structures of interest rates and other quantitative control measures. The indirect measures include required cash ratio, market based interest rate policy, minimum rediscount rate, liquidity rate, open market operation and moral suasion. The direct monetary control era lasted through 1992. However, since 1993, the CBN has shifted market based instrument in line with the global trend towards a market based framework for monetary control (CBN, 2002).

Monetary policy instruments used under indirect control regime have evolved over the years with the monetary authority time-turning more than as dictated by trends in the economy especially the overall money aggregates, such major instruments are;

(a) Open Market Operation (OMO):- It refers to the purchase, sale of government securities (Nigeria Treasury Bill NTB) including the CBN for the purpose of increasing or reducing the money supply. Open Market Operation expands monetary base, thereby raising the money supply and bowering shorter, interest rates. In 2002, the CBN introduced another monetary instrument known as the CBN certificate to compliment the use of government security for conduction open market operation (CBN, 2002). The CBN certificate is different from other instrument in the sense that, it cannot be discounted for this is to enhance the efficiency of monetary policy actions, given the instability of the only available treasury. In terms of impact, the sales and purchase of CBN certificate has the same impact as the sales and purchase of other government securities. The last trenched of the Central Bank of Nigeria certificate matured in August 2002 and has since then extinguished CBN plans as currently underway to introduce a new short term instrument called "CBN-OMO" bill to compliment the NTBs in CBN's portfolio for OMO especially for liquidity management. The OMO bill have maturity period of 30 to 60 days to be issued on the basis of need based on the Dutch auction system and targeted at the authorized deals only (CBN 2002). Equally, Open Market Operation (OMO) will be conducted weekly in the secondary market, mainly in short term government securities of carrying maturities, or in order to meet the various preferences of participant in the market. OMO will be complimented by reserve requirements and discount window operation including Re-purchase Agreement (REPOS) while discount houses will continue to play the role of principal dealer in the market (CBN guideline 2002/2003).

(b) Discount (Rediscount) policy:- It refers to the condition under which and how much the CBN lends to commercial banks in forming its rate as a lender of last resort. It primarily involve changes in the discount rate (for minimum rediscount rate MRR) and affects the volume of loans to the banks, and to monetary base and expand the money supply, a fall in discount rate reduces the monetary base and shrinks the money supply. The CBN facility at which discount loans or discounts are made to banks is called the "Discount Window". The MRR is also used to influence the level and direction of other rates determines whether the commercial bank is adopting a policy of monetary ease or monetary restraint.

(c) Reserve Requirement:- Cash and liquid assets are the requirement imposed by the CBN that commercial banks must hold at a certain amount of reserves. It is the minimum amount of reserve (or eligible liquid asset) that commercial banks must hold in proportion to total deposit liabilities. For each category of the deposit liabilities, a rise in the cash ratio or liquidity ratio reduces the amount of deposit that can be supported by a given level of monetary base and will lead to contraction of the money supply. Conversely, a fall in the ratio leads to an expansion of the money supply because more multiple deposit creation can take place. The reserve required is currently by the CBN fixed at 12.5 percent for cash reserve ratio. However for those in the bank that shows evidence that 20 percent outstanding loan is to real sector, the cash reserve ratio has been reduced.

(d) CBN-certificate:- This was issued for the liquidity first time in year 2001 to mop up the excess liquidity generated by the rapid monetization of the windfall going from the crude oil receipts. It will be issued as the need arises to compliment traditional monetary policy tool to contain growth in liquidity to desired level (CBN Guideline 2002).

(e) National Saving Certificate:- This is medium for long term securities intended to broaden and offer alternative investment options for both banks and the public. It is used to supplement effort at managing on a more sustainable basis, the persistence excess liquidity on the economy while facilitating saving and investment growth.

(f) Federal Government Development Stock:- This is meant to encourage the government to source its long term financing needs from the capital market. This will also change the direction of bank credit fair in favor of the private sector. The instrument was suspended in 1980s and efforts are not being made to resume its floatation.

(g) Moral Suasion:- This involves subtle appeals to banks through bank committee and other communication channels to briefly correct compel and give guideline. The use of moral suasion has not off course been confirmed to CBN alone. Nearly every government functioning has used the opportunity of their public address to urge banks to pursue one type of policy or the other. From the above explained instruments, it is pertinent to know that three out of these instruments are currently as a monetary policy tools in Nigeria. They have been reviewed and compressed with the other stated tools above, the three tools are;

(i) Open Market Operation (OMO).

(ii) Discount (Rediscount) policy and;

(iii) Reserve Requirement

2.1.5 Framework of Monetary Policy in Targeting Inflation in Nigeria

Nigeria monetary policy is enhanced to target the reduction in the rate of inflation with the framework of maintaining price stability as a single most important objective of monetary policy. This monetary policy framework directed towards the reducing inflation presupposes the existence of a stable and predictable relationship between monetary aggregates and other

economic variable in the economy. The monetary framework as operated by the CBN entails certain target growth path for one or more definition of money stock for year or over a million terms prior to fiscal year 2002, the CBN has shifted to a medium term 2002, the CBN has shifted to a medium term perspective which implies that chosen monetary aggregate may not necessarily be achieved within one year. Under this framework, the CBN shrines to maintain equilibrium in the financial assets like bonds do not diverge significantly to induce upward or downward pressure on interest rate and price. Thus, the bank used the instrument at its disposal to ensure that the demand for and supply of financial assets including money are consistent with the desire of the public to hold them and willingness of suppliers to supply them. The framework is based on the quality theory of money and the money supply process. Monetary target is predicted on the empirical evidence that inflation is basically a monetary phenomenon and therefore, the monetary authorities must control the supply in other to control inflation. The quantity theory of money is mathematically stated as;

MV=PQ

Where M=money supply

V=velocity of monetary circulation

P=price level

Q=Real Aggregate Output (Income). The link between the total quantity of money in circulation and the total spending in final goods and service produced in the economy, the rate of turnover of MV that is, the average number of times per year that a unit of the naira is spent on buying the total amount of goods and services produced in the economy. Inflation targeting in recent monetary policy strategy whose basic idea is that the Central Bank adopts or assigns explicit numeric target range from inflation to making achievements of this target its primary objective.

It is important to bear in mind that this does not mean the Central Bank ignores unemployment or the rate of economic growth. It simply means that as long as inflation remains within the stated range, the Central Bank is free (and indeed expected) to stabilize the economy. However, the basic doctrine of inflation targeting is the price stability, accountability, and discipline on the part of the Central Bank and the government itself.

2.1.6 Stock Market Performance

According to World Bank (2007), stock market is a market where buyers and sellers engage in trade of financial securities like bonds, stocks etc and undertaken by participants such as individuals and institutions. The market channels surplus funds from savers to institutions (deficit areas) which then invest them into productive use. This market provides long term finance for real sector developments (Desai, Foley & Hines, 2006). The primary function of stock markets is to serve as a mechanism for transforming savings into financing for the real sector. El-Wassal (2013) noted that stock markets can accelerate economic growth by mobilizing and boosting domestic savings and improving the quantity and quality of investment. Better savings mobilization may increase the rate of saving and if stock markets allocate savings to investment projects yielding higher returns, the increasing rate of return to savers will make savings more attractive. Consequently, more savings will be channeled into the corporate sector. Efficient stock markets make corporations compete on an equal basis for funds and help make investment more efficient.

2.1.6.1 Stock Market Performance Measurement Variables

Stock market development may be captured using the following indicators: i) stock market size; ii) stock market liquidity; iii) stock market volatility; iv) stock market concentration; and v) stock market linkage to real sector performance (World Bank, 2015; El-Wassal, 2013;

Levine & Zervos, 1998). The adoption of a variety of indicators could provide a more accurate depiction of stock market performance. For the purpose of our study, we will be looking at the stock market size and itemize its sub-variables as follows;

Stock Market Size

There are two main indicators of stock market size: market capitalization and the number of listed companies.

a) Market Capitalization – this refers to the total dollar market value of the stock exchange outstanding shares traded. This measures the total value of listed shares. Olson (2005) defines market capitalization as the price of a stock at any given time multiplied by the amount of shares outstanding. From a market perspective, market capitalization comprises the sum of individual outstanding shares by their prices for all the companies listed in a given stock market.

b) The Number of Listed Shares - The number of listed shares is used as a complementary measure of stock market size. The main importance of this measure is that it is a proxy for the breadth of the stock market and is not subject to stock market fluctuations (Bekaert et al, 2004 and Rajan & Zingales, 2003). Moreover, it is not tainted by possible mis-measurement of GDP, which often happens in many developing countries.

c) The All Share Index – This is a series of numbers which shows the changing average value of the share prices of all companies in a stock exchange, and which is used as a measure of how well a market is performing. An index is a calculated average of selected share prices, representing a particular market or sector. It is a basket of shares that provides a broad sample of an industry, sector or economy. The collective performance of these shares gives a good indication of trends in the overall market they represent. It enables investors to track

changes in the value of a general stock market, indices also provides a useful benchmark to measure the success of investment vehicles such as mutual funds, savings and foreign direct investments.

However, the study narrowed its stock market performance to market capitalization for the three countries in the selected African economies.

2.1.7 The Nigerian Stock Exchange

The NSE, a registered company limited by guarantee, was founded in 1960 and it is licensed under the Investments and Securities Act (ISA) and is regulated by the Securities and Exchange Commission (SEC) of Nigeria. The Exchange offers listing and trading services, licensing services, market data solutions, ancillary technology services and more.

The Nigerian Stock Exchange started operation on 5th June 1961 as the Lagos Stock Exchange (LSE). The LSE was reorganized and renamed the Nigerian Stock Exchange in 1977 following the Okigbo Financial Review Committee's recommendation in 1976. The NSE has a head office in Lagos and nine (9) functional trading floors. In recent years, the Nigerian Stock Exchange recorded growth in market capitalization, membership, value and volume traded. By December 2007, the All Share Index has reached over 57,990.2 from 1113.4 in January 1993. The NSE is the second largest financial Center in sub-Saharan Africa. As of December 31, 2012, it had about 198 listed companies with a total market capitalization of about N8.9 trillion ($57 billion). The capitalization of listed equities grew by 37.31% from N6.54 to N8.98 trillion ($57.77 billion); the NSE All Share Index (ASI) gained 35.45%; and average daily turnover for equities was N2.65 billion ($17.05 million), up 2.71%. By convention, the size of a country's stock market is assessed by its capitalization relative to GDP (Nnanna et al., 2004). The size of NSE increased from 6.9% in 1993 to 28.1 in 2006; liquidity also increased from 0.7% to 7.8% in

the same period. As at March 7, 2017, it has 176 listed companies with a total market capitalization of about N8.5 trillion. All listings are included in the Nigerian Stock Exchange All Shares index. In terms of market capitalization, the Nigerian Stock Exchange is the third largest stock exchange in Africa. On July 7, 2017, the Nigerian Stock Exchange suspended 17 companies for failure to adhere to regulatory provisions of the law on corporate governance and extant post-listing guidelines.

The NSE is regulated by the Securities and Exchange Commission, which has the mandate of Surveillance over the exchange to forestall breaches of market rules and to deter and detect unfair manipulations and trading practices (SEC, 2011). The Exchange has an automated trading System. Data on listed companies' performances are published daily, weekly, monthly, quarterly and annually.

The Nigerian Stock Exchange has been operating an Automated Trading System (ATS) since April 27, 1999, with dealers trading through a network of computers connected to a server. The ATS has facility for remote trading and surveillance. Consequently, many of the dealing members trade online from their offices in Lagos and from all the thirteen branches across the country. The Exchange is in the process of establishing more branches for online real time trading. Trading on The Exchange starts at 9.30 a.m. every business day and closes at 2.30 p.m.

In order to encourage foreign investment into Nigeria, the government has abolished legislation preventing the flow of foreign capital into the country. This has allowed foreign brokers to enlist as dealers on the Nigerian Stock Exchange, and investors of any nationality are free to invest. Nigerian companies are also allowed multiple and cross border listings on foreign markets.

Regulation

The NSE is regulated by the Securities and Exchange Commission, which has the mandate of Surveillance over the exchange to forestall breaches of market rules and to deter and detect unfair manipulations and trading practices. The exchange has an automated trading System. Data on listed companies' performances are published daily, weekly, monthly, quarterly and annually.

Transactions on The Exchange are regulated by The Nigerian Stock Exchange, as a self-regulatory organization (SRO), and the Securities & Exchange Commission (SEC) – apex regulator, which administers the Investments & Securities Act of 2007.

2.1.8 The Nairobi Securities Exchange (NSE)

Nairobi securities exchange formally Nairobi stock exchange is the institution that is tasked with the responsibility to oversee listing, delisting and regulation of trading of financial securities such as shares (Barasa, 2014). The Nairobi Securities (stock) Exchange (NSE) was established in 1954 as the Nairobi Stock Exchange, based in Nairobi the capital of Kenya. It was a voluntary association of stockbrokers in the European community registered under the Societies Act in British Kenya.

The Nairobi Stock Exchange (NSE) has a long history that can be traced to the 1920's when it started trading in shares while Kenya was still a British colony (IFC/CBK, 1984). While share trading was initially conducted in an informal market, there was a growing desire to have a formal market that would facilitate access to long-term capital by private enterprises and also allow commencement of floating of local registered Government loans. The NSE was constituted in 1954 as a voluntary association of stockbrokers registered under the Societies Act (NSE, 1997a). The newly established stock exchange was charged with the responsibility of developing

the stock market and regulating trading activities. The Nairobi Stock Exchange improved to automated trading in government bonds through the Automated Trading System (ATS) in November 2009 and evolves into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments. In the same year, the equity settlement cycle moved from the previous T+4 settlement cycle to the T+3 settlement cycle. This allowed investors who sell their shares, to get their money three (3) days after the sale of their shares. Despite its history, however, the stock market is yet to make significant contribution in the development process. The question of interest to research is what is the extent of monetary policy influence to the development path of the stock market? Does it mimic monetary policy framework of other developed or emerging markets?

The development path of stock markets in both the emerging and developed world indicates an evolutionary process where changes in institutional infrastructure and the policy environment are witnessed as efforts are made to facilitate the growth of the stock market. The evolutionary process indicates graduation from non-formal markets to formal organizations without a regulatory body and then establishment of a statutory body in the reform/restructuring process. The establishment of a statutory body is aimed at enhancing the confidence of investors. While statutory regulatory bodies in most developed markets are set up to resolve the conflict of interest in the self-regulation framework, most of the emerging markets are establishing such bodies as part of the revitalization reform process.

According to Singh (2014), the NSE 20-Share Index (NSE 20) is the long-standing benchmark index used for equities traded on Kenya's Nairobi Stock Exchange (NSE) and represents the geometric mean of share prices of the NSE's 20 top stocks. The NSE 20-Share Index was introduced in 1964, one year after African natives were first allowed to trade on the

NSE. It was joined in February 2006 by the NSE All Share Index (NASI), aimed at reflecting the total market value of all stocks traded on the NSE in one day rather than just the price changes of the 20 best performers captured by the NSE 20.

Stocks (2014) in Waithaka (2013) states that the members are selected based on a weighted market performance for a 12 month period as follows: Market Capitalization is 40%, shares traded are 30%, number of deals is 20% and turnover is 10%. Index is updated only at the end of the day. Companies included in the index are Mumias Sugar, Express Kenya, Reavipingo, Sasini Tea, CMC Holdings, Kenya Airways, Safaricom, Nation Media Group, Barclays bank of Kenya, Equity Bank, Kenya Commercial Bank, Standard Chartered Bank, Bamburi Cement, British American Tobacco, Kengen, Centum Investment Company, East African Breweries, EA Cables, Kenya Power and Lighting Company Limited and Athi River Mining. This index primarily focuses on price changes amongst those 20 companies.

Osoro and Ambrose (2013) notes that there have been complaints about the computation of the NSE 20 SHARE Index, the feeling has been that it is not reflective of the market performance. He adds that this is partly because the index is equally weighted. For instance, this meant that KenGen, which has a market capitalization of about Sh57 billion carries the same weight as Express Kenya, under market capitalization which is only SH814 million or a seventh of its size as at February 2008. Assigning equal weights to two companies with such a huge difference in their market capitalization is obviously unrealistic.

2.1.9 The Johannesburg Stock Exchange (JSE)

The JSE was formed in 1887 during the first South African gold rush. The Johannesburg Stock Exchange (JSE) is the oldest existing and largest Stock Exchange in Africa founded in 1887, one year after the discovery of gold on the Witwatersrand area, in response to the need for

capital to fund burgeoning investments in the mining sector. It grew rapidly. Following the first legislation covering financial markets in 1947, the JSE joined the World Federation of Exchanges in 1963 and upgraded to an electronic trading system in the early 1990s.

The Johannesburg stock exchange introduced corporate and qualified membership in 1985 via the amendment of Stock Exchange Control Act of 1985 approved by the parliament. Corporate broking membership with limited liability was introduced (supplementing sole traders, partnerships and unlimited liability corporate membership). However, member firms were to be the trading entity and not the individual. Foreign members were allowed to also operate. In 1993, the JSE became a founder member of the African Stock Exchanges Association (ASEA).

By May 1996, the Bond market was passed from the JSE to the Bond Exchange of South Africa and the latter was licensed as a financial market in terms of the Financial Markets Act.

The open outcry trading floor different from the rough of the miner's tent where the bourse started primarily in scale was closed in 1996, and replaced by an automated trading system known as the Johannesburg Equities Trading (JET) system. On June 10 of 1996, all trade conducted on the JET system. Dual trading and negotiated brokerage commissions were introduced. In 1997, the electronic clearing and settlement concept, Shares Transactions Totally Electronic (Strate) was introduced. On 18 August, real-time news service for the dissemination of company announcements and price sensitive information known as the Stock Exchange News Service (SENS) was introduced. The JSE Listings Requirements were amended to accommodate the introduction of SENS. Warrants were introduced on the JSE by Deutsche Bank. The Securities Services Act was promulgated, replacing the Stock Exchanges Control Act and the Financial Markets Control Act in 2004.

In 2013, the Financial Markets Act, No 19 of 2012, replaced the Securities Services Act, No 34 of 2004. The JSE launched its public online virtual trading game in June. Phase one of the move to T+3 was implemented in July 2013.

South Africa has mature capital markets that serve the domestic economy and the wider continent. As one of the world's 20 largest exchanges by market capitalization ($1,007bn at end-2013) and the largest exchange in Africa, the Johannesburg Stock Exchange strives to offer secure, efficient primary and secondary capital markets across a diverse range of instruments, supported by cost-effective services (JSE, 2016).

While a number of heavyweights like British American Tobacco (BAT), SABMiller, GlencoreXstrata and BHP Billiton account for a large share of the market, The Exchange caters for a diverse variety of offerings. There are almost 400 companies listed on The Exchange across the Main Board and AltX.

South African bond market

South Africa's interest rate market is the largest on the continent. The majority of South African bonds are issued government and state owned entities but the number of corporate bonds issued is growing. The JSE also offers a variety of Bond-based Derivatives, including Bond futures, Forward-rate Agreements, Vanilla Swaps and standard bond options. The Exchange hopes to attract new bond issuers to the bourse, seeking to partner with other African exchanges with a dual-issuance model. In November 2012, the Namibian government floated a R850m ($78m) 10-year bond priced at 8.26%, the first tranche of a R3bn ($275.2m) programme, and the JSE hopes to encourage other African countries to list debt on The Exchange.

Derivatives

The JSE offers trading of a variety of Derivatives, including Futures and Options on Equities, Bonds, Indices, Interest Rates, Currencies and Commodities. The JSE was ranked the 6th largest exchange by number of Single Stock Futures traded and 9th by the number of Currency Derivatives traded in 2012 in the World Federation of Exchanges Annual Derivatives Market Survey.

Membership

There are 62 equities members, 120 Equity Derivatives members, 92 Commodity Derivatives members and 102 Interest Rate and Currency Derivatives members licensed in South Africa, a mix of local and international operations.

Technology

The JSE has undertaken major technological upgrades over the past few years on a consistent drive to upgrade trading, clearing and settlement which is still continuing. In July 2013, the JSE implemented a new trading platform the Millennium Exchange in the Equity Market, while at the same time moving the trading system from London to Johannesburg. Following this successful transition, trades can now be executed up to 400 times faster than under the previous TradElect system. The change allows for increased liquidity and more algorithmic traders.

Regulation

The JSE is the frontline regulator for the exchange, setting and enforcing listing and membership requirements and trading rules. The Financial Services Board (FSB) supervises the JSE in the performance of its regulatory duties.

The regulatory landscape is set to change significantly in the future, as South Africa looks to implement a twin peaks model of oversight. Under the new system, prudential supervision will be transferred to the South African Reserve Bank (SARB) and market conduct regulation will be led by a bolstered FSB.

South Africa is currently ranked 1st in the world in terms of regulation of securities exchanges in the World Economic Forum's Global Competitiveness Survey for 2013-2014. This is an accolade for both the JSE and its regulators.

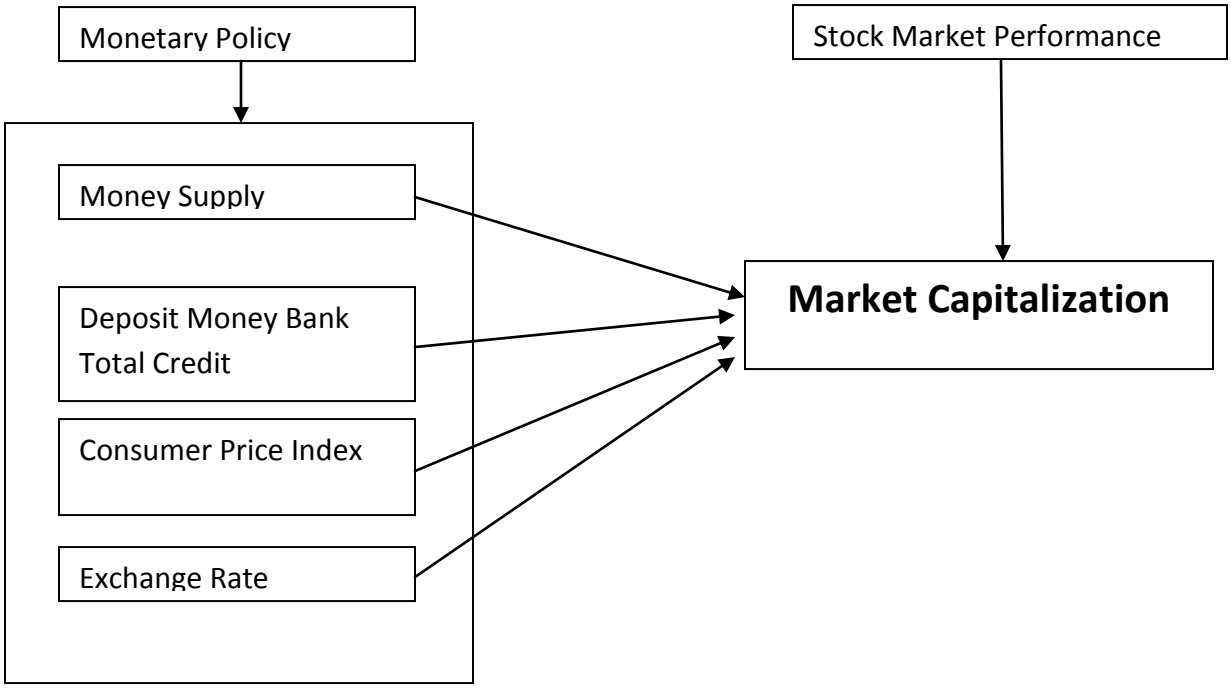
Foreign listings

Another regulatory change that could have widespread implications is the 2011 decision to alter South Africa's inward listing rules, allowing foreign domiciled companies to be treated as domestic listings. While foreign firms had been allowed to list on the JSE since 2004, they were previously subject to foreign exchange rules, which limited the amount of these equities that local investors could hold. The lifting of these restrictions has been an important regulatory shift for The Exchange and makes the JSE a more attractive listings destination (JSE, 2017).

It is consistently one of the world's twenty largest stock markets; the sixth largest among developing economies (after China, Brazil, India, Taiwan and South Korea); and by far the largest in Africa, with market capitalization in excess of 900 billion US dollars in early 2013 Markets index, the fifth largest country weight), and its aggregate value is therefore rapidly affected by the global flow of funds, to and from, emerging markets. The JSEs significance in the South African economy, measured, admittedly crudely, by the ratio of market capitalization to Gross Domestic Product, is close to 190%. This is unusually large, and only exceeded by Hong Kong, where the ratio is a staggering 914%, and Singapore, at 224%, and suggests that sustained movements in the aggregate valuation of the stock market can have significant effects

on aggregate spending and the share of consumption in domestic output. The JSE provides a market where securities can be traded freely under a regulated procedure. It does not only channel funds into the economy, but also provides investors with returns on investments in the form of dividends.

Figure 2.1: Conceptual Framework



Source: Researchers Conceptual Framework

2.2 Theoretical Framework

This section is a review of related theories on monetary policy and stock market performance. These theoretical perspectives allow us not only to clarify concepts, but also to identify recommendations in terms of policy strategy. The related theories reviewed are:

2.2.1 Friedman Quantity Theory of Money

The origin of the relationship between money supply, interest rates and stock prices point to Friedman's money demand function. Friedman (1956) attempted to integrate two distinct

decisions to be made by agents; a decision on the quantity of savings (IS) and decision on how to allocate those savings among assets in a portfolio (LM) and in so doing transformed the liquidity preference theory of the demand for money. He proposed that portfolio allocation decisions could have an impact on consumption – savings decisions determined by interest rate movements.

This model considers the interaction between equity prices, output, interest rates and money supply. One of the earliest underlining theories of monetary phenomenon on macroeconomic factors which include return on equity is in the restatement of the quantity theory by Friedman (1956). He proposed a general money demand function in the form;

$M^d = f\ (Y_p, r_b, r_e, r_m, \Pi^e)$ ……(2.1)

Where money demand is positively related to permanent income $Y_{p,}$ negatively related to expected interest rates on bonds $r_{b,}$ the expected rate of return on equity $r_{e,}$ expected market interest rate $r_{m,}$ and inflation rate Π^e.

The rate of return on bonds and equity represent the opportunity costs of holding money. The rate of return on money is the services provided by holding money as well as any interest payments on money deposits at banks. Expected inflation Π^erepresents the return on holding goods. This element is the distinctive relationship that agents hold goods as assets and substitutes them for money if they expect a price to rise that is capital gains on holding goods.

This design is directed by the flow constraint;

$(Y^d - Y^s) + \Delta V = 0$ …….. (2.2)

Where Y^d is aggregate demand and Y^s is aggregate supply and ΔV is the change in inventory holdings. On the other hand, the asset allocation decision can be viewed from Walras's Law stock constraint;

$(M^d - M^s) + (B^d - B^s) = 0$ …….…… (2.3)

where M^d and M^s is the stock level of money demand and supply and B^d and $B^s$is the stock level of bond demand and supply – refers to all alternative interest bearing financial assets which includes equities.

Considering a state of full equilibrium, if there is an increase in money supply M^s, the left hand equation will be negative, which is a situation of excess money supply, which will make the term on the right to be positive for excess bond demand. Hence the price of bonds or equity will increase and necessarily interest rate will fall – bringing the equity market into equilibrium, and by Walras' Law, the money market as well will be in equilibrium.

A generalized portfolio constraint can be stated by relating the money demand to conditions in the goods market to create a direct channel of aggregate demand to output.

$(M^d - M^s) + (B^d - B^s) + (Y^d - Y^s) = 0$. ……... (2.4)

In an expansionary monetary policy, M^s will increase hence the money market that is the term on the left will be negative. In any case because of the goods market there may not necessarily be an excess demand for bonds, since the disequilibrium in the money market can be offset by an excess demand for goods i.e. $M^d - M^s < 0$, $B^d - B^s = 0$, and $Y^d - Y^s > 0$. By the Keynesian multiplier, as there is excess aggregate demand, then output Y^s will rise and money demand M^d will rise so that the goods market and money market are brought into equilibrium. Therefore Friedman's proposition is that an increase in money supply does not necessarily imply an excess demand for equity or bonds but may be offset by an increase in the demand for durable household goods such as a house or an automobile. This proposition is one that we wish to prove or rebut in this study, to know whether changes in money supply actually leads to proportionate changes in stock prices or otherwise.

2.2.2 Tobin's (1969) General Equilibrium Approach to Monetary Theory and Stock Market

Tobin (1969) emphasized stock returns as an important link between the real and financial sides of the economy. In that model, Tobin depicted how stock returns may respond to changes in the monetary and fiscal policy variables of the model.

The effect of monetary policy on stock market returns is analyzed from two main channels, namely through the money supply or the interest rate (prime rate). A change in the money supply for example may lead to changes in market interest rates which would trigger a portfolio readjustment by investors. This may be explained by the fact that, changes in the market interest rate affects the value of wealth – the sum discounted future cash flows (and /or dividends) – thereby compelling investors to revalue their equity holdings.

Tobin (1969) asserted that stock returns serves as a linkage between the real and the financial sectors of the economy and depicted how both budget deficits and money growth could have important effects on stock returns. At the theoretical level, fiscal policy actions such as changes in government expenditure or taxes (resulting in budget deficits or surpluses) are important determinant of asset prices. For instance, increases in taxes with government expenditure unchanged would lower asset returns (or prices) due to the fact that such a policy action may discourage investors from further investing in the stock market (Laopodis, 2006).

Moreover, government fiscal policy in relation to capital gains tax has some implication for the stock market. Investors will only pay capital gains taxes as they offload their shares to other prospective investors. Thus, high capital gain taxes may discourage investors from actively trading their shares which may dampen the liquidity of the stock market.

Besides increases in government borrowing would lead to a rise in the short-term interest rates, which in turn lower the discounted cash flow value from an asset. This may culminate in a decline in stock market activity due to lower expected returns. However, with respect to high interest rate, which threatens to crowd out the private sector culminating in a decline in investment and economic activity, the central bank may take action by increasing the money supply.

The Tobin (1969) asserted that stock returns serves as a linkage between the real and the financial sectors of the economy and depicted how both budget deficits and money growth could have important effects on stock returns. Since, the stock market performance indicator for our study is market capitalization and its reaction from monetary policy changes; the study therefore adopts the Tobin's theory of general equilibrium from all the theories discussed above. The Tobin's (1969) theory of general equilibrium applies in developing economies context. This is as a result of the fact that stock market performance responds to changes in monetary policy and monetary policy has the potential to influence the financial sector, particularly the capital market, therefore Tobin's theory is adopted as the theoretical framework for this study.

2.3 Empirical Review

Monetary policy is one of key drivers of stock market performance through its impact on economic variables. Folawewo and Osinubi (2006) defined monetary policy as a combination of measures considered to regulate the value, supply and cost of money in an economy, in consonance with the expected level of economic activity; whereas, stock market in developing countries plays an important role in achieving development. On this note, Galbraith (1955), cited in Shivangi and Naresh (2012) described the stock market as a mirror, which provides an image of the fundamental economic situation. This has attracted scholarly attention in the academic

frontier. The empirical reviews were arranged in objective by objective to capture the robustness of the empirical work in the study.

2.3.1 Money Supply and Stock Market Performance

Money supply is a key factor in stock market performance and various studies have singled out money supply as a monetary policy instrument on stock market indexes in the literature.

Lithman (2012) examine money supply and stock prices. Specifically it inquires what macroeconomic factors influence the stock market index. Given the high degree of equity correlation in the market, variables previously used for explaining the cross-section of expected returns are tested against the S&P500 index. The macroeconomic variables used are subjected to standard OLS and probit estimation. The properties of these estimators are then ascertained via simulation. Finally, bias-corrected maximum likelihood estimates are obtained via bootstrapping.

These variables generally perform poorly but the ability of money supply to explain index movements depends crucially on an underlying systemic analysis. In addition, indications of future specifications are derived from the simulation results.

Khabo (2002) evaluating the impact of monetary policy on a small and open economy in the case of the South Africa for the period 1960-1997 used M3 to measure monetary policy. The ordinary least square (OLS) method was employed, as well as the Augmented Dickey Fuller test to check for stationarity.

Norfeldt (2014) estimate the interaction between returns on the US stock market (Standard & Poor's 500 and Dow Jones Industrial Average), US monetary policy and the Investor Sentiment using a structural vector autoregressive (VAR) methodology. The full sample consists of observations spanning from January 2000 to November 2014.The different measures

of a monetary policy are the rate change (which has been separated in to an expected change and an unexpected change) and the growth rate of money supply (M2). The study finds that, on average, there is a significant relationship between an expected change in the fed fund target rate and stock market returns.

As regards the empirical relation between money supply and stock prices, Rozeff (1974) using granger causality finds that money supply variables offer no possibility of gaining abnormal returns. For efficient markets to hold changes in one variable should not systematically predate changes in another. This is in line with findings on the direction of causality.

Osisanwo and Atanda (2012) looking at the determinants of stock market returns in Nigeria using a time series analysis indicated that interest rate, CPI, previous stock return levels, money supply and foreign exchange rate are the main determinants of stock returns in Nigeria. Li (2012) investigate whether the European Central Bank's frequent funding action can strengthen the stock market or not, the actual relationship between money supply and stock market in Europe deserves research, especially during the debt crisis. The study was then verified by empirical analysis based on ADF unit root test and Johansen cointegration test. By creating cointegration model and Vector Error Correction Model and carrying on Granger causality test, further examinations revealed the interaction between money supply and stock market capitalization in the short and long term. The results suggest that stock market capitalization is conversely related to money supply in the long run, whereas money supply has positive impact on stock market capitalization in the short-term, but it's not the Granger reason of stock market capitalization.

Aziza, (2010) attempt to identify and establish the relationship between monetary policy and stock market performance and to determine if there are similarities of monetary policy in

developed and developing countries. The study using OLS establish that the supply of money alongside other variables like the condition of credit and the price level influence the performance of the stock market over the short, medium and long run period, these different variables exhibit different behaviours in various countries and the degree of their influence varies between countries.

Mukherjee and Naka (1995) considered the relationship between stock prices and several macroeconomic variables which include exchange rate, money supply, index of industrial production, inflation and interest rates. They used data for the period January 1971 to December 1990 on a Vector Error Correction Model. They revealed a positive relationship for all other variables except for inflation and interest rates were a mixed relationship was observed.

Muktadir–Al-Mukit, (2013) investigate the effectiveness and consequence of various monetary variables of monetary policy commenced by central bank on the stock market performance of Bangladesh using Co-integration technique, ECM and Granger Causality. The study discovered the existence of unidirectional causality from inflation, money supply and T-bill to stock market performance index.

Maysami and Koh (2000) investigating the conditions of the Asian market with OLS analysis revealed a positive relationship between the money supply and the development of the SGX index (Singapore stock exchange), confirming the hypothesis that a growth in the money supply will cause inflation, which causes a growth in future cash-flow and share prices. The same results confirm Maysami, Howe and Hamzah (2004), who discloses a positive dependence between money supply change and stock price evolution on Singapore stock exchange. However, Cagli, Halac and Taskin (2010) dealt with the relationship between money supply and stock

prices on another emerging market – the Turkish market. These authors did not confirm any co-integration between these variables.

The effects of the changes in macroeconomic factors (including the money supply) on the development of stock prices were discussed also by Shaoping (2008), who confirmed a very strong effect of the money supply on the development of stock prices in the period between 2005-2007. As stated, he found a long-term and stable relationship between stock prices and monetary aggregate M0, M1 and M2. Similarly, stock prices and money supply had a positive co-integration. The positive co-integration has thus resulted that the growth of money supply results in the rising prices of equity shares.

On the Japanese market, Kimura and Koruzomi (2003) using OLS regression method discovered no relationship between the change in the money supply and the development of stock prices.

Muktadir-AI-Mukit and Shafiullah (2012) investigate the impact of monetary policy variables on the performance of recent post crashed stock market of Bangladesh using different econometric approaches like Co-integration technique, Granger Causality and ADF Unit root test. Results reveal that repo rate has a positive influence on market index where inflation and money on market Index.

Raymond (2009) investigate the interrelationship between stock prices and monetary indicators for Jamaica using Co-integration technique, PP, Granger Causality, ADF and VECM to analyze M2, M3, InfR, IR and EXR. The results show that there are long term relationships between the stock market returns and the monetary variables examined. Granger Causality test shows that only M2 is a consistent predictor of the stock price impling that the central bank

could influence stock market growth by targeting M2, as this is a better predictor of future stock prices, rather than inflation, interest rate and exchange rate.

Agbonlahor (2014) evaluate the effectiveness of the Bank of England's monetary policy over these years under study on the UK economic growth using the major objectives of monetary policy variables. The study using granger causality finds that the inflationary rate and money supply are significant monetary policy instruments that drive growth in the UK.

Tsoukalas (2003) examined the relationship between stock prices and macroeconomic factors in Cyprus using the Vector Autoregressive model. The variables examined include exchange rate, industrial production, money supply, and consumer prices. The result of the study indicates a strong relationship between stock prices and all the macroeconomic factors.

Abakah (2009) examines the long and short-run relationships between monetary policy and stock prices as well as some selected macroeconomic variables as inflation and exchange rates in Ghana. The study using Co- integration technique, Granger Causality, ADF and VECM to analyze variables like M2, IR, InfR and EXR identified an expected long-run negative relationship between interest rates and stock prices and also between exchange rates and stock prices amongst others. Seong (2013) investigate further the evidence of the effect of monetary policy on the Singapore stock exchange using E&G Co- integration, E&G ECM and PG Causality test discover that there is a causal relationship between monetary policy in money supply both narrow and broad money supply and Singapore stock exchange performance.

2.3.2 Deposit Money Banks total credit and stock Market Performance

The total credits of commercial banks are basically influenced by many factors including interest rates. The empirical review will explore the role of interest rates of Deposit money banks on total banks credit and as it relates to stock market performance. Mahmudul and Gazi (2009)

examine the relationship between interest rate and stock price as evidence in fifteen developed and developing countries- Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, Philippine, S. Africa, Spain, and Venezuela. To investigate the reasons of market inefficiency, relationship between share price and interest rate, and changes of share price and changes of interest rate were determined through both time series and panel regressions. For all of the countries it is found that interest rate has significant negative relationship with share price and for six countries it is found that changes of interest rate has significant negative relationship with changes of share price. So, if the interest rate is considerably controlled for these countries, it will be the great benefit of these countries' stock exchange through demand pull way of more investors in share market, and supply push way of more extensional investment of companies.

Hsing (2004) adopts a structural VAR model that allows for the simultaneous determination of several endogenous variables such as, output, real interest rate, exchange rate, the stock market index and found that there is an inverse relationship between stock prices and interest rate.

Chen and Hu (2015) estimate the interaction between interest rates and stock returns in China by employing the structural vector autoregressive (SVAR) models with a long-run restriction, and the interaction in US is analyzed as a comparison. By analyzing the impulse responses and variance decompositions which were generated from the SVAR models, they confirm the interaction between interest rates and stock returns in China. However, compared to that in US, the magnitude of interaction in China is much smaller, showing that the effectiveness of interest rates as a monetary policy tool is still low.

The dissertation of Luo and Wang (2003) shows that stock returns are negatively correlated with interbank interest rates in the long term by applying Engle-Granger approach to Chinese market. Based on error correction model and cointegration model, Liu (2005) and Luo (2009) also prove that stock prices react negatively to interest rates shock in China. Moreover, they find that stock prices and interest rates share not only the common trend in long run but also the common volatility in short run.

Lee (1997) used three-year rolling (OLS) regressions to analyze the relationship between the stock market and the short-term interest rate in china. He found that the relationship is not stable over time. It gradually changes from a significantly negative to no relationship, or even a positive, although insignificant relationship.

Uddin and Alam (2007) examine the multiple linear regressions to ascertain the relationship between share price and interest rate, share price and changes of interest rate, changes of share price and interest rate, and changes of share price and changes of interest rate on Dhaka Stock Exchange (DSE). For all of the cases, included and excluded outliner, it was found that Interest Rate has significant negative relationship with Share Price.

Chirchir (2014) examine how changes in interest rates (represented by the weighted average lending rate by commercial banks in Kenya) and stock prices (proxied by the NSE 20 share index) are related to each other for Kenya over the period October, 2002-September, 2012. The research used Toda and Yamamoto (1995) method to determine the relationship between stock prices and interest rates. This method is applicable to determine whether the Vector Auto Regression (VAR) may be stationary (around a deterministic trend), integrated of an arbitrary order, or cointegrated of an arbitrary order. The results indicated that there is no significant causal relationship between interest rate and share price.

Hamrita and Abdelkader (2011) examine the relationship between the interest rate, foreign exchange rate and stock price using a wavelet transform in US over the period from January 1990 to December 2008. They discovered that interest rate and stock index returns had no causal relationship of any form rather foreign exchange rate return and stock index return were found to have a bidirectional relationship in this period at longer horizons.

There is a cointegrating relationship between macroeconomic variables in a study by Adam and Tweneboah (2008) in Ghana. Using Johansen's cointegration and innovation accounting techniques, they have shown that a long run relationship exists between the variables studied. Interest rate has negative impact on the stock market in Ghana.

On the other hand, Kyereboah-Coleman and Agyire-Tettey (2008) showed that lending rates charged by the banks have negative impact on stock market performance in Ghana, which prevents the business growth (OLS regression analysis).

Ologunde, Elumilade, and Asaolu (2007) studied the stock market capitalization and interest rate in Nigeria using an ordinary linear regression model. Their results showed that prevailing interest rate has positive influence on stock market capitalization rate. When interest rate is increased, stock market capitalization will increase as well. Economic growth and development is retarded. Government can therefore plan and control the interest rate to help the growth of the stock market.

Another study in Ishfaq, Ramiz and Awais (2010) examine the relationship between stock return, interest rate and exchange rates in Pakistani economy over the period of 1998-2009. A multiple regression model was applied to test the significance of change in interest rate and exchange on stock returns. The results indicated that both the change in interest rate and change in foreign exchange rate have a significant impact on stock returns over the sample period.

Looking at bank total credit on economic growth, Emecheta and Ibe (2014) investigates the impact of bank credit on economic growth in Nigeria applying the reduced form of vector autoregressive (VAR) technique using time series data from 1960 to 2011. Their study shows that there is a significant positive relationship between bank credits to the private sector, broad money and economic growth.

Ben Salem and Trabelsi (2012) explore the importance of financial development as a determinant of growth in seven SEMCs during the period 1970-2006 by applying the Pedroni' spanel co-integration analysis. The paper suggests the existence of a long-run relationship between finance and growth. Besides, very weak support is provided to the supply-side hypothesis. Indeed, economic growth leads to financial sector development. Ben Salem and Trabelsi relate these findings to macroeconomic imbalances, weak institutional development and the weakness of the private sector in the southern and eastern Mediterranean region.

Sanusi and Salleh (2007) examine the relationship between financial development and economic growth in Malaysia covering the period 1960-2002. Three measures of financial development were used, namely, ratio of broad money to GDP, credit provided by the banking system, and deposit money banks to GDP. By employing the autoregressive distributed lag approach, the study found that ratio of broad money to GDP, and credit provided by the banking system has positive and statistically significant impact on economic growth in the long-run. The results further indicated that a rise in investment will enhance economic growth in the long-run. Using panel analysis and Fully Modified OLS (FMOLS) methods Kiran, Yavus, and Guris (2009) investigate the relationship between financial development and economic growth for ten emerging countries over the period 1968–2007. Three measures of financial development (ratio of liquid liabilities to GDP, bank credit to GDP, and private sector credit to GDP) were used to

quantify the impact of financial development on economic growth. The results concluded that financial development has a positive and statistically significant effect on economic growth.

Yakubu and Affoi (2014) also examine the role of commercial bank credit to the economy; the commercial bank credit to the private sector of the economy is used to estimate its impact on Nigeria's economic growth, which is proxy by gross domestic product. Using the ordinary least square it was found that the commercial bank credit has significant effect on the economic growth in Nigerian. As this is a good achievement, it requires more efforts to maintain and sustain it.

2.3.3 Consumer Price Index and Stock Market performance

Looking at empirical review on consumer price index vis a vis inflation rate as a monetary policy tool on stock market performance, De Grauwe (2008) investigate Stock prices and monetary policy using Mean squared forecasting Errors (MSFEs) model. The study discovered that monetary policies can be effective in reducing macroeconomic volatility thereby improving trade-off between output and inflation variability.

Muktadir-AI-Mukit and Shafiullah (2014) investigate the impact of monetary policy variables on the performance of recent post crashed stock market of Bangladesh using different econometric approaches like Co-integration technique, Granger Causality and ADF Unit root test. Results reveal that repo rate has a positive influence on market index where inflation and money on market Index has inverse effect.

Galebotswe and Thalefang (2012) also investigate the impact of monetary policy shocks on stock returns in Botswana. The study using VAR indicate that positive interest rate and inflation rates changes are associated with increases, rather than decreases, in the aggregate stock returns of companies listed on the Botswana stock Exchange.

Kurov (2009) explains that the two primary goals of monetary policies are to keep a stable price level and maintain a sustainable economic growth empirical survey. However, these goals can only be achieved through the effects that monetary policies has on financial markets. He aims to answer if monetary policy decisions have an impact on the sentiment of stock market investors and if the investor psychology influences the stock market's reaction to monetary news. Kurov uses two measures of investor sentiment changes. The first measure is an index consisting of changes in the following six variables NSYE (New York Stock Exchange) turnover, closed-end fund discount, number of IPOs (Initial Public Offering), first-day return on IPOs, the equity share in the new issues and the dividend premium. The second investor sentiment proxy is the change in the Investor Sentiment Index computed using the Investor Intelligence survey, the survey represents the outlook of over 120 independent market newsletters and classifies the newsletters as bullish, bearish or correlation.

Kurov compute an investor sentiment index as a ratio of the percentages of bullish advisors to the sum of the percentages of bullish and bearish advisors so the index is bounded between one and zero. High values of the index indicate increased Investor Sentiment and therefore more speculative. He uses an event study approach with a sample that extends from January 1990 to November 2004, which includes 129 observations on decisions made by the FOMC (Federal Open Market Committee) regarding the Federal Funds Target Rate. For the response on the stock market he uses daily returns on the S&P 500 index. The result of his research implies that monetary policy surprises have a strong impact on investor sentiment in bear market periods.

The estimated OLS coefficient of a monetary surprise in bull markets is -0,68 (statistically insignificant), so a hypothetical unexpected 100-basis point decrease of the federal

fund target leads to a 0,68% increase in S&P. But the estimated coefficient in bear markets implies that stock prices will increase by 11,85% (statistically significant). An explanation of this could be that investors tend to overreact to surprises in bear market periods.

Spyrou (2001) also studied the relationship between inflation and stock returns using OLS regression analysis but for the emerging economy of Greece. Consistent with Kaul's results, Spyrou (2001) found that inflation and stock returns are negatively related, but only up to 1995 after which the relationship became insignificant.

Tsoukalas (2003) examine the relationship between stock prices and macroeconomic factors in Cyprus using the Vector Autoregressive model. The variables examined include exchange rate, industrial production, money supply, and consumer prices. The result of the study indicates a strong relationship between stock prices and all the macroeconomic factors.

Osisanwo and Atanda (2012) looking at the determinants of stock market returns in Nigeria using a time series analysis indicated that interest rate, CPI, previous stock return levels, money supply and foreign exchange rate are the main determinants of stock returns in Nigeria. Therefore, this study based on multiple regression result proffer the need to adopt a mixed policy approach between capital and monetary market instruments in order to enhance the returns in the Nigerian Stock Exchange.

Chen (2007) investigates whether monetary policy has asymmetric effects on stock market returns or not. Numerous studies have been done on the topic using money aggregate as a measure of money supply. Some empirical studies suggests that stock returns lag behind changes in monetary policy, but in contrast, some studies have shown that there is no significant forecasting power of past changes in money. Chen (2007) uses a Markov-switching model to examine the asymmetric effects that monetary policy has on the stock market. For estimations of

the model he uses monthly data from the Standard & Poor's 500 price index, for data about monetary policy he uses money supply (M2), discount rates and federal fund target rate. The paper focuses on the U.S. stock market and the data is from January 1965 to November 2004. He also subtracts the CPI (inflation) from nominal returns to obtain real returns.

The empirical result from monthly returns on S&P500 displays that, in both bull and bear markets, when monetary policy is measured by interest rate instrument a contractionary monetary shock strongly decreases the real return in granger causality result. But, a monetary shock in a bear-market regime displays larger effects.

The coefficients for money supply shows that a contractionary monetary policy (a decrease in money supply) leads to a decrease in stock returns, regardless of the mind-set of the investors. However, the effects of money supply are not statistically significant in either one of the regimes (bull or bear market) and therefore it does not seem good to use monetary supply as a measure for monetary policy.

Raymond (2009) investigate the interrelationship between stock prices and monetary indicators for Jamaica using Co-integration technique, PP, Granger Causality, ADF and VECM to analyze M2, M3, InfR, IR and EXR. The results show that there are long term relationships between the stock market returns and the monetary variables examined. Granger Causality test shows inflation rate and foreign exchange rate is not a good predictor of stock prices but only M2 is a consistent predictor of the stock price implying that the central bank could influence stock market growth by targeting M2, as this is a better predictor of future stock prices, rather than inflation, interest rate and exchange rate.

Aziza, (2010) attempt to identify and establish the relationship between monetary policy and stock market performance and to determine if there are similarities of monetary policy in

developed and developing countries. The study using OLS establish that the supply of money, the condition of credit and the price level influence the performance of the stock market over the short, medium and long run period, these different variables exhibit different behaviours in various countries and the degree of their influence varies between countries.

Abakah (2009) examines the long and short-run relationships between monetary policy and stock prices as well as some selected macroeconomic variables as inflation and exchange rates in Ghana. The study using Co- integration technique, Granger Causality, ADF and VECM to analyze variables like M2, IR, InfR and EXR identified an expected long-run negative relationship between interest rates and stock prices and also between exchange rates and stock prices amongst others.

2.3.4 Foreign Exchange Rate and Stock Market Performance

Currency appreciation and depreciation play significant role on stock market reactions. According to Dimitrova (2005) currency depreciation will lead to stock market depression in United States and United Kingdom. His study showed that when foreign exchange rate declines by one percent, the stock market will react with less than one percent decline. Dimitrova proposed that US should implement policy to strengthen the US dollar. Since there is a negative relationship between foreign exchange rate and stock market index, the policy will help the stock market. However, Dimitrova also found insignificant results in his attempt to show that foreign exchange rate will depreciate during the booming of the stock market. Thus, multinational companies which use foreign exchange rate forecasting can consider to use stock market as a forecasting indicator as a proxy. The currency is expected to depreciate during periods of bullish sentiments in the stock market.

Foreign exchange rate is not always expected to have negative impact on the stock market. The appreciation of foreign exchange rate has positive impact on the United Kingdom non-financial firms' stocks return (Ahmed & Omneya, 2007). Two reasons were given. First, U.K. international trade is greatly involved in trading with Europe and U.S. and Japan. Second, the basket of foreign currencies is used in the portfolio. Thus, the exposure of the foreign exchange rate risk in the portfolio is lower.

Chong and Tan (2007) applied Kwaiatkowski Philips, Shmidt and Shin (KPSS) cointergration test on the macroeconomic factors against the volatility of foreign exchange rate on 4 countries, Malaysia, Indonesia, Thailand and Singapore. Their study showed that the macroeconomic factors which are interest rate, money supply, consumer price index, trade balance and composite indices move in the same direction with foreign exchange rate in the long run. Authorities and market players should smooth the foreign exchange rate variability and pursue economic policies that will give greater foreign exchange rate stability.

Mukherjee and Naka (1995) considered the relationship between stock prices and several macroeconomic variables which include exchange rate, money supply, index of industrial production, inflation and interest rates. They used data for the period January 1971 to December 1990 on a Vector Error Correction Model. They revealed a positive relationship for all other variables except for inflation and interest rates were a mixed relationship was observed.

Raymond (2009) investigate the interrelationship between stock prices and monetary indicators for Jamaica using Co-integration technique, PP, Granger Causality, ADF and VECM to analyze M2, M3, InfR, IR and EXR. The results show that there are long term relationships between the stock market returns and the monetary variables examined. Granger Causality test shows that only M2 is a consistent predictor of the stock price implying that the central bank

could influence stock market growth by targeting M2, as this is a better predictor of future stock prices, rather than inflation, interest rate and foreign exchange rate pose not to be a good predictor of future stock prices.

Osisanwo and Atanda (2012) looking at the determinants of stock market returns in Nigeria using a time series analysis indicated that interest rate, CPI, previous stock return levels, money supply and foreign exchange rate are the main determinants of stock returns in Nigeria. Therefore, based on multiple regression findings this study proffer the need to adopt a mixed policy approach between capital and monetary market instruments in order to enhance the returns in the Nigerian Stock Exchange.

Kyereboah-Coleman and Agyire-Tettey (2008) simple regression study showed that foreign exchange rate has negative impact on the stock market index in Ghana. Investors in Ghana benefit from the foreign exchange rate losses as the domestic currency depreciated.

Kirui, Wawire and Onono (2014) determine the effect of changes in each of the macroeconomic variable on the volatility of stock returns in Nairobi Securities exchange. The results of the TGARCH model for exchange rate, Gross Domestic product and Treasury bill rate reveal that the impact of news was asymmetric and there was presence of leverage effects. There was absence of volatility persistent among all the macroeconomic variables

Abakah (2009) examines the long and short-run relationships between monetary policy and stock prices as well as some selected macroeconomic variables as inflation and exchange rates in Ghana. The study using Co- integration technique, Granger Causality, ADF and VECM to analyze variables like M2, IR, InfR and EXR identified an expected long-run negative relationship between interest rates and stock prices and also between exchange rates and stock prices amongst others.

On the other hand, Li (2012) study shows that in China, both stock returns and Renminbi (RMB) nominal foreign exchange rate are integrated of order one I(1). However, Engle-Granger test shows that there is no long run relationship between the two at 5 percent significance level. Foreign exchange rate does not Granger-cause the stock returned.

Tsoukalas (2003) examined the relationship between stock prices and macroeconomic factors in Cyprus using the Vector Autoregressive model. The variables examined include exchange rate, industrial production, money supply, and consumer prices. The result of the study indicates a strong relationship between stock prices and all the macroeconomic factors.

Hamrita and Abdelkader (2011) examine the relationship between the interest rate, foreign exchange rate and stock price using a wavelet transform in US over the period from January 1990 to December 2008. They discovered that foreign exchange rate returns and stock index returns were found to have a bidirectional relationship in this period at longer horizons.

Aydemir and Demirhan (2009) found that there is a bi-directional relationship (granger causality study) between foreign exchange rate and all the stock market indices in Turkey. There are mixed, positive and negative, causality results from some of the stock market indices to the exchange rate. However, there is only negative causal relationship from foreign exchange rate to all stock market indices.

2.4 Summary of Literature Reviewed

Author/year	Period	Title	Methodology/Variables	Findings
Muktadir – Al-Mukit,D (2013)	2006-2012	An Econometric Analysis of the Impact of Monetary Policy on Stock Market performance in Bangladesh.	Co- integration technique, ECM and Granger Causality **Var: Dep.:** DGEN **Indep:**M2,RR,InfR, TTBR	The study discovered the existence of unidirectional causality from inflation, money supply and T-bill to market index.
Iglesias, E.M. and Haughton,A.	1999-2009	Interaction between monetary policy and stock prices: A comparison between the Caribbean and the US.	VAR **Dep:** SI **Indep:** TBR,IR InfR	The study discovered that the effect of a monetary policy shock is greater in the US; while the effect of a stock price shock is smaller in the US than

Y.(2011)				in the Caribbean.
Seong, L. M. (2013)	1991-2013	Transmission of monetary policy to the stock Exchange: Further Evidence from Singapore.	E&G Co- integration, E&G ECM,andPG Causality test. **Var: Dep.:**STR **Indep.;**MI, M2,M3 FDR, LR	The study discovered that there is a causal relationship between monetary policy and Singapore stock exchange
Grauwe, P. (2008)		Stock prices and monetary policy	Mean squared forecasting Errors (MSFEs) model. **Var:** Dep.; ST Indep.;IR, InfR.	The study discovered that monetary policies can be effective in reducing macroeconomic volatility thereby improving trade-off between output and inflation variability.
Fern'andez-Amador, O G¨achter, M Larch, M& Peter, G. (2011)	1999-2009	Monetary policy and its impact on stock market liquidity: Evidence from the euro zone	PE and VAR **Var: Dep.:**IR and InfR. **Indep,:** To, TV, ILLIQ, TP, R-IMP, R-REL, S-REL	The study discovered that an expansionary monetary policy of the European Central Bank leads to an increase of stock market liquidity in the German, French and Italian markets
Agbonlahor, O.(2014)	1940-2012	The impact of monetary policy on the economy of the United Kingdom : a vector correction model(VECM)	VECM **Var:** RGDP, MS, INF, PRICE, BANK, REXRT, CAD	The study finds that the inflationary rate and money supply are significant monetary policy instruments that drive growth in the UK.
Galebotswe, O. and Tlhalefang, J. B. (2012)	1993-2010	Monetary policy shock and stock returns Reactions: Evidence from Botswana	VAR **Var:** Dep: IR, RER, RSR. Indep: WOP, RGDP, InfR,	Results indicate that positive interest rate changes are associated with increases, rather than decreases, in the aggregate stock returns of companies listed on the Botswana stock Exchange.
Muktadir AI Mukit, D. and Shafiullah,	2011-2013	Impact of monetary policy on post crashed stock market performance: Evidence from Dhaka stock Exchange	Co- integration technique, Granger **Var: Dep:** DGEN **Indep.:** M2, RR, InfR.	Results reveal that repo rate has a positive influence on market index where inflation and money on market Index has inverse effect
A.Z.M. (2012)		To investigate the impact of monetary policy variables on the performance of recent post crashed stock market of Bangladesh using different econometric approaches.	Causality and Unit root test.	Index. Central Bank can influence stock market performance using monetary policy especially money supply
Singh, A (2014)	2000-2014	A study of Monetary policy Impact on stock market returns.	ADF, PP and ARCH, GARCH, Granger Causality **Var: Dep:** WPI, GDP, SLR **Indep:** RR, RRR, NIFTY,CRR, Bank NIFTY, IIP,BCI, BL	This analysis had proven that IIP influenced by changes of CRR. Interest rates found to be non-significant when it comes to be NIFTY volatility. Arch model had proven that NIFTY volatility is getting influenced whenever monetary policy announced.
Yakob, N.A.	1989-2001	Monetary uncertainty and stock prices: The case of Malaysia.	Co- integration technique ADF,VECM and Unit root test.	Monetary uncertainty has no significant relationship with the stock prices, and the uncertainty in

			Var: Dep.: STKGROW Indep.: MONMASD, STKMASD	monetary policy is co-integrated in the stock prices
Tavares, J and Valkanov, R. (2003)	1960-2000	Fiscal policy and Asset Returns.	VAR **Var:** Dep: SY Indep: TY, FFR,GY, GC, InfR	Fiscal policy shocks account for 3-4% of the variation in unexpected stock returns and 8-10%of the variation in unexpected bond returns.
Osisanwo, B. G. and Atanda, A.A. (2012)	1984-2010	Determinants of stock market returns in Nigeria: A Time series Analysis.	OLS **Var:** Dep: NSEDX, Indep: EXC, PCI, M2, IR, CPI	The findings indicated that interest rate, previous stock return levels, money supply and exchange rate are the main determinants of stock returns in Nigeria.
Chatziantoniou, I., Duffy, D. and filis, G.	1991-2004	Stock market response to monetary and Fiscal policy shocks: multi- country Evidence.	VAR **Var:** Dep: GDP Indep: GEA, GOV, MS, INT, SMR.	The results show that both fiscal and monetary policies influence the stock market, via either direct or indirect channels.
Hsing, Y. (2013)	1999-2012	Effects of fiscal policy and monetary policy on the stock market in Poland.	GARCH model, ADF. **Var:** Dep: GDP, Indep.:SP, IR, EX, Infr, IP, GSMI.	The study finds that Poland's stock market index is not affected by the ratio of government deficits or debt to GDP and is negatively influenced by the money market rate.
Nwakoby , C. and Alajekwu, U.B.(2016)	1986-2013	Effect of monetary policy on Nigeria stock market performance.	Co- integration technique, OLS, Granger Causality **Var:** Dep. :AI, Indep.: MPR, TBR, INT, LR, DR	Monetary policy has the potential (53%) to influence the stock market, but the causality analyses showed that monetary policy cannot influence stock market performance but rather stock market performance has influenced the direction of monetary policy in Nigeria through lending and deposit rate.
Abakah, E. (2009)	1990-2006	The impact of monetary policy on stock prices in Ghana.	Co- integration technique, Granger Causality, ADF, VECM **Var:** Dep.: GSEI Indep.:M2, IR,InfR, EXR,	The study identified an expected long-run negative relationship between interest rates and stock prices and also between exchange rates and stock prices amongst others.
Barasa, J.W. (2014)	2000-2013	Macro-economic determinants of stock market performance in Kenya: case of Nairobi Securities Exchange.	**OLS** **Var: Dep.:**NSEL **Indep.:** M2, InfR, Real-GDP.	The study results established that NSE 20-Share index (used to measure stock market performance) as well as CPI (used to measure inflation), money supply (used M3), and GDP per capita deteriorated just before, during and immediately after the general elections.
Kirui, E. Wawire, N.H. W. Onono, P.O. (2014)	2000-2012	Macroeconomic Variables, Volatility and Stock Market Returns: A Case of Securities Exchange, Kenya.	TGARCH **Var: Dep.:** NSEI, **Indep.:** M2, INF, EX, TBR, real-GDP	The results of the TGARCH model for exchange rate, Gross Domestic Product and Treasury bill rate reveal that the impact of news was asymmetric and there was presence of leverage effects. There was

				absence of volatility persistent among all the macroeconomic variables
Sourial, M.S.	1992-2000	Monetary policy and its impact on the stock market: the Egyptian case.	Bayesian-VAR **Var: Dep.:** HFI **Indep.:** CPS, DR, MI &M2, InfR, EXR	The results provided evidence that in the future the stock market could be an effective channel in transmitting the monetary policy rather than the traditional credit channel
Raymond, K. (2009)	1990-2009	Is there a long run relationship between stock prices and monetary variables? Evidence from Jamaica.	Co- integration technique, PP, Granger Causality, ADF, VECM **Var: Dep.:**JSEI Indep.:M2, M3, InfR, IR. EXR.	The results show that there are long term relationships between the stock market returns and the monetary variables examined. Granger Causality test shows that only M2 is a consistent predictor of the stock price implying that the central bank could influence stock market growth by targeting M2, as this is a better predictor of future stock prices, rather than inflation, interest rate and exchange rate.
Aziza,F.O.F. (2010)	1988 – 2008	The effects of Monetary Policy on Stock Market performance. A cross country Analysis.	VECM, Co – integration, Unit root Var; Dep.; M Indep; G, L, InfR	The study has been able to establish that the supply of money, the condition of credit and the price level influence the performance of the stock market over the short, medium, and long run period. These different variables exhibit different behaviours in various countries and the degree of their influence varies between countries.
Lithman, O. (2012)		Money Supply and Stock Prices	OLS, Probit estimation	The ability of money supply to explain index movements depends on underlying systematic analysis. Also indications of future specifications are derived from the simulation results.
Khabo, V. S. (2002)	1960 -1997	The Impact of monetary policy on the Economic growth of small and open economy: The case of South Africa.	OLS, ADF	The study found that economic growth is significantly influenced by money supply.
Norfeldt, O. (2014)	2000 – 2014	The effects of monetary policy on stock market returns. A study of how the actions of the Federal Reserve affect the returns on the American Stock Market.	VAR	The study found that on the average, there is a significant relationship between an expected change in the federal fund target rate and stock market returns
Mukherjee, T. K. and Naka, A. (1995)	1971 – 1990	Dynamic Relations between Macroeconomic variables and the Japanese stock market: An Application of vector Error	VECM	The study revealed a positive relationship for all the variables except for Inflation and Interest rates where a mixed relationship was

		Correction Model		observed
Mahmudul and Gazi (		Relationship between Interest Rate and Stock Prices: Empirical Evidence from Developed and Developing countries.		The study found that Interest rate has significant negative relationship with share price
Chen and Hu (2015)		The Interaction between Interest Rates and Stock Returns. A comparison between China and US	SVAR	The result confirms the interaction between interest rates and stock returns in China but when compared to that of US the magnitude of interaction in China is much smaller.
Uddin,M. G. S. and Alam, M. M. (2007)		The Impact of Interest rate on stock market: Empirical evidence from Dhaka Stock Exchange		Interest Rate has significant negative relationship with share price
Chirchir, D. (2014)	2002-2012	The relationship between share prices and Interest Rates: Evidence from Kenya	VAR	The result indicate no significant causal relationship between Interest rte and share price
Hamrita, M. E. and Abdelkader, T. (2011)	1990 – 2008	The relationship between Interest Rate, Exchange Rate and stock price: A wavelet Analysis		The study discovered that Interest Rate and Stock index returns had no causal relationship of any form rather exchange rate return and stock index return have a bi-directional relationship in this period at long run
Spyrou,I. S. (2001)		Stock Returns and Inflation: Evidence from an Emerging market		Inflation and stock returns are negatively related and insignificant
Tsoukalas, D. (2003)		Macroeconomic factors and Stock prices in the Emerging Cyprus Equity Market.	Vector Auto regressive model	Result show strong relationship between stock prices and all the macroeconomic factors
Aydemir, O. and Demirhan, E. (2009)		The relationship between Stock Prices and Exchange rates: Evidence from Turkey.		The study found a bi- directional relationship between exchange rate and all the stock market indices in Turkey. There is also negative causal relationship from exchange rate to all stock market indices.
Chen, S. S. (2007)	1965 – 2004	Does Monetary Policy have Assymetric Effects on Stock Returns?	Markov – switching model	The coefficients for money supply shows that a decrease in money supply leads to a decrease in stock returns regardless of the mind-set of the investors. However, the effects of money supply is not statistically significant and therefore, it does not seem good to use money supply as a measure for monetary policy
Li, Y. (2012)		Empirical Study on the relationship between Money Supply and Stock Market in Europe	ADF, Unit root test, Johansen Co-integration, VECM, Granger Causality test	Results show that stock market capitalization is conversely related to money supply in the long run, where as money supply has positive impact on stock market capitalization in the

				short run but it is not the granger reason of stock market capitalization
Emecheta, B. Cand Ibe, R. C. (2014)		Impact of Bank credit on economic growth in Nigeria: Application of reduced Vector Auto – Regressive (VAR) Technique	RVAR	The study shows that there is a significant positive relationship between bank credit to the private sector, broad money and economic growth.
Yakubu, Z and Affoi, A. Y. (2014)		An analysis of Commercial Banks' Credit on Economic Growth in Nigeria.	OLS	The study found that commercial bank credit has significant effect on the economic growth in Nigeria

Source: Researcher's Compilation

KEY: DGEN-Dhaka Stock Exchange General Index, **M2-**money supply, **RR-**repo rate, **InfR-** inflation rate, **TTBR-**three-month Treasury bill rate, **TBR-**Treasury Bill rate, **IR-**Interest Rate, **SI-**Stock Index, **E&G Co-integration-**Engle-Granger Co-integration, **E&G ECM-**Engle- Granger two step Error Correction Model and **PG Causality-**pair wise Granger Causality, **M1,M2,M3 –**broad money supply and money supply, **FDR**- Fixed Deposit Rate, **LR/L**: lending Rates , **STR**- Straits Time Index **ST**- Stock prices, **PE-**panel Estimation model, **TR-**turnover rate, **TV**- trading volume, **ILLIQ-**illiquidity ratio, **TP-**turnover prices impact, **R-IMP-**roll impact, **R-REL-**relative roll proxy, **S-REL-** relative bid –ask spread, **RGDP**- real GDP, **MS/M2**- Money Supply, **INF-** Inflation, **BANK**- Bank rate, **PRICE**- Consumer Price Level, **REXRT**-real effective exchange rate, **CAD**- current account deficit, **WOP-** World Oil Price, **RER**- real exchange rate, **RSR**- real stock returns, **TY-**net tax receipts, **SY-**government purchases, FFR-federal funds rate, **GY-**output growth rate, **GC**- consumer growth rate, **NSEDX**-NSE all share index, **EXC-**official exchange rate, **CPI-**consumer price index, **PCI**- per capital income, **GEA-**global economic activities, **GDP-**gross domestic Product, **INF**-Inflation, **GOV**-government spending, **MS**-Money Supply, **INT**- interest rates, **SMR-**stock market returns, **SP-**share price, **EX-**exchange rate, **IP**- industrial production, **GSMI**-global stock market indices in Germany and USA, **ASI**-All share index, **MPR-**monetary policy rate, **INT**-interest rate (lending), **DP**- deposit rate, **LR**-liquidity ratio, **GSEI**-Ghana stock exchange all share index, **NSEI**-NSE 20-share index, **real-GDP-** real output, **HFI-**Hermes Financial Index (Egyptian stock market), **CPS-**credit to private sector, **DR-**discount rate, **MONMASD**-Moving average of standard deviation for money growth, **RR**-Repo Rate, **RRR**-reverse repo rate, **BL**-Bank liquidity, **G**-Money and quasi money growth, **M**- growth rate of Market capitalization.

2.5 Gap in Literature

From the empirical reviews, majority of the works done to examine the interaction between monetary policy and stock market performance revealed the following gaps;

Most focused on economic growth analysis (Adebiyi, 2005; Nouri & Samimi, 2011; Fasanya, Onakoya & Agboluaje, 2013)

i) There were limited empirical reviews on bank total credit on stock market performance; the most the researcher could get was bank total credit on economic growth.

ii) There were very limited regional African works on the developing African economies with its peculiarities.

iii) The variables of study for the majority of the works did not adequately capture CPI (Inflation), exchange rate, Money supply and Deposit Money Bank Total Credit which constitute key monetary policy instrument.

iv) The analytical methods adopted in most cases for data are basically OLS, VAR and cointegration methods for both time series and panel data characteristics (Nouri & Samimi, 2011; Khabo, 2002 & Darrat, 1998).

v) There were evident variations and discrepancies in some of the results obtained by various researchers particularly when compared with the apriori expectations (Dele, 2007 and Rafiq & Mallick, 2008).

This study will ride on the listed observed gaps to cover the following:

i) Carry out a regional panel study of selected African developing countries.

ii) Use more prominent monetary policy measurement parameters as well as stock market performance indicator. The variable to be used to capture stock market performance is market capitalization while money supply, consumer price index, foreign exchange rate and deposit money banks total credit are monetary policy indices.

iii) Adoption of a more flexible and robust statistical Analysis technique that will accommodate panel data features.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Research Design

This study adopts the *ex-post facto* research design which is very common and ideal method of conducting research in business and social sciences. According to Simon and Goes (2013), *ex- post facto* design is one which is based on a fact or event that has already occurred and at the same time employs the investigation and basic logic of enquiry like the experimental method. It is mostly used when it is not possible or acceptable to manipulate the characteristics of the variables under study. The choice of the *ex post facto* is based on the fact that the data is secondary and is retrieved from World Bank Data and Central Banks of the selected developing African economies sources. Secondly, the reported figures or proxies for the variables of interest are secondary data from recognized sources.

3.2 Sources and Nature of Data

The data used in this study were mainly obtained from secondary sources. The secondary data utilized in the work consist of time series annual data covering the period 1986-2016 sourced from the publications of Nairobi Stock Exchange, Nigerian Stock Exchange, Johannesburg Stock Exchange, Central Banks of Kenya, Nigeria and South Africa, Knoema and World Bank Data base respectively.

3.3 Descriptions of Variables, Sample Size and Areas of Study

The study attempts to identify the interaction between monetary policy and stock market performance in developing African economies. Thus, the population of the study is composed of three (3) developing African countries. Following the rules provided by Patton (2012) on sample selection which states that a researcher may engage in purposeful sampling for information-rich cases and need for most effective use of limited resources; the sample was drawn and all of this

stock exchange markets were in existence by 1986 which is the lower boundary of the study. The choice of 1986 is due to the fact that significant monetary policy reforms for developing economies in Africa were introduced in 1986. The choice of 2016 as the upper limit is due to non-availability of comprehensive statistical data beyond this year in statistical sources.

3.4 Model Specification and Validity

The study adopts Ogu and Pavis (2012). Their model is stated thus;

$Rt = b_0 + b_1 r0 + b_2 M2 + e$ …… (i) (Ogu & Pavis, 2012)

Where, Rt-Stock Market Returns, r0-Interbank lending interest rates, M2- Money supply

3.4.1 The Ordinary Least Square Regression models:

The OLS regression models take the form

$Y = f(X)$ …….. Functional form

$Y = b_o + b_1 X_1 + U$ ……. Mathematical form

$Log(MC) = f(log(M2))$

$Log(MC) = b_o + b_1 log(M2) + U$ …… (1)

$MC = f(TBC)$

$MC = b_o + b_1 TBC + U$…… (2)

$MC = f(CPI)$

$MC = b_o + b_1 CPI + U$ ……. (3)

$MC = f(EXR)$

$MC = b_o + b_1 EXR + U$ …….. (4)

Restatement in a multiple regression form is stated thus;

$MC = f(M2, TBC, CPI, EXR)$

$MC = b_o + b_1 M2 + b_2 TBC + b_3 CPI + b_4 EXR + U$ …….. (5)

Where Y is the dependent variable; the Xs are the independent variables; and the b_s the parameters.

MC - Market Capitalization

M2 - Money Supply

TBC - Deposit Money Banks Total Credit

CPI – Consumer Price Index

EX – Foreign Exchange Rate

The log-linear function takes the form.

$$Log_s Y = Log_e b_o + b_1 Log_e x_1 \text{ x } b_2 Log_e X_2 + \ldots\ldots + b_n Log_e X_n + U \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{(ii)}$$

The random error term, U, is added to make the model probabilities rather than deterministic. It is also known as the stochastic variable. It is assumed that for any given set of values of $x_{1,}$ $x_{2,}$ $\ldots\ldots\ldots x_{n,}$ the random error U has a normal probability distribution with mean equal to zero and variance equal to δ^2. The random errors are independent (in a probabilistic sense).

The value of the coefficients, b_i determines the contribution of the independent variable $x_{i,}$ given that the other x variables are held constant, and b_o is the Y-intercept. The coefficients, $b_{o,}$ $b_{i,}b_n$ are usually unknown because they represent population parameters. The following steps are taken in developing the model. (a) Hypothesize the form of the model including the choice of the independent variables to be included therein; (b) the random error component, U and estimate its variance, $\delta^{2;}$ (d) Check the utility of the model; and (e) Use the fitted model to estimate the mean value of Y or to predict a particular rate of Y for given values of the independent variables, where applicable.

3.4.2 The Distribution Lag Models

Distributed–Lag model with only lagged exogenous variables takes the general form

$Y_t = a + b_o x_{t-1} + b_2 x_{t-2} + \ldots\ldots + b_3 x_t - s_t..... + U_t$ …….. (iii)

Where $_{t-i}$ is the number of lags

3.4.3 Description of Variables in the Model

The Dependent Variable

Market Capitalization: this is the total value of all equity securities listed on a stock exchange and it is a function of the prevailing market price of quoted equities and the size of their issued and paid up capital. It is a summary measure of the performance of the capital market.

The Independent Variables

Money Supply: This is a core monetary policy instrument. In economics, the money supply (or money stock) is the total amount of monetary assets available in an economy at a specific time.

Deposit Monetary Banks Total Credit: Bank total credit is the aggregate amount of credit made available to persons or businesses from banking institution in a country. It is the total amount of funds financial institutions provide to individuals or businesses in a country.

Consumer Price Index: This measures changes in the price level of market basket of consumer goods and services purchased by households. The CPI is a statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically.

Foreign Exchange rate: Foreign exchange is the exchange of one currency for another by governments, businesses and residents in two different countries.

3.5 Method of Data Analysis

3.5.1 Unit Root Test Statistics

A unit root test is a statistical test for the proposition that in an autoregressive statistical model of a parameter is one. In a data series y(t), where t a whole number, modeled by: y(t+1) = ay(t) + other terms or consider a discrete time stochastic process [yt, t =1, ∞], and suppose that it can be written as an autoregressive process of order p:

$yt = a_1yt\text{-}1 + a2y_{t-2} + \ldots + a_py_{t-p} + \varepsilon t$

Here, $\{\varepsilon t, t = o, \infty\}$ is a serially uncorrelated, mean zero stochastic process with constant variance σ^2. For convenience, assume y0 = 0. If m = 1 is a root of the characteristic equation:

$M^p = m^{p-1}a_1 - m^{p=2}a_2 - \ldots a_p = 0$

Then the stochastic process has a unit root or, alternatively, is integrated of order one, denoted I(1). If m = I is a root of multiplicity r, then the stochastic process is integrated of order r, denoted I(r)

3.5.2 Cointegration Test Tool

Since the introduction of cointegration and common trend analysis in econometrics and statistics by Engle and Granger (1987) and Stock and Watson (1988), integration and cointegration tests have by now become an essential part of the applied econometricians' and macroeconomists' standard tool kit. These tests are routinely applied to economic time series because the notion of cointegration has a natural economic interpretation: existence of a cointegration relationship between two variables indicates that the series "move together" in the long run, and so they share a common stochastic trend, although in the short run the series may diverge from each other. Since many economic theories make these kinds of long-run and short-run differential predictions about economic time series co-movements, many economic models

(particularly macroeconomic models) lend themselves naturally to cointegration testing (Engle & Granger, 1987).

The cointegration property is a long-run property, and therefore in frequency domain it refers to the zero-frequency relationship of the time series. Therefore, there is a frequency-domain equivalent of the time-domain cointegration property. Specifically, existence of a cointegration relationship between two time series in the time domain imposes restrictions on the series zero-frequency behaviour in terms of their cross spectral measures in the frequency domain.Therefore, we shall employ the Johansen test for cointegration. This approach to test for cointegration is put forward by Johansen (1991).

Second- Order Test (Econometric Criteria)

Second-order econometric test conducted includes the following;

3.5.3 Autocorrelation test

This test is used to conduct autocorrelations test. Autocorrelation refers to the association that exists between error terms of various observations; this test hinges on the OLS assumption that error terms are uncorrelated. Thus, the Breusch-Godfrey Serial Correlation LM is used to perform this test.

3.5.4 Test for Model Stability (Ramsey RESET Test)

Ramsey RESET stands for regression specification error test proposed by Ramsey (1969) it is carried out to check mate; omitted variable, inappropriate functional form and measurement error, This test follows that, if the computed F value is significant (i.e. high), we accept the hypothesis that the model is mis-specified.

3.5.5 Test for Normality Distribution of Residual

This residual test is also conducted to find out the normality distribution of the disturbance term, thus, we utilize the test proposed by Jarque and Bera (1980).

3.5.6 Test for Heteroscedasticity

We test the null hypothesis of homoscedasticity against the alternative of heteroscedasticity. It follows the chi-square distribution.

3.5.7 Test for Perfect Multicollinearity

This is also known as the test for exact collinearity. It aims to identify whether the explanatory variables are highly associated, it is proposed by Ragnar Frisch (1934).

3.5.8 Causality Test

Granger causality test is used to examine the direction of causality between two variables. Causality means the impact of one variable on another. The rationale for conducting this test is that it enables one to know whether the independent variables can actually cause variations in the dependent variable or vice versa. Two variables may correlate without one causing changes in the other. Thus, Granger causality test helps in adequate specification of models.

The hypotheses tested under this technique are:

H_0: x does not Granger-cause y or y does not Granger-cause x

H_1: x Granger-causes y or y Granger-causes x

These hypotheses are tested based on the standard F-tests. The null hypothesis is rejected on the condition that the observed F-statistic exceeds the critical F-statistic. In such case, one variable is influenced by the action of another variable.

However, four possible causal relationships can ever exist between y_t and x_t. These are:

i. Unidirectional causality from y to x exists if and only if $\lambda\hat{}_j \neq 0$ (j = 1, p) and $\lambda\hat{}_i = 0$ (I = 1,q)

ii. Unidirectional causality from x to y exists if and only if $b\hat{}_j \neq 0$ (j = 1, ….. n) and $b\hat{}_i = 0$ (i = 1, …..m)

iii. Feedback or bi-directional causality between x and y exists if and only if $\lambda\hat{}_j \neq 0$ (j = 1, ….. p) and $\lambda\hat{}_i = \neq 0$ (I = 1, …..q)

iv. No causality exists between y and x if and only if $\lambda\hat{}_j = 0$ (j = 1,.p) and $\lambda\hat{}_j = 0$ (I = 1, ….q). Thus in this case y and x are not dependent on each other.

3.6 Estimation of the Model

$LogMC_{it}=\alpha_i + \beta_{1i}logM2_{it}+\beta_{2i}logDMBTC_{it}+\beta_{3i}logCPI_{it}+\beta_{4i}logEX_{it} + u_{it}$ ….(7)

Hypothesis One (Model 1)

$\log MC_t = \alpha_0 + \alpha_1 logM2_t + U_t$ ……3.1.1 (Normal/individual model)

$logMC_{it} = \alpha_0 + \beta_1 logM2_{it} + U_{it}$ ……3.1.2 (Pooled effect model)

$logMC_{it} = \alpha_0 + \beta_1 logM2_{it} + U_i + V_{it}$…3.1.3(Fixed effect model)

$logMC_{it} = \alpha_0 + \beta_1 logM2_{it} + \beta_2 logMC_{it} + GƆ_{it}$; $GƆ_{it} = €_I + V_{it}$ …. 3.1.4 (Random effect model)

Hypothesis Two (Model 2)

$\log MC_t = \alpha_0 + \alpha_1 logDMBTC_t +$ U_t ……3.3.1 (Normal/individual model)

$logMC_{it} = \alpha_0 + \beta_1 logDMBTC_{it} +$ U_{it} ……3.3.2 (Pooled effect model)

$logMC_{it} = \alpha_0 + \beta_1 logDMBTC_{it} + U_i + V_{it}$…3.3.3(Fixed effect model)

$logMC_{it} = \alpha_0 + \beta_1 logDMBTC_{it} + \beta_2 logMC_{it} + GƆ_{it}$; $GƆ_{it} = €_I + V_{it}$ …. 3.3.4 (Random effect model)

Hypothesis Three (Model 3)

$\log MC_t = \alpha_0 + \alpha_1 logCPI_t + U_t$ ……3.4.1 (Normal/individual model)

$logMC_{it} = \alpha_0 + \beta_1 logCPI_{it} + U_{it}$ ……3.4.2 (Pooled effect model)

$logMC_{it} = \alpha_0 + \beta_1 logCPI_{it} + U_i + V_{it}$…3.4.3(Fixed effect model)

$logMC_{it} = \alpha_0 + \beta_1 logCPI_{it} + \beta_2 logMC_{it} + GƆ_{it}$; $GƆ_{it} = €_I + V_{it}$ …. 3.4.4 (Random effect model)

Hypothesis Four (Model 4)

$\log MC_{t} = \alpha_0 + \alpha_1 \log EX_t + U_t$ ……3.5.1 (Normal/individual model)

$\log MC_{it} = \alpha_0 + \beta_1 \log EX_{it} + U_{it}$ ……3.5.2 (Pooled effect model)

$\log MC_{it} = \alpha_0 + \beta_1 \log EX_{it} + U_i + V_{it}$…3.5.3 (Fixed effect model)

$\log MC_{it} = \alpha_0 + \beta_1 \log EX_{it} + \beta_2 \log MC_{it} + \text{Ↄ}_{it}$; $\text{Ↄ}_{it} = €_I + V_{it}$ …. 3.5.4 (Random effect model)

Hypothesis Five (Model 5)

$\log MC_{t} = \sum\alpha_1 \log M2_t + \sum\alpha_2 \log DMBTC_{1-t} + \sum\alpha_3 \log CPI_{1-t} + \sum\alpha_4 \log EX_{1-t} + U_t$ ……3.8

Granger Causality Tests on Stock market development parameter as proxy by Market capitalization and monetary policy variables.

Where;

α_0 = Intercept term**;**
β = Vector of parameters to be estimated on the explanatory variables
Ↄ = Composite error term;
μ = error term
$€_I$ = New cross-sectional error term;
V_{it} = Individual observation error term
It = Panel data variables

3.7 A Priori Expectation

The theoretical relationship between the dependent and independent variables is adjudged by the a priori expectation. On the assumption of the Tobin's theory of monetary policy; money supply, exchange rate, CPI and DMBTC will be positive related with stock market performance in market capitalization. The supposed signs of the independent variables are summarized in Table 3.1.

Table 3.1: A Priori Expectation

Symbol	Variable	Substitution	Supposed Signs
M2	Money Supply	Monetary Policy	+
DMBTC	Deposit Money Bank Total Credit	Monetary Policy	+
CPI	Consumer Price Index	Monetary Policy	+
EX	Exchange Rate	Monetary Policy	+

Source: Researcher's Assumption from Tobin's Theory of Monetary Policy

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

This chapter presents the datasets collected and collated from the World Bank statistical database, International Monetary Fund (IMF), National Bureau of Statistics and the statistical bulletins of Central banks of Nigeria, South Africa and Kenya for the periods under study (1986-2016).

The datasets are presented in tabular forms for the purposes of clarity. In addition, the results of various econometric and statistical methods of estimations adopted in line with the objectives and aforementioned methodology of this work are also contained in this chapter. The tests of the formulated equations and hypotheses are also presented with conclusions drawn against the backdrop of the formulated models and apriori expectations. The various diagnostic, standard and validity tests conducted are shown with the main aim of vouching for the reliability of the used datasets and estimated models.

4.2.0 **Data Presentation**

Table 4.1 Nigeria's Selected Monetary policy instruments and Stock market development data between 1986–2016

Year	MC'$	EX	CPI	TBC'$	M2'$
1986	**3,883,000,000**	2.0206	0.9	54,578,577,000	11,781,846,976
1987	**2,065,000,000**	4.0179	1	36,927,000,000	6,862,685,317
1988	**2,207,000,000**	4.5367	1.5	39,161,339,000	8,454,779,906
1989	**1,746,000,000**	7.3916	2.3	25,382,883,000	6,210,141,692
1990	**1,370,000,000**	8.0378	2.4	39,577,680,000	6,576,056,259
1991	**1,880,000,000**	9.9095	2.8	40,589,850,000	7,608,978,758
1992	**1,220,000,000**	17.2984	4	33,161,880,000	6,423,271,188
1993	**2,143,000,000**	22.0511	6.3	80,434,480,000	7,497,981,916
1994	**2,977,000,000**	21.9	9.8	97,481,760,000	10,515,643,623
1995	**7,777,000,000**	70.4	17	51,563,640,000	4,106,407,220
1996	**12,714,000,000**	69.8	21.9	30,788,170,000	4,954,927,837
1997	**12,559,000,000**	71.8	23.8	30,523,500,000	5,755,990,651
1998	**10,322,000,000**	76.8	26.2	45,680,180,000	6,356,064,924
1999	**2,940,000,000**	92.3	27.9	48,926,560,000	6,814,216,256

2000	**2,401,000,000**	101.7	29.9	27,645,000,000	8,637,731,306
2001	**2,396,000,000**	111.9	35.5	58,208,800,000	11,343,356,677
2002	**2,374,000,000**	121	40.1	68,435,250,000	12,445,979,339
2003	**9,493,000,000**	129.4	45.7	83,095,520,000	15,092,126,696
2004	**15,866,000,000**	133.5	52.6	52,041,600,000	15,968,681,511
2005	**22,244,000,000**	132.15	61.9	42,250,080,000	19,961,503,826
2006	**32,831,000,000**	128.65	67	26,481,560,000	29,521,251,267
2007	**84,895,000,000**	125.83	70.7	114,321,000,000	40,748,634,684
2008	**48,062,000,000**	118.53	78.8	173,115,000,000	67,562,675,694
2009	**32,223,000,000**	148.9	87.9	266,699,000,000	63,204,246,131
2010	**50,546,000,000**	149.74	100	150,435,000,000	73,684,009,149
2011	**39,028,000,000**	153.85	110.8	189,313,000,000	79,119,208,860
2012	**56,205,000,000**	157.5	124.4	189,224,000,000	88,224,692,873
2013	**80,610,000,000**	157.31	134.9	213,370,000,000	96,372,067,003
2014	**63,466,000,000**	158.55	145.8	229,840,000,000	111,506,000,000
2015	**49,974,000,000**	196.49	158.9	252,696,000,000	96,194,732,607
2016	**29,792,000,000**	253.5	183.9	280,446,000,000	85,237,403,069

Source*: World Bank data 2017; Nigeria Stock Exchange, 2017; National Bureau of Statistics, 2017; Knoema; Index Mundi (Standard and Poor's, Global stock market fact-book and Supplemental, International Monetary Fund, International Financial Statistics),2016.*

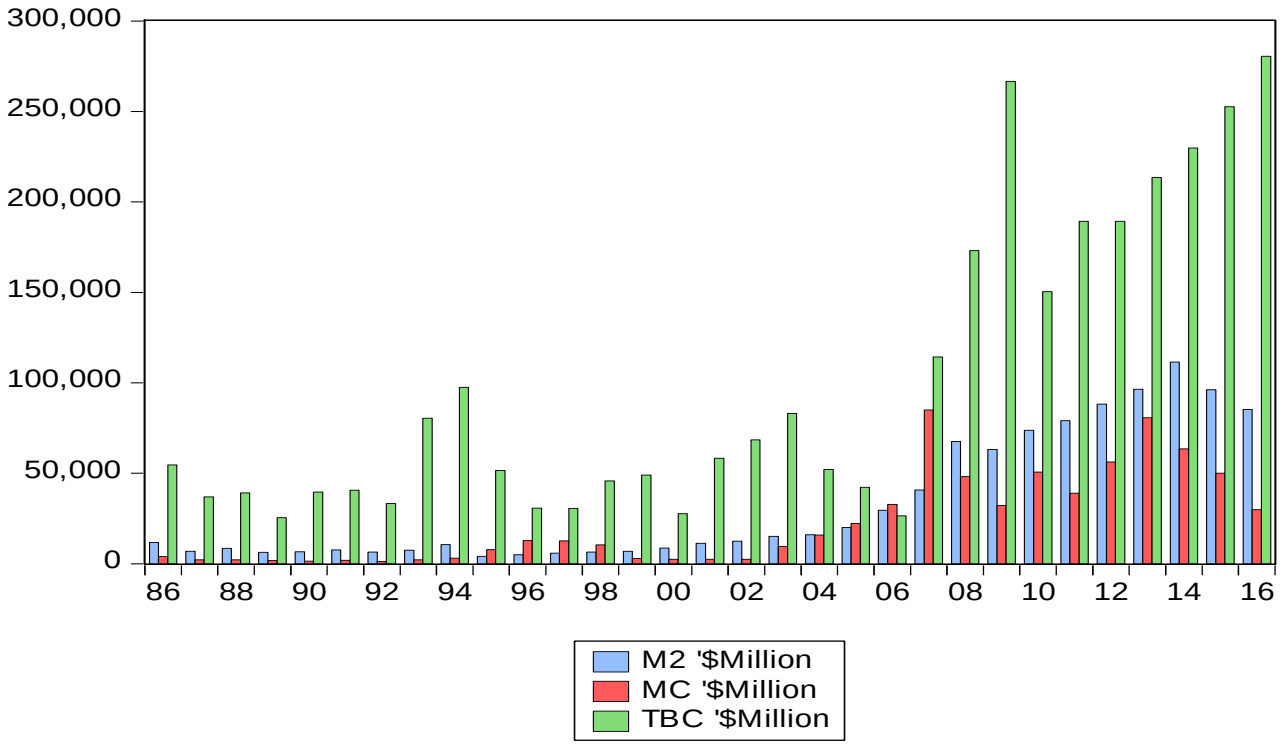


Figure 4.1: Nigerian monetary policy instruments and market capitalization

Analyses:

Table 4.1 and Figure 4.1 shows trend in the various variables used to measure money supply (M2), foreign exchange rate (EX), consumer price index (CPI), total bank credit (TBC) and market capitalization (MC) for Nigeria from 1986 to 2016 (a 31 year period).

The table 4.1 shows that the MC started from a high level of $3.883 billion in 1986 with a corresponding high TBC and M2 of $54.578 billion and$11.781 billion correspondingly which however fell accordingly and across the variables mentioned by 1992 to $1.220 billion, $33.161 billion and $6.423 billion for MC, TBC and M2 respectively. This shows a massive fall in market capitalization and the monetary policy instrument of money supply and the controlled total bank credit in Nigeria. Within the same period, EX all fell from 2.0206 to a dollar in 1986 to and 17.2984 to a dollar in 1992 showing that foreign exchange rate worsened alongside M2 and TBC. However, the CPI appreciated from 0.9 in 1986 to 4 in 1992 showing the average dollar level in a year.

Thus, stock market performance show a direct relation with all the monetary instruments within 1986 to 1992 and an inverse relation to CPI within the same period which is in line with our aprior expectation and findings of some of the reviewed literature.

Table 4.1, shows that from 1993 to 2007, the MC had increased and fall repeatedly as a result of key monetary policies that trigger actions in the stock market both in 1998 where it peaked and fell in 1999 due to democratic transition and 2003 due to recapitalization process. By 2008, the market capitalization (MC) had moved down to $48.062billion, showing decline in capitalization in the Nigerian stock market without a corresponding decline in M2 and TBC. Similarly, the stock market performance parameter showed upward (growth)and downward (decline) movement between 2009 to the end of the study period however, the same reactions

were experienced in M2 and TBC within the same period. It will be observed that market capitalization (MC) that did not show growth sign in the short-run at the beginning of the study period but had adjusted and now shows growth trend alongside M2 and TBC, however they all had continued to grow and fall though sharply but intermittently unconventionally.

The graphical illustration was also done to stress the flow of events within the period under review.

Table 4.2: South Africa's selected Monetary Policy instruments and Stock market Development between 1986 –2016

Year	MC	EX	CPI	TBC	M2
1986	**102,652,000,000**	104.3	13.8	174,215,000,000	730,220,038.40
1987	**138,788,000,000**	117.7	16.1	179,643,000,000	773,417,587.10
1988	**126,189,000,000**	111.2	18.1	195,874,000,000	1,039,784,173
1989	**145,438,000,000**	111.6	20.8	206,542,000,000	1,249,169,803
1990	**136,869,000,000**	114.7	23.7	223,159,000,000	1,359,485,179
1991	**184,705,000,000**	119.4	27.4	279,752,000,000	1,529,438,861
1992	**164,046,000,000**	123.4	31.2	280,019,000,000	1,522,204,214
1993	**217,098,000,000**	121.1	34.2	312,949,000,000	1,648,986,788
1994	**259,523,000,000**	115.9	37.3	346,792,000,000	2,038,550,475
1995	**277,389,000,000**	112.7	40.5	376,147,000,000	2,432,519,965
1996	**241,571,000,000**	103.7	43.5	400,090,000,000	3,021,118,611
1997	**230,039,000,000**	109.5	47.2	413,413,000,000	3,370,748,858
1998	**168,536,000,000**	100.6	50.5	423,492,000,000	4,169,877,038
1999	**259,739,000,000**	95.1	53.1	484,908,000,000	4,892,160,042
2000	**204,301,000,000**	92.1	55.9	513,517,000,000	5,415,983,388
2001	**147,472,000,000**	81.3	59.1	652,124,000,000	7,374,189,545
2002	**181,998,000,000**	69.4	64.5	593,500,000,000	10,218,318,084
2003	**260,748,000,000**	90.2	68.3	642,046,000,000	8,911,610,166
2004	**442,520,000,000**	97.6	69.3	725,564,000,000	9,319,207,131
2005	**549,310,000,000**	98.9	71.6	835,295,000,000	11,100,194,408
2006	**711,232,000,000**	94.9	75	982,174,000,000	14,185,107,661
2007	**828,185,000,000**	89.3	80.3	1,063,450,000,000	18,682,191,800
2008	**482,700,000,000**	79.4	89.5	974,911,000,000	24,108,315,504
2009	**799,024,000,000**	86.6	95.9	1,044,970,000,000	22,493,198,185
2010	**925,007,000,000**	100	100	1,114,540,000,000	20,829,796,911
2011	**789,037,000,000**	97.9	105	1,086,230,000,000	23,051,347,844
2012	**907,723,000,000**	92.6	110.9	1,194,670,000,000	25,631,088,386
2013	**942,812,000,000**	82.8	117.3	1,249,000,000,000	30,360,693,764

2014	**933,931,000,000**	77.6	124.4	1,315,710,000,000	34,753,375,983
2015	**735,945,000,000**	77.2	130.1	1,281,640,000,000	38,539,850,367
2016	**826,354,000,000**	71.5	138.4	1,340,570,000,000	44,142,053,992

Source*: World Bank data 2017; Nigeria Stock Exchange,2017; National Bureau of Statistics,2017; Knoema; Index Mundi (Standard and Poor's, Global stock market fact-book and Supplemental, International Monetary Fund, International Financial Statistics),2016.*

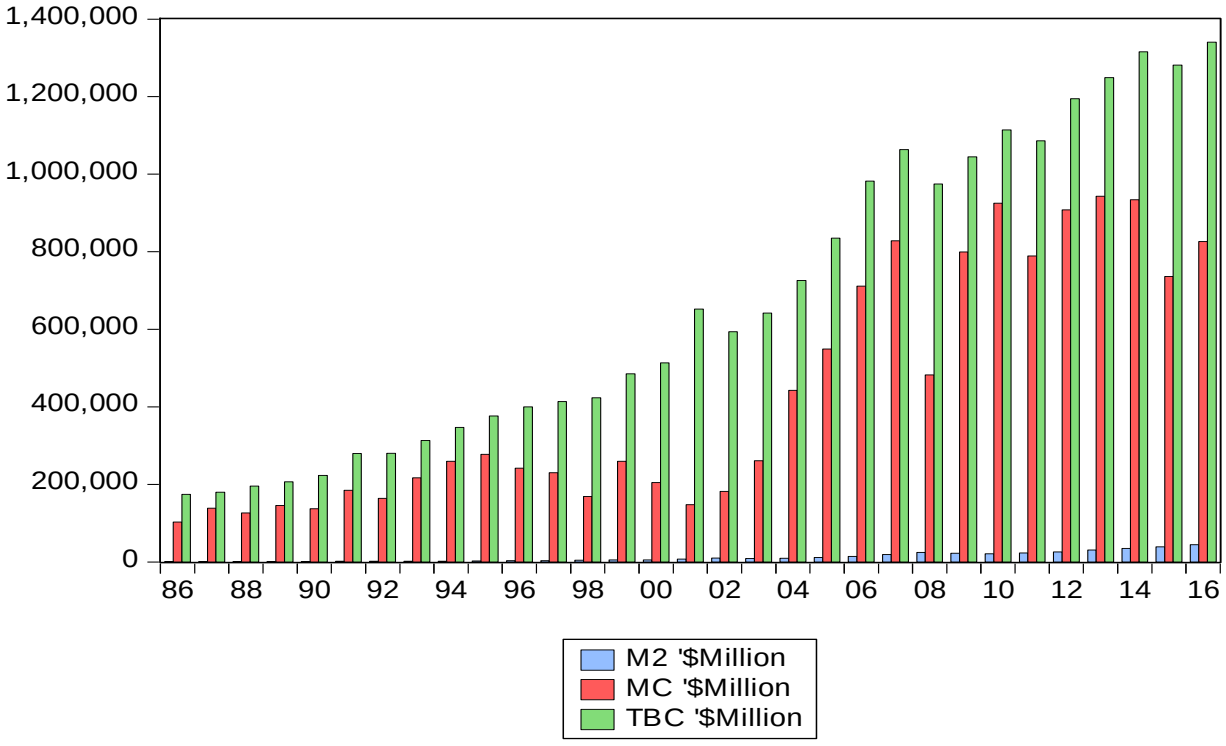


Figure 4.2: South Africa monetary policy instruments and market capitalization

Analyses:

Table 4.2 and Figure 4.2 shows trend in the various variables for the country of SOUTH AFRICA used to measure market capitalization (MC), money supply (M2), foreign exchange rate (EX), consumer price index (CPI) and total bank credit (TBC) from 1986 to 2016.

The table 4.2 shows that the MC started from a very high level of $102.652 billion in 1986 with a corresponding high TBC and M2 of $174.215 billion and $730.220 million have grown over the period to $259.739 billion, $484.908 billion and $4.892 billion respectively. The EX in 1986 at 104.3 to a US dollar however fell by 1999 to 95.1 to a dollar showing that the EX

appreciated between 1986 and 1999. The CPI also showed appreciation from 1986 in 13.8 to 53.1 in 1999.This shows a massive growth in market capitalization (MC), money supply (M2), foreign exchange rate (EX), consumer price index (CPI) and total bank credit (TBC) from 1986 to 1999. From 2000 to 2016, the market capitalization (MC), money supply (M2), foreign exchange rate (EX), consumer price index (CPI) and total bank credit (TBC) have all appreciated showing that the money supply, exchange rate, consumer price index and total bank credit had all in tandem with market capitalization within the period. This trend is consistent with our aprior expectation and findings of some of the reviewed literature.

The graphical illustration was also done to stress the flow of events within the period under review.

Table 4.3: Kenya's selected Monetary Policy instruments and Stock market Development data between 1986 –2016

Year	MC	EX	CPI	TBC	M2
1986	**306,000,000**	16.2	5.3	5,116,430,000	2,203,327,160
1987	**352,000,000**	16.5	5.8	5,293,680,000	2,404,042,424
1988	**390,000,000**	17.7	6.5	5,970,510,000	2,421,220,339
1989	**424,000,000**	20.6	7.4	6,589,440,000	2,349,169,903
1990	**453,000,000**	22.9	8.7	6,930,220,000	2,537,082,969
1991	**453,000,000**	27.5	10.4	7,760,000,000	2,526,210,909
1992	**637,000,000**	32.2	13.3	8,715,720,000	2,999,357,143
1993	**106,000,000**	58	19.4	7,427,750,000	2,131,962,069
1994	**3,047,000,000**	56.1	24.9	8,345,700,000	2,715,046,702
1995	**2,018,000,000**	51.4	25.3	11,542,920,000	3,822,683,716
1996	**1,799,000,000**	57.1	27.6	10,300,990,000	4,312,541,489
1997	**1,813,000,000**	58.7	30.7	11,829,120,000	5,042,158,313
1998	**2,089,000,000**	60.4	32.8	12,112,800,000	5,043,881,722
1999	**1,409,000,000**	70.3	34.6	13,930,420,000	4,614,726,159
2000	**1,255,000,000**	76.2	38.1	13,867,500,000	4,466,367,686
2001	**1,045,000,000**	78.6	40.3	14,404,320,000	4,574,217,176
2002	**1,431,000,000**	78.7	41.1	15,104,880,000	5,020,165,947
2003	**4,183,000,000**	75.9	45.1	15,429,960,000	5,818,934,783
2004	**3,891,000,000**	79.2	50.3	17,971,590,000	6,327,723,737
2005	**6,384,000,000**	75.6	55.5	18,883,400,000	7,285,874,206
2006	**11,378,000,000**	72.1	63.6	17,939,860,000	8,936,135,922
2007	**13,345,000,000**	67.3	69.8	19,763,900,000	11,528,679,643

2008	**10,854,000,000**	69.2	88.1	22,306,280,000	12,955,498,336
2009	**10,967,000,000**	77.4	96.2	22,852,500,000	13,489,195,818
2010	**14,461,000,000**	79.2	100	27,284,320,000	16,130,478,500
2011	**10,203,000,000**	88.8	114	33,240,780,000	17,141,980,646
2012	**14,791,000,000**	84.5	124.7	34,125,600,000	20,606,969,851
2013	**22,256,000,000**	86.1	131.8	39,453,820,000	23,313,922,648
2014	**16,140,000,000**	87.9	140.9	45,516,680,000	26,580,101,337
2015	**18,204,000,000**	98.2	150.2	49,492,610,000	27,155,813,961
2016	**14,342,000,000**	99.8	159.6	50,609,900,000	27,700,468,664

Source*: World Bank data 2017; Nigeria Stock Exchange, 2017; National Bureau of Statistics, 2017; Knoema; Index Mundi (Standard and Poor's, Global stock market fact-book and Supplemental, International Monetary Fund, International Financial Statistics),2016.*

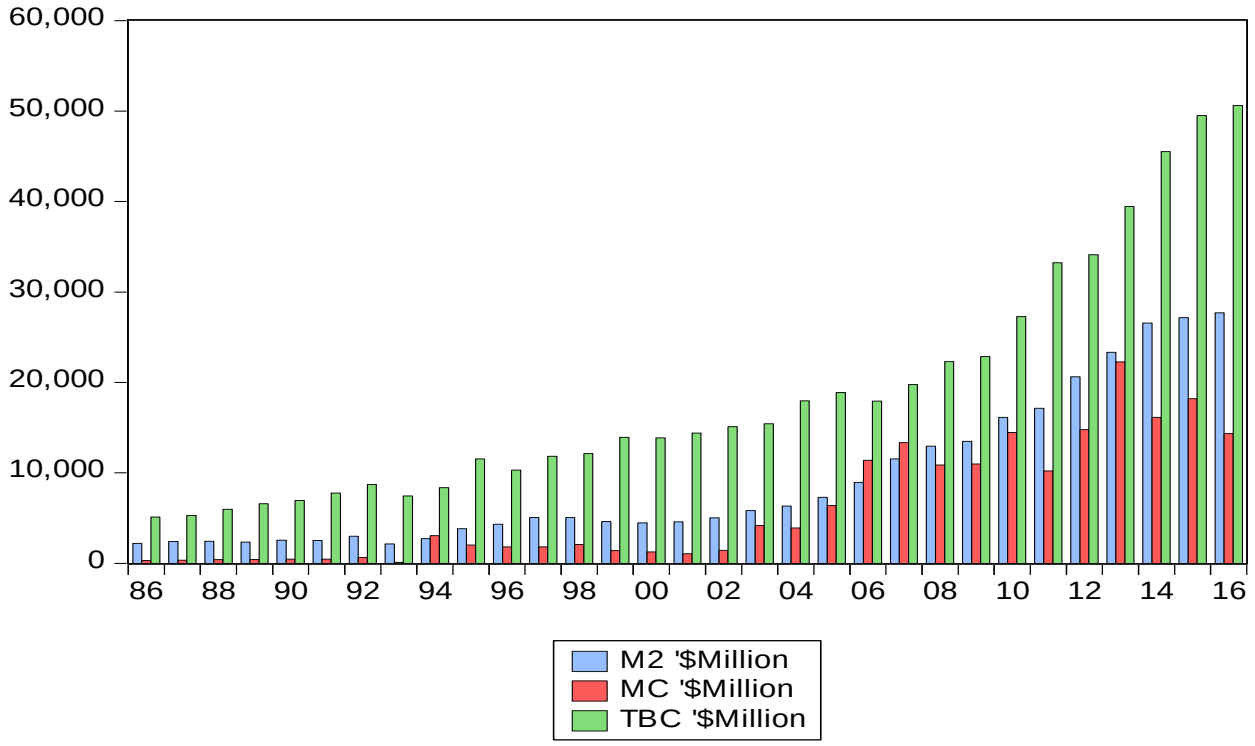


Figure 4.3: Kenya monetary policy instruments and market capitalization

Analyses:

Table 4.3 and figure 4.3 shows trend in the selected variables for KENYA used to measure market capitalization (MC), money supply (M2), foreign exchange rate (EX), consumer price index (CPI) and total bank credit (TBC) from 1986 to 2016.

The table 4.3 shows that the MC started from a very low level of $306 million in 1986 with a corresponding TBC and M2 of $5.116 billion and $2.203 billion respectively. However,

the MC of Kenya grew massively to $3.047 billion in 1994. Within the same period, TBC rose and fell severally but was $8.345 billion as at 1994. The M2 was however indifferent as they were no major fluctuation in the figures for the periods. The Kenyan foreign exchange rate of 16.2 to a US dollar however fell rapidly and continuously till 1994 while the CPI however showed growth and improvement within the same period from 5.3 to 24.9. Thus, in the short period, the MC tends to show an inverse relationship to foreign exchange rate (EX) while other variables including money supply (M2), consumer price index (CPI) and total bank credit (TBC) have direct relationship, which is consistent with our aprior expectation.

Table 4.3 also shows that from 1999 to 2016, the market capitalization (MC) had appreciated and fallen repeatedly over the period. However, it peaked at all high $22,256 billion in 2013. The TBC and M2 however appreciated continuously from 1999 to 2016 with the highest value been $50.609 billion and $27.700 billion respectively in 2016. Within the same period, the foreign exchange rate (EX) continues to fall to the US dollar while the CPI rose continuously till the end of the study period.

The graphical illustration was also done to stress the flow of events within the period under review.

4.3 Data Analysis

4.2.1: Descriptive Statistics and Test for Normality

The descriptive statistics will be done using the Jarque-Bera Normality test, which requires that for a series to be normally distributed; the histogram should be bell-shaped and the Jarque-Bera statistics would not be significant. This implies that the p-value given at the bottom of the normality test table should be greater than the chosen level of significance to accept the Null hypothesis, that the series is normally distributed (Brooks, 2014).

Table 4.4A: Descriptive Statistics for Nigeria Data

	CPI	EX	M2	MC	TBC
Mean	54.08387	95.37947	3.27E+10	2.22E+10	9.91E+10
Median	35.50000	111.9000	1.18E+10	1.03E+10	5.46E+10
Maximum	183.9000	253.5000	1.12E+11	8.49E+10	2.80E+11
Minimum	0.900000	2.020600	4.11E+09	1.22E+09	2.54E+10
Std. Dev.	53.05535	66.00589	3.54E+10	2.51E+10	8.20E+10
Skewness	0.901212	0.100979	0.973130	1.097853	0.997595
Kurtosis	2.715688	2.347494	2.305581	3.062878	2.517680
Jarque-Bera	4.300688	0.602629	5.515603	6.232398	5.442328
Probability	0.116444	0.739845	0.063431	0.044325	0.065798
Sum	1676.600	2956.764	1.01E+12	6.88E+11	3.07E+12
Sum Sq. Dev.	84446.10	130703.3	3.76E+22	1.89E+22	2.02E+23
Observations	31	31	31	31	31

Source: Computation by researcher using E-view 9.5

The descriptive statistics in table 4.4A shows the basic aggregative averages like mean, median and mode for all the observations. The spread and variations in the series are also indicated using the standard deviation. Significantly, kurtosis which shows the degree of peakedness is also shown together with the skewness which is a reflection of the degree of or departure from symmetry of the given series. With all the variables showing an average kurtosis less than 3, there is evidence that they are all leptokurtic with about half of the variables showing Jarque-Bera statistics of p-values below the 5% level of significance, indicates a normal distribution.

Table 4.4B: Descriptive Statistics for South Africa Data

	CPI	EX	M2	MC	TBC
Mean	64.93226	98.07097	1.22E+10	4.30E+11	6.74E+11
Median	59.10000	97.90000	7.37E+09	2.60E+11	5.94E+11
Maximum	138.4000	123.4000	4.41E+10	9.43E+11	1.34E+12
Minimum	13.80000	69.40000	7.30E+08	1.03E+11	1.74E+11
Std. Dev.	36.41235	15.26303	1.26E+10	3.07E+11	3.98E+11
Skewness	0.417967	-0.115207	1.018672	0.572798	0.318016
Kurtosis	2.088919	2.017270	2.919305	1.627341	1.614650
Jarque-Bera	1.974772	1.316013	5.369821	4.128917	3.001485
Probability	0.372549	0.517883	0.068227	0.126887	0.222965
Sum	2012.900	3040.200	3.79E+11	1.33E+13	2.09E+13
Sum Sq. Dev.	39775.77	6988.804	4.75E+21	2.83E+24	4.75E+24
Observations	31	31	31	31	31

Source: Computation by researcher using E-view 9.5

The descriptive statistics for South Africa indicates that all the variables show an average kurtosis less than 3, indicating a leptokurtic characteristics thereby the showing the absence of

platykurtic characteristics. The variables that show Jarque-Bera statistics of p-values in excess of the 5% level of significance, indicating an out-linear in distribution will be corrected through either data differencing, log transformation or addition of dummy variables or even dropping of variables in the models to improve our R^2; while only M2 is normally distributed.

Table 4.4C: Descriptive Statistics for Kenya Data

	CPI	EX	M2	TBC	MC
Mean	56.83871	62.59032	9.17E+09	1.87E+10	6.14E+09
Median	40.30000	70.30000	5.04E+09	1.44E+10	2.09E+09
Maximum	159.6000	99.80000	2.77E+10	5.06E+10	2.23E+10
Minimum	5.300000	16.20000	2.13E+09	5.12E+09	1.06E+08
Std. Dev.	47.65432	25.21282	8.26E+09	1.32E+10	6.60E+09
Skewness	0.806027	-0.664175	1.158226	1.175353	0.846238
Kurtosis	2.361919	2.264648	2.969735	3.322534	2.372634
Jarque-Bera	3.882578	2.977620	6.932205	7.271887	4.208333
Probability	0.143519	0.225641	0.031239	0.026359	0.121947
Sum	1762.000	1940.300	2.84E+11	5.80E+11	1.90E+11
Sum Sq. Dev.	68128.03	19070.59	2.05E+21	5.24E+21	1.31E+21
Observations	31	31	31	31	31

Source: Computation by researcher using E-view 9.5

The descriptive statistics for Kenya in table 4.4C reveals the skewness as a swing between positive and negative signs and the Kurtosis between leptokurtic (MC, CPI, EX and M2) and platykurtic (TBC). The Jarque-Bera statistics p-values for most of the data are insignificant being above the 5% threshold, indicating an out-linear in the data distribution. This observed out-linear will be corrected either through data differencing, log transformation or addition of dummy variables or even dropping of variables in the models to improve our R^2. The testing of single dependent variable against single independent variable will greatly assist to cure this defect.

Table 4.4D: Panel Descriptive Statistics

	CPI	EX	M2	MC	TBC
Mean	58.61828	85.34692	1.80E+10	1.53E+11	2.64E+11
Median	45.70000	86.10000	7.61E+09	1.59E+10	5.46E+10
Maximum	183.9000	253.5000	1.12E+11	9.43E+11	1.34E+12
Minimum	0.900000	2.020600	7.30E+08	1.06E+08	5.12E+09
Std. Dev.	45.95855	44.34985	2.44E+10	2.64E+11	3.74E+11
Skewness	0.719112	0.395796	2.226259	1.971859	1.646174
Kurtosis	2.539011	4.374334	7.266511	5.580105	4.472749
Jarque-Bera	8.838874	9.747225	147.3586	86.06317	50.40813
Probability	0.012041	0.007646	0.000000	0.000000	0.000000
Sum	5451.500	7937.264	1.68E+12	1.42E+13	2.46E+13
Sum Sq. Dev.	194321.3	180955.6	5.46E+22	6.43E+24	1.29E+25
Observations	93	93	93	93	93

Source: Computation by researcher using E-view 9.5

The mean and median as well as the standard deviation for the panel data in table 4.4D, for the study area shows even spread and variations for the series. The panel mean, median, maximum and Standard Deviation for the entire variables show positive and healthy trend. Significantly, kurtosis which shows the degree of peakedness is also shown along with the skewness which is a reflection of the degree or departure from symmetry of the given series. With all the variables having kurtosis above 3, there is strong evidence to believe they are platykurtic. The Jarque-Bera and the probability of the pooled panel data show strong sign of normality considering the spread among the variables and a significant p-value of 0.00 which is less than the chosen significant level of 5%. The implication of this is that the observed out-linear in the individual country descriptive statistics (Nigeria, Kenya and South-Africa) have been corrected through the panel pool effect and the result from such a process can be adequately relied upon.

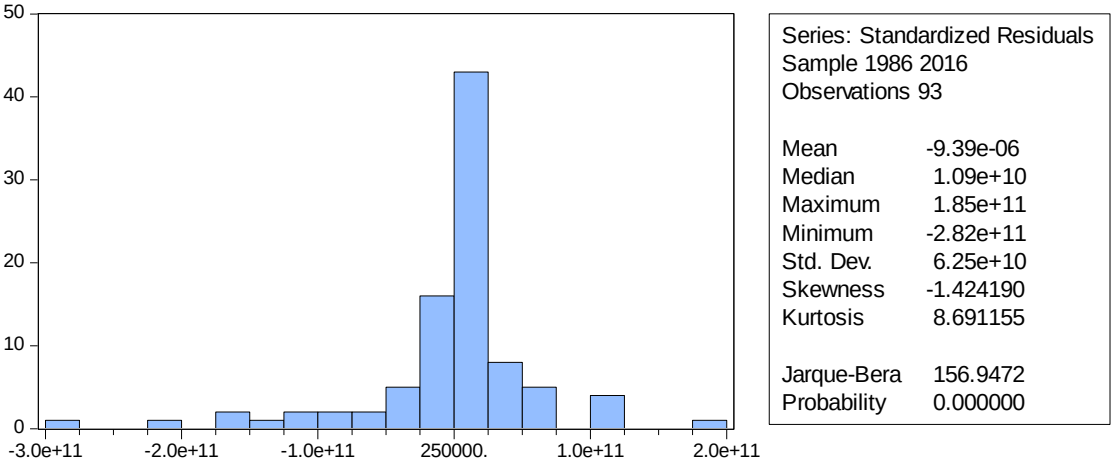
Table 4.5: Panel Covariance Matrix

	CPI	EX	M2	MC	TBC
CPI	2089.476547577755	1236.630196723321	808570246796.1744	4544970862955.256	7293086172228.305
EX	1236.630196723321	1945.759381861196	666543812960.2735	1404483888678.079	2928676659085.056
M2	808570246796.1744	666543812960.2735	5.868513679420795e+20	6.105235057788976e+20	1.552065819895347e+21
MC	4544970862955.256	1404483888678.079	6.105235057788976e+20	6.910707453938605e+22	9.479465868917306e+22
TBC	7293086172228.305	2928676659085.056	1.552065819895347e+21	9.479465868917306e+22	1.385756478767207e+23

Source: Computation by researcher using E-view 9.5

From table 4.5, covariance matrix table, the result indicates significant covariance between MC and CPI, EX at a range of over 100%. Similarly, significant covariance is observed between CPI, EX and M2, MC and TBC. Hence, any suspicion of possible multicollinearity could be dealt with by dropping variable TBC, but that is considered unnecessary because of the model structures of the hypothesis.

Figure 4.4 - Panel Data Test for Normality



Source: Computation by researcher using E-view 9.5

The histogram in figure 4.1, shows a bell-shape but the Jarque-Bera and the p-value of the panel series is significant at the 5% level of significance showing strong Normality in the distribution.

4.2.2: **Diagnostic Tests**

Diagnostic test is carried to ensure that our data and model used in this research work conforms to the basic assumptions of the classical linear regression which will ensure that the output of this process is not error prone and is reliable.

4.2.2.1: Test for Stationarity

The test for stationarity requires that the variables in the series model must be stationery at a given level and p-value must be significant at that level. Stationerity is attained where the test statistics is most negative and less than the critical value of the chosen level of significance.

Table 4.6A: Unit Root Tests for Nigeria Data

Variables	ADF Test Statistics	Critical Values @5%	P-value	Order of Integration
CPI	-3.774813	-3.580623	0.0334	**I(2)**
EX	-3.286479	-2.967767	0.0250	**I(1)**
M2	-4.128074	-3.574244	0.0151	**I(1)**
TBC	-6.144849	-3.574244	0.0001	**I(1)**
MC	-5.592662	-3.574244	0.0005	**I(1)**

Source: Researcher's E-view 9.5 Computation

Table 4.6A reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order one (1) except CPI was stantionary at order 2. At both the First and Second difference as reported, the ADF Statistics for all the respective variables were all negative as the critical values at 5% significance level. The reported P values were all less than 0.05 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that the variables are almost integrated of the same order.

Table 4.6B: Unit Root Tests for South Africa Data

Variables	ADF Test Statistics	Critical Values @5%	P-value	Order of Integration
CPI	-3.732206	-3.580623	0.0366	**I(1)**
EX	-4.887752	-3.574244	0.0026	**I(1)**
M2	-4.181972	-3.574244	0.0138	**I(1)**
TBC	-6.092162	-3.574244	0.0001	**I(1)**
MC	-6.606772	-3.574244	0.0000	**I(1)**

Source: Researcher's E-view 9.5 Computation

Table 4.6B reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order one (1). At the First difference as reported, the ADF Statistics for all the respective variables were all negative as the critical values at 5% significance level. The reported P values were all less than 0.05 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that the variables are almost integrated of the same order.

Table 4.6C: Unit Root Tests for Kenya Data

Variables	ADF Test Statistics	Critical Values @5%	P-value	Order of Integration
CPI	-4.720507	-3.574244	0.0038	**I(1)**
EX	-5.189037	-3.574244	0.0012	**I(1)**
M2	-4.009993	-3.574244	0.0197	**I(1)**
TBC	-5.114428	-3.574244	0.0015	**I(1)**
MC	-6.755762	-3.574244	0.0000	**I(1)**

Source: Researcher's E-view 9.5 Computation

Table 4.6C reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order One (1). At levels as reported, the ADF Statistics for the respective variables were all negative as the critical values at 5% significance level. The reported P values were all less than 0.05 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that almost all the variables are integrated of the same order.

Table 4.6D: Panel Unit Root Result

Variables	LLandC Test Statistics	Critical Values @5%	P-value	Order of Integration
CPI	-1.45701	-0.686	0.0326	**I(1)**
EX	-2.66586	-0.686	0.0038	**I(1)**
M2	-2.71345	-0.686	0.0033	**I(1)**
TBC	-3.16191	-0.686	0.0008	**I(1)**
MC	-2.07412	-0.686	0.0190	**I(1)**

Source: Researcher's E-view 9.5 Computation

The Table 4.6D shows the stationarity tests for the panel data series following the Levin, Lin and Chu (LLC) statistics. All the panel variables were found to be stationery at first difference level (1). At first difference levels as reported, the variable p-value were all less than the 5% chosen significance level and thus we reject the Null hypothesis of the presence of Unit root and accept the alternative that there is no unit root and stationarity is attained by all the variables at the first difference levels.

4.2.2.2: Test for Multicollinearity

Table 4.7A: Correlation Matrix for Nigeria

	CPI	EX	M2	MC	TBC
CPI	1	0.9168692225877772	0.941368986221196	0.7896657698032554	0.8890418572155135
EX	0.9168692225877772	1	0.7606722900874819	0.6637463351382434	0.7386897776390184
2	0.941368986221196	0.7606722900874819	1	0.8436155799274154	0.9215811362037469
MC	0.7896657698032554	0.6637463351382434	0.8436155799274154	1	0.703907352462492
TBC	0.8890418572155135	0.7386897776390184	0.9215811362037469	0.703907352462492	1

Source: Computation by researcher using E-view 9.5

From the correlation matrix table 4.7A, the result indicates significant correlation between CPI, EX, M2, TBC and MC at 0.789666, 0.663746, 0.843616 and 0.703907 respectively. Hence, there is no suspicion of possible multicollinearity and the approach would drop no variable in the study as it will be considered unnecessary (Brooks, 2014).

Table 4.7B: Correlation Matrix for South Africa

	CPI	EX	M2	MC	TBC
CPI	1	-0.7840000247594244	0.9640777019465349	0.8985407158273649	0.9814884250959062
EX	-0.7840000247594244	1	-0.7602019370875258	-0.5533322543518373	-0.7631081576000299
M2	0.9640777019465349	-0.7602019370875258	1	0.8774193753038352	0.9483959996809732
MC	0.8985407158273649	-0.5533322543518373	0.8774193753038352	1	0.9440686850063388
TBC	0.9814884250959062	-0.7631081576000299	0.9483959996809732	0.9440686850063388	1

Source: Computation by researcher using E-view 9.5

The result from table 4.7B reveals significant correlation between CPI, EX, M2, TBC and MC at 0.898541, -0.55333, 0.877419 and 0.944069 respectively. None are considered insignificant as they were above 50%. Hence, there is no suspicion of possible multicollinearity and the approach would drop no variable in the study as it will be considered unnecessary (Brooks, 2014).

Table 4.7C: Correlation Matrix for Kenya

	CPI	EX	M2	MC	TBC
CPI	1	0.8161225260756015	0.9837425823700908	0.931967301516965	0.9825175902665959
EX	0.8161225260756015	1	0.7227874029666519	0.6888174060462662	0.788621460715419
M2	0.9837425823700908	0.7227874029666519	1	0.9309441419783184	0.9870282715967062
MC	0.931967301516965	0.6888174060462662	0.9309441419783184	1	0.8942930150553804
TBC	0.9825175902665959	0.788621460715419	0.9870282715967062	0.8942930150553804	1

Source: Computation by researcher using E-view 9.5

From table 4.7C, the observed possible correlation matrix indicates significant correlation between CPI, EX, M2, TBC and MC at 0.931967, 0.688817, 0.930944 and 0.894293 respectively. Hence, there is no suspicion of possible multicollinearity and the approach would drop no variable in the study as it will be considered unnecessary (Brooks, 2014).

Table 4.7D: Panel Correlation Matrix

	CPI	EX	M2	MC	TBC
CPI	1	0.6133050349757671	0.7301884268833062	0.3782257550748767	0.4285970087603394
EX	0.6133050349757671	1	0.6237636669538505	0.1211186274681713	0.1783542245233546
M2	0.7301884268833062	0.6237636669538505	1	0.09586875212522302	0.1721086172265728
MC	0.3782257550748767	0.1211186274681713	0.09586875212522302	1	0.9686773701149934
TBC	0.4285970087603394	0.1783542245233546	0.1721086172265728	0.9686773701149934	1

Source: Computation by researcher using E-view 9.5

Table 4.7D, shows a positive panel correlation of a maximum of 37.82%, 12.11% and 9.59% between CPI, EX, M2 and MC. This implies that changes in CPI, EX, M2 could result to positive changes in MC.

4.2.2.3: Test for Ramsey Reset Specification

Ramsey (1969) proposed a general functional form misspecification test, Regression Specification Error Test (RESET), which has proven to be useful. The Reset test is a general test for the following type of specification errors:

a) Omitted Variables

b) Incorrect Functional form

c) Correlation between variables which may be caused by measurement error, simultaneous equation combination, combination of lagged values and serially correlated disturbances.

The Reset test is a non-linearity test, or a misspecification of functional form that is a situation where the shape of the regression model estimated is incorrect – for instance, where the model estimated is linear but it should have been non-linear (Brooks, 2014). The Null hypothesis holds that where the p-value of the test statistics is greater than the level of significance, the result is not significant and the regression model is linear, otherwise we reject the Null hypothesis and accept the Alternative hypothesis that the relationship is significant and the regression model is non-linear.The result for the test is usually presented in the first upper box of the first three rows.

Table 4.8A: Ramsey Reset Specification – Nigeria Data

Ramsey RESET Test
Equation: UNTITLED
Specification: NMC NCPI NEX NM2 NTBC C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.372418	25	0.1821
F-statistic	1.883532	(1, 25)	0.1821
Likelihood ratio	2.251780	1	0.1335

Source: Computation by researcher using E-view 9.5

The p-values in the table 4.8A for t and F-statistics being greater than the 5% significance level, indicates that the test statistics are not significant at the 5% level. Thus, the output from this model testing provides a best fit and can be relied upon.

Table 4.8B: Ramsey Reset Specification - South Africa Data

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(SAMC) SACPI SAEX SAM2 SATBC C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.975568	25	0.3386
F-statistic	0.951734	(1, 25)	0.3386
Likelihood ratio	1.158240	1	0.2818

Source: Computation by researcher using E-view 9.5

The p-values in the table 4.8B for South Africa, t and F-statistics are both greater than the 5% significance level indicating that the test statistics are not significant at the 5% level. Here again, we accept the Null hypothesis that the regression model for South Africa as depicted in the equation is linear. Thus, the output from this model testing provides a best fit and can be relied upon.

Table 4.8C: Ramsey RESET Specification- Kenya data

Ramsey RESET Test
Equation: UNTITLED
Specification: KMC KTBC KCPI KEX KM2 C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.167101	25	0.2542
F-statistic	1.362124	(1, 25)	0.2542
Likelihood ratio	1.644627	1	0.1997

Source: Computation by researcher using E-view 9.5

The p-values in the table 4.8C for t and F-statistics are greater than the 5% chosen level of significance indicating that the test statistics are not significant at the 5% level. We thus, accept the Null hypothesis that the regression model for Kenya is well fitted for the relationship between the variables in the model and that the regression model used is linear. We can conveniently accept the results from such research testing.

4.2.2.4 Tests for Cointegration

According to Brooks (2014), Cointegration is used in Finance to model long-run equilibrium relationship and this is further supported by Woolbridge (1994). Cointegration method has been used in several established researches to test for long-run equilibrium relationship (Levine and Zervos, 1998; and Soumare and Tchana, 2015). This forms the basis for our adoption of cointegration method to test for the existence of long-run equilibrium relationship before we can proceed with our regression analysis.

i.) Individual Country Cointegration Tests

Table 4.9A: Cointegration Test Result for Nigeria @ 5% level

Date: 01/18/18 Time: 22:51
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: MC CPI EX M2 TBC
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.693904	91.10673	69.81889	0.0004
At most 1 *	0.630787	56.77487	47.85613	0.0058
At most 2	0.426693	27.87984	29.79707	0.0819
At most 3	0.273335	11.74617	15.49471	0.1695
At most 4	0.082176	2.486751	3.841466	0.1148

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.693904	34.33186	33.87687	0.0441
At most 1 *	0.630787	28.89503	27.58434	0.0338
At most 2	0.426693	16.13367	21.13162	0.2171
At most 3	0.273335	9.259418	14.26460	0.2652
At most 4	0.082176	2.486751	3.841466	0.1148

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Computation by researcher using E-view 9.5

The cointegration result for Nigeria in table 4.9A of the trace and maximum eigenvalue tests shows the existence of two (2) cointegrating vectors (p-value of 0.0004 and 0.0058 for trace

test and 0.0441 and 0.0338 for maximum eigenvalue) between MC, CPI, EX, M2 and TBC at the 5% level of significance. This thus confirms the existence of long-run equilibrium (cointegrating) effect of CPI, EX, M2, TBC on Market Capitalization.

Table 4.9B: Cointegration Result for South-Africa data @ 5% level

Date: 01/18/18 Time: 22:02
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: MC CPI EX M2 TBC
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.704339	88.53978	69.81889	0.0008
At most 1 *	0.630948	53.20209	47.85613	0.0145
At most 2	0.325021	24.29441	29.79707	0.1883
At most 3	0.280238	12.89528	15.49471	0.1187
At most 4	0.109373	3.359071	3.841466	0.0668

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.704339	35.33769	33.87687	0.0333
At most 1 *	0.630948	28.90768	27.58434	0.0337
At most 2	0.325021	11.39914	21.13162	0.6075
At most 3	0.280238	9.536206	14.26460	0.2442
At most 4	0.109373	3.359071	3.841466	0.0668

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

Source: Computation by researcher using E-view 9.5

The table 4.9B shows that South-Africa data exhibits a cointegrating relationship between MC, CPI, EX, M2 and TBC. The trace and maximum eigen value shows the existence of two (2) cointegrating vector at the 5% significance level (p-value of 0.0008 and 0.0145 for trace statistics and maximum eigen-value of 0.0333 and 0.0337, thus confirming the existence of a long-run (cointegrating) equilibrium between market capitalization and CPI, EX, M2, TBC. We reject the null hypothesis to accept the alternative that there exists a long-run CPI, EX, M2, TBC and Market Capitalization.

Table 4.9C: Cointegration Test Result for Kenya @ 5% level

Date: 01/18/18 Time: 19:43
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: MC CPI EX M2 TBC
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.698187	88.11952	69.81889	0.0009
At most 1 *	0.619415	53.37900	47.85613	0.0139
At most 2	0.515450	25.36371	29.79707	0.1488
At most 3	0.138867	4.352177	15.49471	0.8732
At most 4	0.000569	0.016498	3.841466	0.8977

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.698187	34.74053	33.87687	0.0394
At most 1 *	0.619415	28.01529	27.58434	0.0440
At most 2	0.515450	21.01153	21.13162	0.0520
At most 3	0.138867	4.335679	14.26460	0.8223
At most 4	0.000569	0.016498	3.841466	0.8977

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

Source: Computation by researcher using E-view 9.5

Table 4.9C for Kenya, the trace and Maximum eigen-value tests shows the existence of two(2) cointegrating vector at 5% level of significance at p-values of 0.0009, 0.0139 for trace tests and 0.0394, 0.0440 and 0.0520 for eigen-value tests between CPI, EX, M2, TBC and Market Capitalization. This result confirms that CPI, EX, M2, TBC has long-run (cointegration) equilibrium effect on Market Capitalization and we reject the null hypothesis to accept the alternative that there is Cointegration. Based on the established long run relationship, the study will embark on vector error correction model for the study.

ii) Panel Data Pooled Cointegration Results

Table 4.9D: RESULT – Residual Panel Cointegration Test

Pedroni Residual Cointegration Test
Series: MC CPI EX M2 TBC
Date: 01/20/18 Time: 07:37

Sample: 1986 2016
Included observations: 93
Cross-sections included: 3
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
User-specified lag length: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	0.384124	0.3504	0.395524	0.3462
Panel rho-Statistic	1.048921	0.8529	0.777457	0.7816
Panel PP-Statistic	1.207341	0.8863	0.637959	0.7382
Panel ADF-Statistic	0.610645	0.7293	0.279117	0.6099

Alternative hypothesis: individual AR coefs. (between-dimension)

Source: Computation by researcher using E-view 9.5

From table 4.9D, Panel V-statistics confirm a positive but insignificant long-run relationship having a statistic of 0.384124 and a p-value of 0.3504 while Panel rho statistics (statistic of 1.048921 and p-value 0.8529) and Philip Peron (statistic of 1.207341 and p-value of 0.8863) both confirm a positive but insignificant long-run relationship (cointegration) between CPI, EX, M2, TBC and Market Capitalization.

Table 4.9E: RESULT – Johansen Fisher Panel Cointegration Tests

Johansen Fisher Panel Cointegration Test
Series: MC CPI EX M2 TBC
Date: 01/20/18 Time: 07:49
Sample: 1986 2016
Included observations: 93
Trend assumption: Linear deterministic trend
Lags interval (in first differences): 1 1
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	43.88	0.0000	19.52	0.0034
At most 1	27.32	0.0001	19.80	0.0030
At most 2	12.15	0.0586	9.966	0.1261
At most 3	8.083	0.2321	5.865	0.4384
At most 4	9.956	0.1265	9.956	0.1265

* Probabilities are computed using asymptotic Chi-square distribution.

Source: Computation by researcher using E-view 9.5

The Panel Cointegration Trace and Maximum Eigenvalue Tests reveal the existence of five (5) cointegrating vectors (with p-values of 0.0000, 0.0001, 0.0586, 0.0034, 0.0030 respectively and also Fisher statistic of 43.88, 27.32, 12.15, 19.52 and 19.80 respectively)

between CPI, EX, M2, TBC and Market Capitalization. This confirms the cointegration result of the residual cointegration tests of the existence of cointegration between CPI, EX, M2, TBC and Market Capitalization.

Decision rule: We reject null hypothesis of the cointegration relationship to accept the alternative that there is Cointegration. We thus, conclude that the monetary policy instruments in CPI, EX, M2, TBC have long-run equilibrium effect on Market Capitalization.

4.3 Test of Hypotheses

This Sub-section tests the hypotheses stated in chapter one and modeled in chapter three. In testing for these hypotheses, we proceeded to test the data for each country in the study area, to ascertain what the individual country result is;

Test of Hypothesis – Individual Country Output

4.3.1 Hypothesis One

H_{o1}: Money supply has no significant relationship with stock market performance of selected African developing economies.

H_1: Money supply has a significant relationship with stock market performance of selected African developing economies.

Table 4.10A: Regression Result for Nigeria – Model 1

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:31				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	**1.075097**	**0.376059**	**2.858854**	**0.0087**
EX	1.41E+08	1.50E+08	0.940988	0.3561
CPI	-2.62E+08	3.69E+08	-0.710704	0.4841
TBC	-0.148980	0.079090	-1.883676	0.0718
ECM1(-1)	0.147245	0.224522	0.655816	0.5182
C	2.54E+09	6.43E+09	0.395895	0.6957
R-squared	0.761582	Mean dependent var		2.28E+10
Adjusted R-squared	0.711911	S.D. dependent var		2.53E+10

S.E. of regression	1.36E+10	Akaike info criterion	49.67785
Sum squared resid	4.42E+21	Schwarz criterion	49.95809
Log likelihood	-739.1677	Hannan-Quinn criter.	49.76750
F-statistic	15.33267	Durbin-Watson stat	2.009124
Prob(F-statistic)	0.000001		

Source: Computation by researcher using E-view 9.5

In table 4.10A, the R^2 and Adjusted R^2 both showed 76.16% and 71.19% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is 76.16% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 76.16%. Also, with a high Adjusted R^2 (71.19%) implies that the model can take on more variables conveniently without the R^2 falling beyond 71.19%, which is very commendable. F-statistics of 15.33267 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant and displays a Durbin-Watson of 2.009 is considered good as it shows absence of autocorrelation on the chosen data.

Hence, from the table 4.10A, the Nigeria M2, has a t-statistic value of 2.858854 and a p-value of 0.0087, was found to have a positive relationship and impact on market capitalization and this impact is statistically significant at 5% level since its p-value is well below 0.05. Therefore, we reject null hypothesis to accept the alternative. This supports the view that the past level of money supply (M2) in Nigeria positively impact market capitalization.

Table 4.10B: Regression Result for South Africa – Model

Dependent Variable: MC
Method: Least Squares
Date: 08/25/18 Time: 23:42
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	**1.828088**	**3.594335**	**0.508603**	**0.6157**
EX	7.86E+09	1.28E+09	6.155132	0.0000
CPI	-3.47E+09	2.17E+09	-1.601089	0.1224
TBC	1.224898	0.151383	8.091408	0.0000

ECM(-1)	-0.100876	0.205954	-0.489798	0.6287
C	-9.67E+11	1.63E+11	-5.936543	0.0000
R-squared	0.965870	Mean dependent var		4.41E+11
Adjusted R-squared	0.958759	S.D. dependent var		3.06E+11
S.E. of regression	6.22E+10	Akaike info criterion		52.72315
Sum squared resid	9.30E+22	Schwarz criterion		53.00339
Log likelihood	-784.8473	Hannan-Quinn criter.		52.81280
F-statistic	135.8382	Durbin-Watson stat		2.036373
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

The result in table 4.10B shows R^2 and Adjusted R^2 of 96.59% and 95.88% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is 96.59% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 96.59%. Also, with a high Adjusted R^2 (95.88%) implies that the model can take on more variables conveniently without the R^2 falling beyond 95.88%. F-statistics of 135.8382 is considered acceptable being positive and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.00000 is rightly signed and very significant and displays a Durbin-Watson of 2.036373, showing absence of the presence of autocorrelation on the chosen data.

Hence, from table 4.10B, the South Africa M2, has a t-statistic value of 0.508603 and a p-value of 0.6157, was found to have a positive relationship with market capitalization and this relationship is statistically insignificant at 5% level since its p-value is well above 0.05. Therefore, we accept the null hypothesis thereby rejecting the alternative. It shows that past levels of M2 have positive but insignificant relationship with market capitalization in South Africa.

Table 4.10C: Regression Result for Kenya – Model 1

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:55				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.

M2	**1.723238**	**0.699316**	**2.464175**	**0.0213**
EX	59473384	57696704	1.030793	0.3129
CPI	53698439	92842625	0.578381	0.5684
TBC	-0.898896	0.270135	-3.327586	0.0028
ECM(-1)	0.069628	0.217330	0.320380	0.7515
C	4.05E+08	1.64E+09	0.247474	0.8066
R-squared	0.919367	Mean dependent var		6.34E+09
Adjusted R-squared	0.902568	S.D. dependent var		6.62E+09
S.E. of regression	2.07E+09	Akaike info criterion		45.91316
Sum squared resid	1.03E+20	Schwarz criterion		46.19340
Log likelihood	-682.6974	Hannan-Quinn criter.		46.00281
F-statistic	54.72900	Durbin-Watson stat		1.940025
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

In table 4.10C, R^2 and Adjusted R^2 both showed 91.94% and 90.26% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is 91.94% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 91.94%. Also, with a high Adjusted R^2 (90.26%) implies that the model can take on more variables conveniently without the R^2 falling beyond 90.26%, which is acceptable. The F-statistics of 54.72900 with probability (F-statistics) of 0.0000 and Durbin-Watson Statistic of 1.940025 (Showing absence of autocorrelation) are considered very good being positive and significant.

Hence, from table 4.10C, the Kenya M2 has a t-statistic value of 2.464175 and a p-value of 0.0213, was found to have a positive and statistically significant relationship with market capitalization at 5% level since its p-value is well below 0.05. Therefore, we reject the null hypothesis to accept the alternative for Kenya.

4.3.2 Hypothesis Two

H_{o2}: Deposit money banks total credit have no significant relationship with stock market performance of selected African developing economies.

H_2: Deposit money banks total credit have significant relationship with stock market performance of selected African developing economies.

Table 4.11A: Regression Result for Nigeria – Model 2

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:31				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.075097	0.376059	2.858854	0.0087
EX	1.41E+08	1.50E+08	0.940988	0.3561
CPI	-2.62E+08	3.69E+08	-0.710704	0.4841
TBC	**-0.148980**	**0.079090**	**-1.883676**	**0.0718**
ECM1(-1)	0.147245	0.224522	0.655816	0.5182
C	2.54E+09	6.43E+09	0.395895	0.6957
R-squared	0.761582	Mean dependent var		2.28E+10
Adjusted R-squared	0.711911	S.D. dependent var		2.53E+10
S.E. of regression	1.36E+10	Akaike info criterion		49.67785
Sum squared resid	4.42E+21	Schwarz criterion		49.95809
Log likelihood	-739.1677	Hannan-Quinn criter.		49.76750
F-statistic	15.33267	Durbin-Watson stat		2.009124
Prob(F-statistic)	0.000001			

Source: Computation by researcher using E-view 9.5

From table 4.10A, the Nigeria TBC, has a t-statistic value of -1.883676 and a p-value of 0.0718, was found to have a negative and statistically insignificant relationship with market capitalization at 5% level since its p-value is well above 0.05 Therefore, we accept null hypothesis to reject the alternative. The implication of this result is that TBC has a depressive effect on market capitalization in Nigeria and that a 1% increase in future TBC will result to a -0.148980% falls in Market capitalization (liquidity) in Nigeria.

Table 4.11B: Regression Result for South Africa – Model 2

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:42				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.828088	3.594335	0.508603	0.6157
EX	7.86E+09	1.28E+09	6.155132	0.0000
CPI	-3.47E+09	2.17E+09	-1.601089	0.1224
TBC	**1.224898**	**0.151383**	**8.091408**	**0.0000**
ECM(-1)	-0.100876	0.205954	-0.489798	0.6287
C	-9.67E+11	1.63E+11	-5.936543	0.0000
R-squared	0.965870	Mean dependent var		4.41E+11
Adjusted R-squared	0.958759	S.D. dependent var		3.06E+11
S.E. of regression	6.22E+10	Akaike info criterion		52.72315
Sum squared resid	9.30E+22	Schwarz criterion		53.00339
Log likelihood	-784.8473	Hannan-Quinn criter.		52.81280
F-statistic	135.8382	Durbin-Watson stat		2.036373

Prob(F-statistic)	0.000000

Source: Computation by researcher using E-view 9.5

From table 4.10B, the South Africa TBC, has a t-statistic value of 8.091408 and a p-value of 0.0000, was found to have a positive and statistically significant relationship with market capitalization at 5% level since its p-value is well less than 0.05. Therefore, we reject the null hypothesis to accept the alternative. The implication of this result is that TBC has an impressive effect on market capitalization and a 1% increase in future levels of TBC will result to a 1.224898% increase in Market capitalization in South Africa.

Table 4.11C: Regression Result for Kenya – Model 2

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:55				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.723238	0.699316	2.464175	0.0213
EX	59473384	57696704	1.030793	0.3129
CPI	53698439	92842625	0.578381	0.5684
TBC	**-0.898896**	**0.270135**	**-3.327586**	**0.0028**
ECM(-1)	0.069628	0.217330	0.320380	0.7515
C	4.05E+08	1.64E+09	0.247474	0.8066
R-squared	0.919367	Mean dependent var		6.34E+09
Adjusted R-squared	0.902568	S.D. dependent var		6.62E+09
S.E. of regression	2.07E+09	Akaike info criterion		45.91316
Sum squared resid	1.03E+20	Schwarz criterion		46.19340
Log likelihood	-682.6974	Hannan-Quinn criter.		46.00281
F-statistic	54.72900	Durbin-Watson stat		1.940025
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

The table 4.10C for Kenyan's TBC, has a t-statistic value of -3.327586 and a p-value of 0.0028 was found to have a negative but statistically significant relationship with market capitalization at 5% level since its p-value is well less than 0.05. Therefore, we reject the null hypothesis to accept the alternative. The implication of this result is that a 1% increase in future

levels of TBC will have a negative effect on market capitalization and result to a -0.898896% decrease in Market capitalization in Kenya.

4.3.3 Hypothesis Three

H_{o3}: There is no significant relationship between consumer price index and stock market performance of selected African developing economies.

H_{o3}: There is a significant relationship between consumer price index and stock market performance of selected African developing economies.

Table 4.12A: Regression Result for Model 3 (Nigeria)

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:31				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.075097	0.376059	2.858854	0.0087
EX	1.41E+08	1.50E+08	0.940988	0.3561
CPI	**-2.62E+08**	**3.69E+08**	**-0.710704**	**0.4841**
TBC	-0.148980	0.079090	-1.883676	0.0718
ECM1(-1)	0.147245	0.224522	0.655816	0.5182
C	2.54E+09	6.43E+09	0.395895	0.6957
R-squared	0.761582	Mean dependent var		2.28E+10
Adjusted R-squared	0.711911	S.D. dependent var		2.53E+10
S.E. of regression	1.36E+10	Akaike info criterion		49.67785
Sum squared resid	4.42E+21	Schwarz criterion		49.95809
Log likelihood	-739.1677	Hannan-Quinn criter.		49.76750
F-statistic	15.33267	Durbin-Watson stat		2.009124
Prob(F-statistic)	0.000001			

Source: Computation by researcher using E-view 9.5

From table 4.10A, the Nigeria CPI, has a t-statistic value of -0.710704 and a p-value of 0.4841, was found to have a negative and statistically insignificant relationship with market capitalization at 5% level since its p-value is well above 0.05. Therefore, we accept the null hypothesis to reject the alternative. The implication of this result is that a 1% increase in CPI will

result to a -2.6208% fall in market capitalization, showing a depressive effect of the variable on market capitalization in Nigeria.

Table 4.12B: Regression Result for Model 3 (South Africa)

Dependent Variable: MC
Method: Least Squares
Date: 08/25/18 Time: 23:42
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.828088	3.594335	0.508603	0.6157
EX	7.86E+09	1.28E+09	6.155132	0.0000
CPI	**-3.47E+09**	**2.17E+09**	**-1.601089**	**0.1224**
TBC	1.224898	0.151383	8.091408	0.0000
ECM(-1)	-0.100876	0.205954	-0.489798	0.6287
C	-9.67E+11	1.63E+11	-5.936543	0.0000
R-squared	0.965870	Mean dependent var		4.41E+11
Adjusted R-squared	0.958759	S.D. dependent var		3.06E+11
S.E. of regression	6.22E+10	Akaike info criterion		52.72315
Sum squared resid	9.30E+22	Schwarz criterion		53.00339
Log likelihood	-784.8473	Hannan-Quinn criter.		52.81280
F-statistic	135.8382	Durbin-Watson stat		2.036373
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

From table 4.10B, the South Africa CPI has a t-statistic value of -1.601089 and a p-value of 0.1224 was found to have a negative and statistically insignificant relationship with market capitalization at 5% level of significance since its p-value is well above 0.05. Therefore, we accept null hypothesis to reject the alternative. The implication of this result is that a 1% increase in CPI will result to a -3.4709% fall in value of market capitalization in South Africa and means that future CPI has depressive effect on market capitalization.

Table 4.12C: **Regression Result for Model 3 (Kenya)**

Dependent Variable: MC
Method: Least Squares
Date: 08/25/18 Time: 23:55
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.723238	0.699316	2.464175	0.0213
EX	59473384	57696704	1.030793	0.3129
CPI	**53698439**	**92842625**	**0.578381**	**0.5684**
TBC	-0.898896	0.270135	-3.327586	0.0028
ECM(-1)	0.069628	0.217330	0.320380	0.7515
C	4.05E+08	1.64E+09	0.247474	0.8066

R-squared	0.919367	Mean dependent var	6.34E+09
Adjusted R-squared	0.902568	S.D. dependent var	6.62E+09
S.E. of regression	2.07E+09	Akaike info criterion	45.91316
Sum squared resid	1.03E+20	Schwarz criterion	46.19340
Log likelihood	-682.6974	Hannan-Quinn criter.	46.00281
F-statistic	54.72900	Durbin-Watson stat	1.940025
Prob(F-statistic)	0.000000		

Source: Computation by researcher using E-view 9.5

From table 4.10C, the Kenya CPI, has a t-statistic value of 0.578381 and a p-value of 0.5684, was found to have a positive but have statistically insignificant relationship with market capitalization at 5% level of significance since its p-value is well above 0.05. Therefore, we accept null hypothesis to reject the alternative. The implication of this result is that a 1% increase CPI will bring a percentage fall in market capitalization in Kenya.

4.3.4 Hypothesis Four

H_{o4}: Foreign exchange has no significant relationship with stock market performance of selected African developing economies.

H_{o4}: Foreign exchange has a significant relationship with stock market performance of selected African developing economies.

Table 4.13A: **Regression Result for Model 4 (Nigeria)**

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:31				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.075097	0.376059	2.858854	0.0087
EX	**1.41E+08**	**1.50E+08**	**0.940988**	**0.3561**
CPI	-2.62E+08	3.69E+08	-0.710704	0.4841
TBC	-0.148980	0.079090	-1.883676	0.0718
ECM1(-1)	0.147245	0.224522	0.655816	0.5182
C	2.54E+09	6.43E+09	0.395895	0.6957
R-squared	0.761582	Mean dependent var		2.28E+10
Adjusted R-squared	0.711911	S.D. dependent var		2.53E+10
S.E. of regression	1.36E+10	Akaike info criterion		49.67785
Sum squared resid	4.42E+21	Schwarz criterion		49.95809
Log likelihood	-739.1677	Hannan-Quinn criter.		49.76750
F-statistic	15.33267	Durbin-Watson stat		2.009124
Prob(F-statistic)	0.000001			

Source: Computation by researcher using E-view 9.5

From table 4.10A, the Nigeria EX, has a t-statistic value of 0.940988 and a p-value of 0.3561 which was found to have a positive but statistically insignificant relationship with market capitalization at 5% level of significance since its p-value is well below 0.05. Therefore, we reject the null hypothesis to accept the alternative. This shows that future levels of EX changes will negatively affect market capitalization and implies that a 1% increase in EX will result to -1.4108% fall in market capitalization in Nigeria.

Table 4.13B: **Regression Result for Model 4 (South Africa)**

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:42				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.828088	3.594335	0.508603	0.6157
EX	**7.86E+09**	**1.28E+09**	**6.155132**	**0.0000**
CPI	-3.47E+09	2.17E+09	-1.601089	0.1224
TBC	1.224898	0.151383	8.091408	0.0000
ECM(-1)	-0.100876	0.205954	-0.489798	0.6287
C	-9.67E+11	1.63E+11	-5.936543	0.0000
R-squared	0.965870	Mean dependent var		4.41E+11
Adjusted R-squared	0.958759	S.D. dependent var		3.06E+11
S.E. of regression	6.22E+10	Akaike info criterion		52.72315
Sum squared resid	9.30E+22	Schwarz criterion		53.00339
Log likelihood	-784.8473	Hannan-Quinn criter.		52.81280
F-statistic	135.8382	Durbin-Watson stat		2.036373
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

From table 4.10B, the South Africa EX, has a t-statistic value of 6.155132 and a p-value of 0.0000, was found to have a positive and statistically significant effect on market capitalization at 5% level of significance since its p-value is well below 0.05. Therefore, we reject null hypothesis to accept the alternative. This shows that future levels of EX will positively and significantly affect market capitalization and implies that a 1% increase in future levels of EX will result to a 7.8609% increase in market capitalization in South Africa.

Table 4.13C: **Regression Result for Model 4 (Kenya)**

Dependent Variable: MC				
Method: Least Squares				
Date: 08/25/18 Time: 23:55				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.723238	0.699316	2.464175	0.0213
EX	**59473384**	**57696704**	**1.030793**	**0.3129**
CPI	53698439	92842625	0.578381	0.5684
TBC	-0.898896	0.270135	-3.327586	0.0028
ECM(-1)	0.069628	0.217330	0.320380	0.7515
C	4.05E+08	1.64E+09	0.247474	0.8066
R-squared	0.919367	Mean dependent var		6.34E+09
Adjusted R-squared	0.902568	S.D. dependent var		6.62E+09
S.E. of regression	2.07E+09	Akaike info criterion		45.91316
Sum squared resid	1.03E+20	Schwarz criterion		46.19340
Log likelihood	-682.6974	Hannan-Quinn criter.		46.00281
F-statistic	54.72900	Durbin-Watson stat		1.940025
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

From table 4.10C, the Kenya EX, has a t-statistic value of 1.030793 and a p-value of 0.3129, was found to have a positive but statistically insignificant relationship with market capitalization at 5% level of significance since its p-value is well below 0.05. Therefore, we reject the null hypothesis thereby accepting the alternative hypothesis. This shows that future levels of EX in Kenya will have a depressive effect on market capitalization except after a two year period for a possible positive effect can be felt and the result further indicates that a 1% increase in EX will result to a 1.3508% fall in market capitalization in Kenya.

4.3.5 Hypothesis Five

H_{o5}: There is no causal effect between monetary policy and stock market performance of selected African developing economies.

H_5: There is causal effect between monetary policy and stock market performance of selected African developing economies.

Table 4.14A: Pairwise Granger Causality Test for Model 5 - Nigeria

Pairwise Granger Causality Tests
Date: 01/20/18 Time: 20:27
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
MC does not Granger Cause CPI	29	1.34583	0.2793	Accept
CPI does not Granger Cause MC		2.48295	0.1047	Accept
MC does not Granger Cause EX	29	5.83675	0.0086	Reject
EX does not Granger Cause MC		2.05517	0.1500	Accept
MC does not Granger Cause M2	29	15.5120	0.00005	Reject
M2 does not Granger Cause MC		1.68058	0.2075	Accept
TBC does not Granger Cause MC	29	0.21210	0.8104	Accept
MC does not Granger Cause TBC		14.7732	0.00007	Reject

Source: Computation by researcher using E-view 9.5

From the Granger Causality Test result in Table 4.11A, for Nigeria, the test was carried out with a lag 2period, monetary policy instrument is unbundled into four variants and their causal relationship with market capitalization tested. The choice of a lag of 2 is aimed at not sacrificing greater degrees of freedom which may be prejudicial to the outcome of the test. From the results, there was no causality relationship from CPI to MC and no feedback returning from MC to CPI (since the p-values – 0.2793 is more than the 5% chosen level of significance). While, there was a uni-directional relationship from MC to EX (p-value, 0.0086). There were however, no causal relationships between M2, TBC and MC for the Nigeria situation.

Decision: We reject the alternative hypothesis that monetary policy predicts market capitalization thereby stating that monetary policy does not predict market capitalization in Nigeria.

Table 4.14B: Pairwise Granger Causality Test for Model 5–South Africa

Pairwise Granger Causality Tests
Date: 01/20/18 Time: 21:02
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
MC does not Granger Cause CPI	29	5.35668	0.0119	Reject
CPI does not Granger Cause MC		1.71539	0.2012	Accept
MC does not Granger Cause EX	29	2.00103	0.1571	Accept
EX does not Granger Cause MC		1.01254	0.3783	Accept

MC does not Granger Cause M2	29	3.14966	0.0610	Accept
M2 does not Granger Cause MC		1.27372	0.2980	Accept
MC does not Granger Cause TBC	29	0.81362	0.4551	Accept
TBC does not Granger Cause MC		2.42840	0.1095	Accept

Source: Computation by researcher using E-view 9.5

From the Granger Causality Test result in Table 4.11B for South Africa carried out using 2 period lag, monetary policy instrument is unbundled into four variants and their causal relationship with market capitalization tested. The choice of a lag of 2 is aimed at not sacrificing greater degrees of freedom which may be prejudicial to the outcome of the test. The results show No causal relationship between EX, CPI, M2, TBC and the Johannesburg stock market capitalization (Since their respective p-values are greater than 5% the chosen level of significance). However, there was uni-directional relationship from MC to CPI with p-value of 0.0119.

Decision: We accept the null hypothesis in all of the circumstances that there is no causal effect of monetary policy on South Africa stock market capitalization, while we reject the alternative hypothesis.

Table4.14C: **Pairwise Granger Causality Test for Model 5- Kenya**

Pairwise Granger Causality Tests
Date: 01/20/18 Time: 21:29
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
MC does not Granger Cause CPI	29	4.15952	0.0281	Reject
CPI does not Granger Cause MC		5.60588	0.0101	Reject
MC does not Granger Cause EX	29	1.36342	0.2749	Accept
EX does not Granger Cause MC		1.24245	0.3066	Accept
MC does not Granger CauseM2	29	3.35387	0.0519	Accept
M2 does not Granger Cause MC		1.06002	0.3621	Accept
MC does not Granger Cause TBC	29	6.51429	0.0055	Reject
TBC does not Granger Cause MC		3.62090	0.0422	Reject

Source: Computation by researcher using E-view 9.5

From the Granger Causality Test result in Table 4.11C for Kenya conducted using a lag of 2period, monetary policy was sub-divided into four sub-units and each causal effect with market capitalization tested. From the results, we observed a Bi-directional causality relationship running from MC to CPI (p-value of 0.0281) with a feedback returning from CPI to MC (0.0101) and MC to TBC (p-value of 0.0055) with a feedback returning from TBC to MC (0.0422). No causal relationship was observed between MC and EX, M2 and vice versa.

Decision: We accept the null hypothesis that monetary policy does not drive the Kenyan market capitalization thereby rejecting the alternative of causal effect of monetary policy on the Kenyan market capitalization.

4.3.6 Test of Hypothesis – Pooled Effect Output

The data for the selected study areas were pooled together to enable the researchers determine the optimum overall result for the developing African region, adopting the following procedures;

Table 4.15A –POOLED EFFECT PANEL EGLS (E-views Generalized Least Square)

Dependent Variable: MC
Method: Panel EGLS (Period weights)
Date: 08/26/18 Time: 07:29
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-85478015	37772251	-2.262984	0.0262
M2	-1.115039	0.080152	-13.91157	0.0000
CPI	2.47E+08	50968388	4.840256	0.0000
TBC	0.677221	0.004993	135.6322	0.0000
ECM(-1)	0.563347	0.031428	17.92478	0.0000
C	-9.73E+09	2.62E+09	-3.711992	0.0004

Weighted Statistics

R-squared	0.997486	Mean dependent var	3.97E+11
Adjusted R-squared	0.997336	S.D. dependent var	1.10E+12
S.E. of regression	5.35E+10	Sum squared resid	2.40E+23
F-statistic	6665.070	Durbin-Watson stat	1.944483
Prob(F-statistic)	0.000000		

	Unweighted Statistics		
R-squared	0.960882	Mean dependent var	1.57E+11
Sum squared resid	2.49E+23	Durbin-Watson stat	2.067078

Source: Computation by researcher using E-view 9.5

The pooled effect model results in table 4.12A, was carried out using Generalized Least square period weightings and the R^2 and Adjusted R^2 both showed 99.75% and 99.73% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit panel regression model is 99.75% and implies that chosen explanatory variables explain variations in the dependent variable to the tune of 99.75%. The square of the correlation between the value of the dependent variable and the corresponding fitted values from the model. A correlation coefficient must be between -1 and +1 by definition. Hence, a high correlation of 99.75% implies that the model fits the data well and thus provides a very good fit to the data. Also, with a high Adjusted R^2 (99.73%) implies that the model can take on more variables conveniently without the R^2 falling beyond 99.73%, which is very commendable. F-statistics of 6665.070 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant. The Durbin-Watson of 2.06707 is considered to be very good and lends credence to the reliability of the outcome of this research work.

Table 4.15B – FIXED EFFECT PANEL E-views Generalized Least Square (EGLS)

Dependent Variable: MC
Method: Panel Least Squares
Date: 08/26/18 Time: 07:33
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	9.98E+08	3.77E+08	2.649803	0.0106
M2	-2.258349	0.634280	-3.560493	0.0008
CPI	-1.93E+09	1.24E+09	-1.556954	0.1254
TBC	0.778816	0.058342	13.34922	0.0000
ECM(-1)	0.207151	0.151863	1.364064	0.1783

C	1.83E+10	7.40E+10	0.246848	0.8060
Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.979877	Mean dependent var		1.57E+11
Adjusted R-squared	0.966208	S.D. dependent var		2.68E+11
S.E. of regression	4.92E+10	Akaike info criterion		52.36927
Sum squared resid	1.28E+23	Schwarz criterion		53.39697
Log likelihood	-2319.617	Hannan-Quinn criter.		52.78370
F-statistic	71.68770	Durbin-Watson stat		1.977565
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.5

Fixed Effect panel analysis was also carried out to compare the output of this panel data analysis obtained from the pooled data with the fixed effect. In table 4.12B, The R^2 and Adjusted R^2 both showed 97.99% and 96.62% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit panel regression model is 97.99% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 97.99%. The square of the correlation between the value of the dependent variable and the corresponding fitted values from the model. Also, with a high Adjusted R^2 (96.62%) implies that the model can take on more variables conveniently without the R^2 falling beyond 97.99%, which is very commendable. F-statistics of 71.68770 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant. The Durbin-Watson of 1.977565 is considered good and shows that the outcome of this academic exercise is very reliable.

Table 4.15C: RANDOM EFFECT PANEL (E-views Generalized Least Square (EGLS))

Dependent Variable: MC				
Method: Panel EGLS (Two-way random effects)				
Date: 08/26/18 Time: 07:36				
Sample (adjusted): 1987 2016				
Periods included: 30				
Cross-sections included: 3				
Total panel (balanced) observations: 90				
Wallace and Hussain estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-64691504	1.74E+08	-0.371236	0.7114
M2	-1.216551	0.366034	-3.323598	0.0013

CPI	2.57E+08	2.15E+08	1.195733	0.2352
TBC	0.676044	0.016574	40.78950	0.0000
ECM(-1)	0.563069	0.092141	6.110954	0.0000
C	-1.15E+10	1.42E+10	-0.812371	0.4189
	Effects Specification			
			S.D.	Rho
Cross-section random			0.000000	0.0000
Period random			1.64E+10	0.0899
Idiosyncratic random			5.21E+10	0.9101
	Weighted Statistics			
R-squared	0.962943	Mean dependent var		1.38E+11
Adjusted R-squared	0.960738	S.D. dependent var		2.62E+11
S.E. of regression	5.20E+10	Sum squared resid		2.27E+23
F-statistic	436.5612	Durbin-Watson stat		2.086251
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.960940	Mean dependent var		1.57E+11
Sum squared resid	2.49E+23	Durbin-Watson stat		2.068581

Source: Computation by researcher using E-view 9.5

The Random effect panel model was also carried out with above results in table 4.12C to compare the outcome of the process with earlier results and be able to ascertain which procedure gives the best output in terms of R^2, Adjusted R^2, F-statistics, Probability and Durbin-Watson. The result shows that the Random effect model produced the least R^2 (96.29%), Adjusted R^2 (96.07%), F-statistics (436.56), and Durbin-Watson (2.086251), this was the least result of the three panel data analytical procedures namely - pooled effect, fixed effect and the random effect model. Of the three test procedures, the pooled effect model of the panel data analysis produced the better result in terms of - R^2 (99.75%), Adjusted R^2 (99.73%), F-statistics (6665.070), and Durbin-Watson (2.06707) and the overall probability was significant at 0.0000.

However, we shall further subject the result of above test procedures to Redundant Fixed Effects Test and the Correlation Random Effect-Hausman Test for both the fixed effect model and Random effect model respectively as a confirmatory tests to determine which of the panel data testing technique to be adopted for our analysis.

Table 4.15D: Redundant Fixed Effects Test

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section and period fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.447296	(2,53)	0.0963

Cross-section Chi-square	7.949886	2	0.0188
Period F	1.572972	(29,53)	0.0756
Period Chi-square	55.884909	29	0.0020
Cross-Section/Period F	1.608458	(31,53)	0.0631
Cross-Section/Period Chi-square	59.678839	31	0.0015

Source: Computation by researcher using E-view 9.5

The p-value associated with the test statistics in table 4.12D is insignificant at 0.0756 when compared to chosen significance level of 5%. Hence, we undertake the Hausman Test to determine its own result and adopt the best outcome for our panel data analysis.

Table 4.15E: Correlated Random Effect Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section and period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000
Period random	0.000000	5	1.0000
Cross-section and period random	0.000000	5	1.0000

Source: Computation by researcher using E-view 9.5

The p-value for the Hausman Tests in table 4.12E is greater than 5% chosen level of significance and shows that the fixed effect model estimates will give a good result.

4.3.7 Hypothesis One- Pooled Effect Output

H_{o1}: Money supply has no significant relationship with stock market performance(proxy by market capitalization) of selected African developing economies.

H_1: Money supply has a significant relationship with stock market performance(proxy by market capitalization) of selected African developing economies.

Table 4.15A: Result-Market Capitalization Panel (EGLS test) for Model 1

Dependent Variable: MC				
Method: Panel EGLS (Period weights)				
Date: 08/26/18 Time: 07:29				
Sample (adjusted): 1987 2016				
Periods included: 30				
Cross-sections included: 3				
Total panel (balanced) observations: 90				
Linear estimation after one-step weighting matrix				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-85478015	37772251	-2.262984	0.0262
M2	**-1.115039**	**0.080152**	**-13.91157**	**0.0000**
CPI	2.47E+08	50968388	4.840256	0.0000

TBC	0.677221	0.004993	135.6322	0.0000
ECM(-1)	0.563347	0.031428	17.92478	0.0000
C	-9.73E+09	2.62E+09	-3.711992	0.0004
Weighted Statistics				

Source: Computation by researcher using E-view 9.5

From table 4.12A, M2, has a t-statistic value of -13.91157 and a p-value of 0.0000, was found to have a negative effect on market capitalization and this effect is statistically significant at 5% level since its p-value is well less than 0.05%. Therefore, we reject the null hypothesis to accept the alternative.

This result is very instructive as past levels of M2 shows negative and significant relational effect on market capitalization within the selected developing African economies at the 5% level of significance and indicates that a 1% increase in past levels of M2 will result to a -1.115039% decline in market capitalization.

Decision Rule: We reject the null hypothesis and accept the alternative that money supply (M2) has significant relationship with stock market performance (proxy by market capitalization) of selected African developing economies.

4.3.8 Hypothesis Two- Pooled Effect Output

H_{o2}: Deposit money banks total credit have no significant relationship with stock market performance of selected African developing economies.

H_2: Deposit money banks total credit have a significant relationship with stock market performance of selected African developing economies.

Table 4.16: Result-Market Capitalization – Panel (EGLS test) for Model 2

Dependent Variable: MC
Method: Panel EGLS (Period weights)
Date: 08/26/18 Time: 07:29
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-85478015	37772251	-2.262984	0.0262

M2	-1.115039	0.080152	-13.91157	0.0000
CPI	2.47E+08	50968388	4.840256	0.0000
TBC	**0.677221**	**0.004993**	**135.6322**	**0.0000**
ECM(-1)	0.563347	0.031428	17.92478	0.0000
C	-9.73E+09	2.62E+09	-3.711992	0.0004
Weighted Statistics				

Source: Computation by researcher using E-view 9.5

From table 4.12A, TBC, has a t-statistic value of 135.6322 and a p-value of 0.0000, was found to have a positive relationship with market capitalization and this relational effect is statistically significant at 5% level since its p-value is well below 0.05%. Therefore, we reject the null hypothesis and accept the alternative hypothesis.

This result indicates that the coefficients of the past levels of TBC has a positive sign and incremental effect on market capitalization at the 5% level of significance and the implication is that a 1% increase in total bank credit will result to a 0.677221% rise in market capitalization.

Decision Rule: We therefore reject the null hypothesis and accept the alternative that Deposit money banks total credit has a significant relationship with stock market performance of selected African developing economies

4.3.9 Hypothesis Three- Pooled Effect Output

H_{o3}: There is no significant relationship between consumer price index and stock market performance of selected African developing economies.

H_3: There is a significant relationship between consumer price index and stock market performance of selected African developing economies.

Table 4.17A: Result-Market Capitalization - Panel (EGLS test) for Model 3

Dependent Variable: MC
Method: Panel EGLS (Period weights)
Date: 08/26/18 Time: 07:29
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-85478015	37772251	-2.262984	0.0262
M2	-1.115039	0.080152	-13.91157	0.0000

CPI	**2.47E+08**	**50968388**	**4.840256**	**0.0000**
TBC	0.677221	0.004993	135.6322	0.0000
ECM(-1)	0.563347	0.031428	17.92478	0.0000
C	-9.73E+09	2.62E+09	-3.711992	0.0004
Weighted Statistics				

Source: Computation by researcher using E-view 9.5

From table 4.20, CPI, has a t-statistic value of 4.840256 and a p-value of 0.0000, was found to have a positive relational effect on market capitalization and this relationship is statistically significant at 5% level since its p-value is well below 0.05. Therefore, we reject the null hypothesis to accept the alternative hypothesis.

This result demonstrates that the coefficients of the past levels of CPI is positively signed and progressively significant on market capitalization at the 5% level of significance and implies that a 1% increase in consumer price index will cause a 2.4708% increase in market capitalization. This supports the view that past levels of CPI has positive and significant relational effect on market capitalization.

Decision Rule: We reject the null hypothesis and accept the alternative hypothesis that there is significant relationship between consumer price index and stock market performance of selected African developing economies.

4.3.10 Hypothesis Four- Pooled Effect Output

H_{o4}: Foreign exchange has no significant relationship with stock market performance of selected African developing economies.

H_4: Foreign exchange has a significant relationship with stock market performance of selected African developing economies.

TABLE 4.18: Result- Market Capitalization–Panel (EGLS test) for Model 4

Dependent Variable: MC
Method: Panel EGLS (Period weights)
Date: 08/26/18 Time: 07:29
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90

Linear estimation after one-step weighting matrix				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	**-85478015**	**37772251**	**-2.262984**	**0.0262**
M2	-1.115039	0.080152	-13.91157	0.0000
CPI	2.47E+08	50968388	4.840256	0.0000
TBC	0.677221	0.004993	135.6322	0.0000
ECM(-1)	0.563347	0.031428	17.92478	0.0000
C	-9.73E+09	2.62E+09	-3.711992	0.0004
Weighted Statistics				

Source: Computation by researcher using E-view 9.5

From table 4.12A, EX, has a t-statistic value of -2.262984 and a p-value of 0.0262, was found to have a negative relational effect on market capitalization and this effect is statistically significant at 5% level since its p-value is well below 0.05. Therefore, we reject the null hypothesis to accept the alternative hypothesis. The implication of this result is that the coefficients of past levels of EX had a negative but statistically significant effect on market capitalization at the 5% level of significance and a 1% increase in foreign exchange rate (EX) value will lead to decrease in market capitalization.

Decision Rule: We Reject the null hypothesis and accept the alternative that foreign exchange (rate) has significant relationship with stock market performance of selected African developing economies.

4.3.11 Hypothesis Five- Pooled Effect Output

H_{o5}: There is no causal effect between monetary policy and stock market performance of selected African developing economies.

H_{o5}: There is causal effect between monetary policy and stock market performance of selected African developing economies.

Table 4.19: Result for Causality Effect – Model 5

Pairwise Granger Causality Tests
Date: 01/21/18 Time: 12:53
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
MC does not Granger Cause CPI	87	3.73880	0.0279	Reject
CPI does not Granger Cause MC		0.04275	0.9582	Accept

MC does not Granger Cause EX	87	2.20357	0.1169	Accept
EX does not Granger Cause MC		0.04959	0.9516	Accept
MC does not Granger Cause M2	87	0.81417	0.4466	Accept
M2 does not Granger Cause MC		0.22230	0.8012	Accept
MC does not Granger Cause TBC	87	1.19130	0.3090	Accept
TBC does not Granger Cause MC		7.84512	0.0008	Reject

Source: Computation by researcher using E-view 9.5

The result from table 4.13 showing Granger Causality of monetary policy against market capitalization carried out at the 5% level of significance using a lag of 2 period reveals that M2 and MC for the panel pooled data, does not Granger Cause each other with F-statistics of 0.81417 and 0.22230 with p-values of 0.4466 and 0.8012 respectively above the 5% level of significance. This shows that though the relationship is positive, they are however not statistically significant.

Similarly, EX does not granger cause MC nor does MC granger cause EX as the F-statistic is positive at 0.04959 and 2.20357 with p-values of 0.9516 and 0.1169 respectively which are well above the chosen level of significance; hence, EX has a positive but insignificant influence on MC and vice versa at the 5% significant level. Also, the table further shows that CPI does not granger cause MC with F-statistics of 0.04275 and p-value of 0.9582 while MC however granger cause CPI with F-statistics of 3.73880 and p-value of 0.0279. Hence, there is a uni-directional effect from MC to CPI at 5% level of significance.

Also, MC does not granger cause TBC at the 5% level of significance with F-statistic of 1.19130 with p-value of 0.3090 while TBC granger cause MC at the 5% level of significance with F-statistics of 7.84512 and p-value of 0.0008, which shows uni-directional relationship from TBC to MC.

Decision Rule: based on the overall result of the study on granger causality we accept null hypothesis to reject alternative hypothesis that there is no causal effect between monetary policy

in money supply and others on stock market performance of selected African developing economies.

4.4 Discussion of Findings

This study examined the interaction between monetary policy and stock market performance, evidence from selected developing African economies from 1986 to 2016 with a view to affirming or refuting the nexus of interaction between monetary policy and stock market performance (market capitalization) in selected developing African economies using empirical evidence from Nigeria, South Africa and Kenya. Following a detailed theoretical review and empirical analyses, findings were made in line with the research questions as well as set and tested hypotheses. The study employed five models and used diagnostics tests namely – Unit root test, multicollinearity, Correlation and cointegration tests; regression tests, panel data analysis and causality testing techniques to test and analyze the data represented in table 4.1, 4.2 and 4.3; and the subsequent tests results in tables 4.4A to table 4.13. The findings are hereby discussed below in line with the objectives of this study.

Objective One: To examine the relationship between money supply and stock market performance (proxy by market capitalization) of selected African developing economies.

The result of the panel data regression analysis revealed that Money supply (M2) has a negative but significant relational effect on Market Capitalization in selected developing African economies. The study showed that past levels of money supply (M2) have a negative (t-statistic of -13.91157) but significant relationship with (p-value of 0.0000) market capitalization at the 5% level of significance. The coefficient of the past levels of M2 has a negative sign (-1.115039%) at the chosen level of significance. This implies that a 1% increase in past levels of M2 will result to a -1.11504% decline in market capitalization. The result of this study suppot the findings of single country studies in Seong (2013), Agbonlahor (2014), Muktadir-AI-Mukit and

Shafiullah (2012), Cagli, Halac and Taskin (2010) and Lithman (2012) who found a significant but positive effect of money supply on stock market performance. This also contradicts our theory the Tobin's theory of monetary policy and our apriori expectations of a positive influence but uphold the significance of the expected impact.

A plausible direct interpretation of this result is that the monetary policy in the selected developing African economies have overtime had effective money supply direction into the economy but hoarding of money in the economy which would have bolstered the market performance index positively have necessitated negative impact in market capitalization.

It is also important to note that in the individual country analysis in Nigeria and Kenya showed positively significant effect of M2 on market capitalization except for South African positively insignificant relational effect on market capitalization. The diagnostic and cointegration tests revealed that the variables were stationery at first difference and there were evidence of cointegration. This result conforms to individual countries study findings mentioned earlier. Thus, the effect of M2 collective for the selected developing African economies has negative but significant relational effect on market capitalization.

Objective Two: To analyze the relationship between deposit monetary banks total credit and stock market performance of selected developing African economies.

The result of the panel data analysis shows that deposit monetary banks total credit has a positive and significant effect on stock market performance proxy by Market capitalization in the selected developing African economies. The study showed that past levels of total banks credit (TBC) has a positive (t-statistic of 135.6322) and statistically significant effect (p-value of 0.0000) on stock market performance at the 5% level of significance. The coefficient of the past levels of TBC has a positive sign (0677221%) at the chosen level of significance. This result indicates that the coefficient of the past levels of TBC has a positive sign and impressive effect

on market capitalization at the 5% level of significance. This implies that a 1% increase in past levels of TBC will result to a 0.677221% increase in stock market performance index represented by market capitalization. The result of this study is corroborated by the study of Uddin and Alam (2007), Ishfaq, Ramiz and Awais (2010), Emecheta and Ibe (2014) and Yakubu and Affoi (2014), whose study found a positive and significant effect of bank credit on stock market performance and economic growth. This findings support our theory the Tobin's theory of monetary policy and our apriori expectations of a positive and significant effect in the selected developing African economies.

Similarly, a cascaded test of this objective on individual study country basis revealed a negative and statistically insignificant effect of TBC on stock market performance in Nigeria which was supported by the findings of Chirchir (2014). However, the findings of Kenya showed both positive and statistically significant output corroborating the panel data output, but the South African result reveal negative but significant effect of TBC on market capitalization. A reasonable direct interpretation of this result is that deposit monetary banks total credit improve the overall stock market performance of the selected developing African economies and government monetary policies in Nigeria and Kenya should proffer interest rates that will improve banks credit facilities which will boost stock market performance and economic growth at large.

Objective Three: To asses the relationship between consumer price index and stock market performance of selected African developing economies

The result of the panel data studies shows that consumer price index has a negative and statistically insignificant effect on market capitalization in the selected developing African economies. The study showed that past levels of CPI has a positive (t-statistic of 4.840256) and statistically significant effect (p-value of 0.0000) on market capitalization at the chosen 5% level

of significance. The coefficient of the past levels of CPI has a positive sign (2.4708%) at the level of significance. This result indicates that the coefficient of the past levels of CPI has a positive sign and increasing effect on market capitalization at the 5% level of significance. This implies that a 1% increase in past levels of CPI will result to a 2.4708% increase in market capitalization value. Thus, CPI has a positive and significant effect on stock market performance. The result of this study is contradicted by the study of Spyrou (2001), Abakah (2009) and Raymond (2009), whose studies found a negative and insignificant effect of CPI (inflation) on stock market performance. The Tobin's theory of monetary policy was supported and upheld by the findings of the study in the selected developing African economies case while the apriori expectation also was also supported positive and significance effect of the study agree with apriori expectation of positive effect.

Surprisingly, a cascaded test of this objective on individual study area revealed a negative and statistically insignificant effect of CPI on market capitalization for Nigeria and South Africa while only Kenya study indicate positive but statistically insignificant effect of CPI on market capitalization.

Adopting the panel data results above for our purpose of study, CPI have both positive and significant relational effect on market capitalization in the selected developing African economies. A conceiveable direct interpretation of this result is that CPI (inflationary pressure) in the selected developing African economies does stimulate stock market performance.

Objective Four: To ascertain the relationship between foreign exchange and stock market performance of selected developing African economies

The result of the panel data regression studies show that foreign exchange (exchange rate) has a negative but significant relational effect on market capitalization in the selected developing African economies. The study showed that past levels of foreign exchange had a

negative (t-statistic of -2.262984) and statistically significant effect (p-value of 0.0262) on market capitalization at the 5% level of significance. The coefficient of the future levels of EX has a negative sign at the chosen level of significance. This implies that a 1% increase in future levels of EX will result to a decreasing relational effect in market capitalization. Thus, this shows that EX has a negative but significant relational effect on stock market performance in the selected developing African economies. The result of this study is contradicted by the findings of Raymond (2009), Li and Huang (2008) and Aydemir and Demirhan (2009), who found a statistically insignificant effect of EX on stock market performance index in market capitalization. These findings seem not to be support by the theoretical foundation of the Tobin's theory of monetary policy, however the outcome of this study agrees with our A-priori expectation of a significant relationship.

A probable direct interpretation of this result is that the efforts of monetary authorities in managing the foreign exchange rate to the US dollar in the selected developing African economies is not efficient as the domestic currency continuously loose grounds to the US dollars. It is also imperative to mention that in the individual country analysis, while Nigeria and Kenya showed positive but insignificant relationship, South Africa showed both positive and significant relationship of EX and market capitalization.

Objective Five: To ascertain the direction of causality between monetary policy and stock market performance of selected developing African economies

The result of the granger causality of Monetary policy considered in M2, TBC, CPI and EX against stock market performance index in market capitalization carried out at the 5% level of significance using a lag of 2 period reveals that that M2 and MC for the panel pooled data, does not Granger Cause each other with F-statistics of 0.81417 and 0.22230 with p-values of 0.4466 and 0.8012 respectively above the 5% level of significance. This shows that though the

relationship is positive, they are however not statistically significant. Similarly, EX does not granger cause MC nor does MC granger cause EX as the F-statistic is positive at 0.04959 and 2.20357 with p-values of 0.9516 and 0.1169 respectively which are well above the chosen level of significance; hence, EX has a positive but insignificant influence on MC and vice versa at the 5% significant level. This shows that though the relationship is positive, they are however not statistically significant. However, there were presence of uni-directional granger effect from MC to CPI and TBC to MC with F-statistics of 3.73880 and 7.84512 backed with p-value of 0.0279 and 0.0008 respectively. This result is consistent with the findings of Aydemir and Demirhan (2009), who found non-causal relationship between monetary policy and stock market performance indicators but contradicted by Hamrita and Abdelkader (2011) who discovered a bidirectional granger effect of monetary policy and stock market performance. This result however is not consistent with our Tobin's theory and Apriori expectation from such an investigation of a positive, significant and Bi-directional relationship between monetary policy and stock market performance.

The result of the individual country however, shows a departure from above scenario as in Nigeria, showed a uni-directional causal effect (relationship) from CPI to MC and MC to EX. While the rest showed no causal relationship between MC-TBC and MC-M2. South Africa however showed three (3) unidirectional causal effects from MC to CPI, MC to M2 and TBC to MC with p-values of 0.0119, 0.0610 and 0.1095 respectively. Kenya showed two (2) Bi-directional Causal effects between MC-CPI and MC-TBC while MC to M2 showed a uni-directional causal effect.

The panel data analysis result on pairwise granger causality does not support the Tobin's theory of monetary policy and our a-priori expectations. The implication of this panel result is

that the selected developing African economies is yet to productively use its monetary policy to develop the performance of stock markets and most money supply are tied down into sulk-aways, buried and some deposited in foreign accounts. Another implication of this result is that the monetary policies reduce monetary flows within the economy which affect stock market performance index.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The findings from the specific objectives of this study revealed that:

1. Money supply had a negative but significant relational effect on Market Capitalization in selected developing African economies.
2. Deposit monetary banks total credit had a positive and significant effect on stock market performance proxied by Market capitalization in the selected developing African economies.
3. Consumer price index had a positive and statistically significant effect on market capitalization in the selected developing African economies.
4. Foreign exchange rate had a negative but statistically significant relational effect on market capitalization in the selected developing African economies.
5. Monetary policy had no granger effect on stock market performance index proxy by market capitalization in the selected developing African economies and vice versa.

5.2 Conclusion

This research work studied the interaction between monetary policy and stock market performance in selected developing African economies following largely from the theoretical postulation of Tobin's theory. The theory holds that monetary policy benefits and develops stock market performance, which constituted the focus of this work. Arguments in favour of the monetary policy and stock market performance and contradictions to the postulations were reviewed from theoretical and empirical literature. Even lines of argument which suggests that stock market performance depends on direction, availability and volume of money supply within

the selected developing African economies understudy were also reviewed. Empirical analysis unbundled stock market performance index into Market capitalization, market turnover ratio, number of listed shares, value of stock traded and all share index in measuring the effect and the study anchor its stock market performance on market capitalization. The apparent flow of money supply influenced by monetary policy over the years undoubtably determines the reality of the analytical findings of the study.

The need to domesticate the study of this effects to our selected developing African economies, contribute to current literature on subject, validate other scholars view point and use a more dynamic and robust analytical tool that captured the panel and time series nature of the data involved motivated this study.

It was against the foregoing that the study chose a broad objective of examining the interaction between monetary policy and stock market performance proxied by market capitalization with evidence from selected developing African economies focusing on three major economies namely – Nigeria, South Africa and Kenya.

The results emanating from our study proved that monetary policy had significant relational effects on stock market performance. While, the stock market performance index in market capitalization also showed no corresponding effect on monetary policy in the selected developing African economies. In conclusion, based on the outcome of our Study, we affirm that monetary policy had significant relational effect on stock market performance in the selected developing African economies in both short-run and long-run equilibrium periods.

5.3 Recommendations

In line with the objectives of this study, we summarize our recommendations as follows:

1. The apex monetary regulatory authority should facilitate money supply that will enhance economic activities and stock market performance by ensuring that money is avoidably

not buried, hoarded, eliminate loop holes that reduce money supply which will ease funds for doing business, etc. and improve activities in the stock markets.

2. The governments monetary agency should also ensure interest rate of deposit money banks credit are reduced drastically by advocating reduction of monetary policy rate (MPR) to encourage loan activities and boost money supply via the stock market for economic development which will improve stock market performance in Market capitalization.
3. The regulatory authorities should manage consumer price index of their countries to an acceptable rate (to a single digit) so as to improve the welfare and economic growth of the domestic economy thereby growing the stock market. This will be evidenced by an increase in the number of stock market activities and market capitalization.
4. The regulatory authorities are advised to manage the foreign exchange rate by ensuring that foreign exchange rate appreciate to the US dollar against its continuous depreciation which leads to continuous expatriation of investable funds into the stock market of foreign economies to take advantage of the falling foreign exchange rate in the future.
5. The respective governments of the selected developing economies should be encouraged to consolidate their monetary policy to strengthen and deepen monetary control efforts to improve economic situations and stock market activities in Africa by establishing regional global stock market that is electronically linked to all stock markets. This will facilitate speedy developments of the stock markets; encourage the development of single regional trading currency, improved ease of liquidity flow between the various markets within the region, encourage improved transparent corporate governance, greater foreign investor participation and reduce capital flight into foreign stock markets. This will

enable capital inflows into the financial systems to be channeled appropriately towards the development of relevant market fundamentals.

5.4 Contributions to Knowledge

The study empirically proves that monetary policy had no significant effect on stock market performance in the selected developing Africa economies which validates the objective of this study.

1. This work contributes to current literature on subject matter from a panel study of selected developing African economies.
2. This work further validates the findings of some erudite researchers such as Spyrou (2001) and Abakah (2009) that monetary policy had no significant effects on stock market performance.
3. Most reviewed literature employed an individual variable of stock prices, market turnover ratio, value of stock traded or number of listed shares. This work however employed rarely used variable in market capitalization to measure stock market performance.

5.5 Recommendations for Further Studies

This study recommends the following for further studies:

1. The interaction between monetary policy and stock market performance; a comparative study of African and non-African developing economies.
2. Secondly, the research recommends a multiple regression study of monetary policy on stock market performance of Selected Developing African economies.

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Appendix

Nigeria

ADF Unit root test for Nigeria

Appendix i: Unit root test for NCPI

Null Hypothesis: D(NCPI,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.774813	0.0334
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NCPI,3)
Method: Least Squares
Date: 01/18/18 Time: 22:16
Sample (adjusted): 1989 2016
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NCPI(-1),2)	-1.035641	0.274356	-3.774813	0.0009
C	-0.806683	1.302114	-0.619518	0.5412
@TREND("1986")	0.102923	0.071014	1.449338	0.1597
R-squared	0.385071	Mean dependent var		0.410714
Adjusted R-squared	0.335876	S.D. dependent var		3.715367
S.E. of regression	3.027794	Akaike info criterion		5.154502
Sum squared resid	229.1884	Schwarz criterion		5.297239
Log likelihood	-69.16303	Hannan-Quinn criter.		5.198138
F-statistic	7.827537	Durbin-Watson stat		1.601134
Prob(F-statistic)	0.002293			

Appendix ii: Unit root for NEX

Null Hypothesis: D(NEX,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.678041	0.0000
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NEX,3)
Method: Least Squares
Date: 01/18/18 Time: 22:22
Sample (adjusted): 1989 2016
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NEX(-1),2)	-1.415204	0.184318	-7.678041	0.0000
C	-4.172133	7.370715	-0.566042	0.5764
@TREND("1986")	0.407434	0.402484	1.012299	0.3211
R-squared	0.702477	Mean dependent var		0.733875
Adjusted R-squared	0.678675	S.D. dependent var		30.20768
S.E. of regression	17.12339	Akaike info criterion		8.619725
Sum squared resid	7330.264	Schwarz criterion		8.762461

Log likelihood	-117.6762	Hannan-Quinn criter.	8.663361
F-statistic	29.51351	Durbin-Watson stat	2.061630
Prob(F-statistic)	0.000000		

Appendix iii: Unit Root for NM2

Null Hypothesis: D(NM2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.128074	0.0151
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NM2,2)
Method: Least Squares
Date: 01/18/18 Time: 22:29
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NM2(-1))	-0.888767	0.215298	-4.128074	0.0003
C	293058.5	3.22E+09	9.11E-05	0.9999
@TREND("1986")	1.49E+08	1.90E+08	0.781389	0.4416

R-squared	0.406462	Mean dependent var	-2.08E+08
Adjusted R-squared	0.360805	S.D. dependent var	9.90E+09
S.E. of regression	7.91E+09	Akaike info criterion	48.51883
Sum squared resid	1.63E+21	Schwarz criterion	48.66028
Log likelihood	-700.5231	Hannan-Quinn criter.	48.56313
F-statistic	8.902547	Durbin-Watson stat	1.884755
Prob(F-statistic)	0.001135		

Appendix iv Unit Root for NTBC

Null Hypothesis: D(NTBC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.144849	0.0001
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NTBC,2)
Method: Least Squares
Date: 01/18/18 Time: 22:33
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NTBC(-1))	-1.183223	0.192555	-6.144849	0.0000
C	-6.71E+09	1.60E+10	-0.420464	0.6776
@TREND("1986")	1.02E+09	8.97E+08	1.139741	0.2648

R-squared	0.592227	Mean dependent var	1.57E+09
Adjusted R-squared	0.560859	S.D. dependent var	5.99E+10
S.E. of regression	3.97E+10	Akaike info criterion	51.74323
Sum squared resid	4.09E+22	Schwarz criterion	51.88468

Log likelihood	-747.2769	Hannan-Quinn criter.	51.78753
F-statistic	18.88045	Durbin-Watson stat	2.012767
Prob(F-statistic)	0.000009		

Appendix v: Unit Root NMC

Null Hypothesis: D(NMC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.592662	0.0005
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NMC,2)
Method: Least Squares
Date: 01/18/18 Time: 22:44
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NMC(-1))	-1.125425	0.201232	-5.592662	0.0000
C	2.64E+09	6.47E+09	0.407589	0.6869
@TREND("1986")	-92476746	3.58E+08	-0.258069	0.7984

R-squared	0.547965	Mean dependent var	-6.33E+08
Adjusted R-squared	0.513193	S.D. dependent var	2.31E+10
S.E. of regression	1.61E+10	Akaike info criterion	49.94365
Sum squared resid	6.77E+21	Schwarz criterion	50.08509
Log likelihood	-721.1829	Hannan-Quinn criter.	49.98795
F-statistic	15.75883	Durbin-Watson stat	1.994420
Prob(F-statistic)	0.000033		

Appendix vi: Johansen Cointegration for Nigeria

Date: 01/18/18 Time: 22:51
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: NCPI NEX NM2 NMC NTBC
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.693904	91.10673	69.81889	0.0004
At most 1 *	0.630787	56.77487	47.85613	0.0058
At most 2	0.426693	27.87984	29.79707	0.0819
At most 3	0.273335	11.74617	15.49471	0.1695
At most 4	0.082176	2.486751	3.841466	0.1148

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.693904	34.33186	33.87687	0.0441

At most 1 *	0.630787	28.89503	27.58434	0.0338	
At most 2	0.426693	16.13367	21.13162	0.2171	
At most 3	0.273335	9.259418	14.26460	0.2652	
At most 4	0.082176	2.486751	3.841466	0.1148	
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level					
* denotes rejection of the hypothesis at the 0.05 level					
**MacKinnon-Haug-Michelis (1999) p-values					
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):					
NCPI	NEX	NM2	NMC	NTBC	
-0.357696	0.115151	3.62E-10	1.14E-10	-5.24E-11	
0.029186	0.007619	-1.35E-10	3.82E-11	6.03E-11	
0.119707	-0.032919	-8.87E-11	4.54E-11	-4.41E-12	
-0.058660	0.041601	1.81E-10	-1.23E-10	-1.72E-11	
-0.099963	0.005172	1.66E-10	-1.53E-11	-1.52E-11	
Unrestricted Adjustment Coefficients (alpha):					
D(NCPI)	-0.253969	1.132461	1.113646	0.443847	-0.025633
D(NEX)	-7.098972	3.628461	4.759318	-1.254533	-0.270629
D(NM2)	3.10E+09	-2.45E+08	-1.15E+09	1.88E+08	-6.50E+08
D(NMC)	-1.13E+09	-5.73E+09	-5.13E+09	3.60E+09	-2.20E+09
D(NTBC)	4.96E+09	-1.03E+10	1.83E+10	1.16E+09	-1.16E+09
1 Cointegrating Equation(s):		Log likelihood	-2283.532		
Normalized cointegrating coefficients (standard error in parentheses)					
NCPI	NEX	NM2	NMC	NTBC	
1.000000	-0.321925	-1.01E-09	-3.20E-10	1.47E-10	
	(0.01546)	(6.9E-11)	(6.6E-11)	(2.4E-11)	
Adjustment coefficients (standard error in parentheses)					
D(NCPI)	0.090844				
	(0.18202)				
D(NEX)	2.539272				
	(0.77335)				
D(NM2)	-1.11E+09				
	(2.7E+08)				
D(NMC)	4.05E+08				
	(1.1E+09)				
D(NTBC)	-1.77E+09				
	(2.4E+09)				
2 Cointegrating Equation(s):		Log likelihood	-2269.084		
Normalized cointegrating coefficients (standard error in parentheses)					
NCPI	NEX	NM2	NMC	NTBC	
1.000000	0.000000	-3.01E-09	5.79E-10	1.21E-09	
		(5.4E-10)	(5.1E-10)	(1.8E-10)	
0.000000	1.000000	-6.20E-09	2.79E-09	3.29E-09	
		(1.7E-09)	(1.6E-09)	(5.6E-10)	
Adjustment coefficients (standard error in parentheses)					
D(NCPI)	0.123895	-0.020616			
	(0.16076)	(0.05169)			
D(NEX)	2.645170	-0.789808			
	(0.72455)	(0.23299)			
D(NM2)	-1.12E+09	3.55E+08			
	(2.7E+08)	(8.8E+07)			
D(NMC)	2.38E+08	-1.74E+08			
	(1.0E+09)	(3.4E+08)			
D(NTBC)	-2.07E+09	4.93E+08			
	(2.3E+09)	(7.3E+08)			
3 Cointegrating Equation(s):		Log likelihood	-2261.017		
Normalized cointegrating coefficients (standard error in parentheses)					
NCPI	NEX	NM2	NMC	NTBC	

1.000000	0.000000	0.000000	3.62E-09	-6.03E-10
			(1.3E-09)	(4.3E-10)
0.000000	1.000000	0.000000	9.06E-09	-4.37E-10
			(2.7E-09)	(9.2E-10)
0.000000	0.000000	1.000000	1.010898	-0.601531
			(0.42680)	(0.14779)
Adjustment coefficients (standard error in parentheses)				
D(NCPI)	0.257206	-0.057276	-3.44E-10	
	(0.14370)	(0.04558)	(1.5E-10)	
D(NEX)	3.214893	-0.946479	-3.48E-09	
	(0.66032)	(0.20946)	(6.9E-10)	
D(NM2)	-1.25E+09	3.93E+08	1.257544	
	(2.7E+08)	(8.6E+07)	(0.28439)	
D(NMC)	-3.76E+08	-5166592.	0.817853	
	(1.0E+09)	(3.3E+08)	(1.07366)	
D(NTBC)	1.20E+08	-1.11E+08	1.558428	
	(1.9E+09)	(6.0E+08)	(1.97403)	
4 Cointegrating Equation(s):		Log likelihood	-2256.388	
Normalized cointegrating coefficients (standard error in parentheses)				
NCPI	NEX	NM2	NMC	NTBC
1.000000	0.000000	0.000000	0.000000	-2.91E-11
				(1.4E-10)
0.000000	1.000000	0.000000	0.000000	9.99E-10
				(2.8E-10)
0.000000	0.000000	1.000000	0.000000	-0.441270
				(0.05967)
0.000000	0.000000	0.000000	1.000000	-0.158533
				(0.06783)
Adjustment coefficients (standard error in parentheses)				
D(NCPI)	0.231170	-0.038812	-2.63E-10	1.02E-11
	(0.14084)	(0.04672)	(1.6E-10)	(6.6E-11)
D(NEX)	3.288484	-0.998668	-3.71E-09	-3.03E-10
	(0.66032)	(0.21907)	(7.5E-10)	(3.1E-10)
D(NM2)	-1.27E+09	4.01E+08	1.291547	0.269668
	(2.7E+08)	(9.1E+07)	(0.31224)	(0.12757)
D(NMC)	-5.87E+08	1.44E+08	1.469736	-1.023091
	(9.9E+08)	(3.3E+08)	(1.13236)	(0.46266)
D(NTBC)	52328074	-62741703	1.768137	0.864067
	(1.9E+09)	(6.3E+08)	(2.16804)	(0.88581)

Appendix vii: Ramsey RESET Test for Nigeria

Ramsey RESET Test			
Equation: UNTITLED			
Specification: NMC NCPI NEX NM2 NTBC C			
Omitted Variables: Squares of fitted values			
	Value	Df	Probability
t-statistic	1.372418	25	0.1821
F-statistic	1.883532	(1, 25)	0.1821
Likelihood ratio	2.251780	1	0.1335
F-test summary			
	Sum of Sq.	Df	Mean Squares
Test SSR	3.16E+20	1	3.16E+20
Restricted SSR	4.51E+21	26	1.74E+20
Unrestricted SSR	4.20E+21	25	1.68E+20
LR test summary:			
	Value	Df	

Restricted LogL	-763.6127	26		
Unrestricted LogL	-762.4868	25		
Unrestricted Test Equation:				
Dependent Variable: NMC				
Method: Least Squares				
Date: 01/19/18 Time: 22:10				
Sample: 1986 2016				
Included observations: 31				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NCPI	-5.43E+08	3.62E+08	-1.501154	0.1458
NEX	2.06E+08	1.41E+08	1.462914	0.1560
NM2	2.145910	0.785194	2.732969	0.0114
NTBC	-0.282641	0.121645	-2.323481	0.0286
C	1.30E+09	5.88E+09	0.221013	0.8269
FITTED^2	-1.21E-11	8.84E-12	-1.372418	0.1821
R-squared	0.777894	Mean dependent var		2.22E+10
Adjusted R-squared	0.733473	S.D. dependent var		2.51E+10
S.E. of regression	1.30E+10	Akaike info criterion		49.57980
Sum squared resid	4.20E+21	Schwarz criterion		49.85734
Log likelihood	-762.4868	Hannan-Quinn criter.		49.67027
F-statistic	17.51178	Durbin-Watson stat		1.820700
Prob(F-statistic)	0.000000			

South Africa

ADF Unit root test for South Africa

Appendix viii: Unit root test for SACPI

Null Hypothesis: D(SACPI) has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.732206	0.0366
Test critical values:	1% level		-4.323979	
	5% level		-3.580623	
	10% level		-3.225334	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(SACPI,2)				
Method: Least Squares				
Date: 08/25/18 Time: 22:22				
Sample (adjusted): 1989 2016				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SACPI(-1))	-0.804663	0.215600	-3.732206	0.0010
D(SACPI(-1),2)	0.378153	0.200991	1.881445	0.0721
C	1.326266	0.659109	2.012211	0.0556
@TREND("1986")	0.129027	0.042885	3.008649	0.0061
R-squared	0.371608	Mean dependent var		0.225000
Adjusted R-squared	0.293059	S.D. dependent var		1.527192
S.E. of regression	1.284059	Akaike info criterion		3.469494
Sum squared resid	39.57141	Schwarz criterion		3.659809
Log likelihood	-44.57291	Hannan-Quinn criter.		3.527675
F-statistic	4.730909	Durbin-Watson stat		1.824144
Prob(F-statistic)	0.009886			

Appendix ix: Unit root test for SATBC

Null Hypothesis: D(SATBC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.092162	0.0001
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SATBC,2)
Method: Least Squares
Date: 01/18/18 Time: 21:45
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SATBC(-1))	-1.174111	0.192725	-6.092162	0.0000
C	2.72E+10	2.20E+10	1.238991	0.2264
@TREND("1986")	1.21E+09	1.22E+09	0.997588	0.3277

R-squared	0.588094	Mean dependent var	1.84E+09
Adjusted R-squared	0.556409	S.D. dependent var	8.11E+10
S.E. of regression	5.40E+10	Akaike info criterion	52.35998
Sum squared resid	7.58E+22	Schwarz criterion	52.50143
Log likelihood	-756.2197	Hannan-Quinn criter.	52.40428
F-statistic	18.56063	Durbin-Watson stat	2.052474
Prob(F-statistic)	0.000010		

Appendix x: Unit root for SAEX

Null Hypothesis: D(SAEX) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.887752	0.0026
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SAEX,2)
Method: Least Squares
Date: 01/18/18 Time: 21:11
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SAEX(-1))	-0.906936	0.185553	-4.887752	0.0000
C	-0.915101	3.133917	-0.291999	0.7726
@TREND("1986")	-0.036940	0.174719	-0.211424	0.8342

R-squared	0.480705	Mean dependent var	-0.658621
Adjusted R-squared	0.440759	S.D. dependent var	10.43892
S.E. of regression	7.806475	Akaike info criterion	7.045481
Sum squared resid	1584.467	Schwarz criterion	7.186926
Log likelihood	-99.15948	Hannan-Quinn criter.	7.089780
F-statistic	12.03395	Durbin-Watson stat	1.798426
Prob(F-statistic)	0.000200		

Appendix xi: Unit root for SAM2

Null Hypothesis: D(SAM2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.181972	0.0138
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SAM2,2)
Method: Least Squares
Date: 01/18/18 Time: 21:15
Sample (adjusted): 1989 2016
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SAM2(-1))	-0.967824	0.231428	-4.181972	0.0003
D(SAM2(-1),2)	0.388182	0.194493	1.995871	0.0574
C	-9.34E+08	6.91E+08	-1.350378	0.1895
@TREND("1986")	1.44E+08	46392506	3.106132	0.0048

R-squared	0.432256	Mean dependent var	1.91E+08
Adjusted R-squared	0.361288	S.D. dependent var	1.94E+09
S.E. of regression	1.55E+09	Akaike info criterion	45.29796
Sum squared resid	5.80E+19	Schwarz criterion	45.48827
Log likelihood	-630.1714	Hannan-Quinn criter.	45.35614
F-statistic	6.090859	Durbin-Watson stat	2.006276
Prob(F-statistic)	0.003115		

Appendix xii: Unit root for SAMC

Null Hypothesis: D(SAMC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.606772	0.0000
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SAMC,2)
Method: Least Squares
Date: 01/18/18 Time: 21:30
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SAMC(-1))	-1.257742	0.190372	-6.606772	0.0000
C	1.92E+10	4.93E+10	0.389949	0.6998
@TREND("1986")	6.31E+08	2.72E+09	0.231588	0.8187

R-squared	0.626944	Mean dependent var	1.87E+09
Adjusted R-squared	0.598247	S.D. dependent var	1.94E+11
S.E. of regression	1.23E+11	Akaike info criterion	54.00216
Sum squared resid	3.92E+23	Schwarz criterion	54.14361
Log likelihood	-780.0313	Hannan-Quinn criter.	54.04646
F-statistic	21.84727	Durbin-Watson stat	2.124970

Prob(F-statistic)	0.000003

Appendix xiii: Johansen Cointegration for SA

Date: 01/18/18 Time: 22:02
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: SACPI SAEX SAM2 SAMC SATBC
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.704339	88.53978	69.81889	0.0008
At most 1 *	0.630948	53.20209	47.85613	0.0145
At most 2	0.325021	24.29441	29.79707	0.1883
At most 3	0.280238	12.89528	15.49471	0.1187
At most 4	0.109373	3.359071	3.841466	0.0668

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.704339	35.33769	33.87687	0.0333
At most 1 *	0.630948	28.90768	27.58434	0.0337
At most 2	0.325021	11.39914	21.13162	0.6075
At most 3	0.280238	9.536206	14.26460	0.2442
At most 4	0.109373	3.359071	3.841466	0.0668

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

SACPI	SAEX	SAM2	SAMC	SATBC
-0.000688	0.083086	1.07E-10	-6.72E-12	9.25E-12
0.231352	-0.160184	-1.65E-10	2.23E-11	-3.87E-11
0.065087	0.056967	4.93E-11	-1.44E-11	4.41E-12
-0.115496	-0.158172	2.52E-10	7.84E-12	-4.63E-12
0.005883	-0.079327	-3.99E-10	5.84E-12	5.46E-12

Unrestricted Adjustment Coefficients (alpha):

D(SACPI)	0.458748	-0.236836	-0.431900	0.152370	-0.052507
D(SAEX)	-1.273490	-1.057570	1.865031	1.911089	0.518608
D(SAM2)	8.05E+08	2.84E+08	-2.50E+08	32351680	-1.02E+08
D(SAMC)	1.58E+10	-4.67E+10	4.79E+10	-1.50E+10	1.13E+10
D(SATBC)	1.86E+10	-8.15E+08	1.38E+10	-9.86E+09	1.12E+10

1 Cointegrating Equation(s): Log likelihood -2260.697

Normalized cointegrating coefficients (standard error in parentheses)

SACPI	SAEX	SAM2	SAMC	SATBC
1.000000	-120.7739	-1.56E-07	9.77E-09	-1.34E-08
	(50.6746)	(9.0E-08)	(5.3E-09)	(5.4E-09)

Adjustment coefficients (standard error in parentheses)

D(SACPI)	-0.000316
	(0.00014)
D(SAEX)	0.000876
	(0.00079)
D(SAM2)	-553839.5
	(122007.)

D(SAMC)	-10882268			
	(1.6E+07)			
D(SATBC)	-12794529			
	(6929643)			
2 Cointegrating Equation(s):		Log likelihood	-2246.243	
Normalized cointegrating coefficients (standard error in parentheses)				
SACPI	SAEX	SAM2	SAMC	SATBC
1.000000	0.000000	1.79E-10	4.05E-11	-9.07E-11
		(6.0E-10)	(1.6E-11)	(2.0E-11)
0.000000	1.000000	1.29E-09	-8.06E-11	1.11E-10
		(7.4E-10)	(2.0E-11)	(2.4E-11)
Adjustment coefficients (standard error in parentheses)				
D(SACPI)	-0.055108	0.076053		
	(0.04420)	(0.03448)		
D(SAEX)	-0.243795	0.063597		
	(0.25879)	(0.20185)		
D(SAM2)	65198225	21363609		
	(3.9E+07)	(3.0E+07)		
D(SAMC)	-1.08E+10	8.79E+09		
	(5.0E+09)	(3.9E+09)		
D(SATBC)	-2.01E+08	1.68E+09		
	(2.3E+09)	(1.8E+09)		
3 Cointegrating Equation(s):		Log likelihood	-2240.544	
Normalized cointegrating coefficients (standard error in parentheses)				
SACPI	SAEX	SAM2	SAMC	SATBC
1.000000	0.000000	0.000000	-2.17E-11	-7.07E-11
			(1.9E-11)	(1.6E-11)
0.000000	1.000000	0.000000	-5.30E-10	2.55E-10
			(1.4E-10)	(1.2E-10)
0.000000	0.000000	1.000000	0.348530	-0.111938
			(0.11450)	(0.09943)
Adjustment coefficients (standard error in parentheses)				
D(SACPI)	-0.083219	0.051449	6.70E-11	
	(0.04023)	(0.03168)	(3.4E-11)	
D(SAEX)	-0.122406	0.169841	1.30E-10	
	(0.25128)	(0.19785)	(2.1E-10)	
D(SAM2)	48900865	7099425.	0.026866	
	(3.8E+07)	(3.0E+07)	(0.03206)	
D(SAMC)	-7.70E+09	1.15E+10	11.77303	
	(4.6E+09)	(3.6E+09)	(3.89959)	
D(SATBC)	6.98E+08	2.46E+09	2.806170	
	(2.3E+09)	(1.8E+09)	(1.95533)	
4 Cointegrating Equation(s):		Log likelihood	-2235.776	
Normalized cointegrating coefficients (standard error in parentheses)				
SACPI	SAEX	SAM2	SAMC	SATBC
1.000000	0.000000	0.000000	0.000000	-7.80E-11
				(6.6E-12)
0.000000	1.000000	0.000000	0.000000	7.73E-11
				(1.4E-11)
0.000000	0.000000	1.000000	0.000000	0.004849
				(0.00586)
0.000000	0.000000	0.000000	1.000000	-0.335083
				(0.14310)
Adjustment coefficients (standard error in parentheses)				
D(SACPI)	-0.100817	0.027349	1.05E-10	-9.27E-13
	(0.04379)	(0.04050)	(5.3E-11)	(4.7E-12)
D(SAEX)	-0.343129	-0.132439	6.12E-10	-2.70E-11

	(0.25675)	(0.23748)	(3.1E-10)	(2.7E-11)
D(SAM2)	45164377	1982295.	0.035026	0.004790
	(4.2E+07)	(3.9E+07)	(0.05108)	(0.00449)
D(SAMC)	-5.96E+09	1.39E+10	7.983539	-1.956468
	(5.1E+09)	(4.7E+09)	(6.13232)	(0.53956)
D(SATBC)	1.84E+09	4.02E+09	0.318981	-0.419965
	(2.5E+09)	(2.3E+09)	(3.04334)	(0.26777)

Appendix xiv: Ramsey RESET for SA

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(SAMC) SACPI SAEX SAM2 SATBC C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.975568	25	0.3386
F-statistic	0.951734	(1, 25)	0.3386
Likelihood ratio	1.158240	1	0.2818

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.025237	1	0.025237
Restricted SSR	0.688152	26	0.026467
Unrestricted SSR	0.662915	25	0.026517

LR test summary:

	Value	Df
Restricted LogL	15.03277	26
Unrestricted LogL	15.61189	25

Unrestricted Test Equation:
Dependent Variable: LOG(SAMC)
Method: Least Squares
Date: 01/19/18 Time: 22:56
Sample: 1986 2016
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SACPI	0.004205	0.006141	0.684819	0.4998
SAEX	0.110725	0.094783	1.168196	0.2537
SAM2	-9.25E-11	7.87E-11	-1.175421	0.2509
SATBC	1.63E-11	1.40E-11	1.168256	0.2537
C	72.02936	50.22382	1.434167	0.1639
FITTED^2	-0.094513	0.096880	-0.975568	0.3386

R-squared	0.960592	Mean dependent var	26.52151
Adjusted R-squared	0.952711	S.D. dependent var	0.748819
S.E. of regression	0.162839	Akaike info criterion	-0.620122
Sum squared resid	0.662915	Schwarz criterion	-0.342576
Log likelihood	15.61189	Hannan-Quinn criter.	-0.529649
F-statistic	121.8784	Durbin-Watson stat	2.081486
Prob(F-statistic)	0.000000		

Kenya

ADF Unit root test for Kenya

Appendix xv: Unit root KCPI

Null Hypothesis: D(KCPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.720507	0.0038
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KCPI,2)
Method: Least Squares
Date: 01/18/18 Time: 11:08
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KCPI(-1))	-0.924186	0.195781	-4.720507	0.0001
C	-0.347858	1.261920	-0.275658	0.7850
@TREND("1986")	0.329531	0.098870	3.332963	0.0026

R-squared	0.461529	Mean dependent var	0.306897
Adjusted R-squared	0.420108	S.D. dependent var	4.106522
S.E. of regression	3.127142	Akaike info criterion	5.215813
Sum squared resid	254.2544	Schwarz criterion	5.357258
Log likelihood	-72.62929	Hannan-Quinn criter.	5.260112
F-statistic	11.14244	Durbin-Watson stat	1.979866
Prob(F-statistic)	0.000320		

Null Hypothesis: D(KEX) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.189037	0.0012
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KEX,2)
Method: Least Squares
Date: 01/18/18 Time: 11:13
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KEX(-1))	-1.011179	0.194868	-5.189037	0.0000
C	4.330558	2.637587	1.641864	0.1127
@TREND("1986")	-0.089158	0.140688	-0.633734	0.5318

R-squared	0.509097	Mean dependent var	0.044828
Adjusted R-squared	0.471335	S.D. dependent var	8.686426
S.E. of regression	6.315844	Akaike info criterion	6.621697
Sum squared resid	1037.137	Schwarz criterion	6.763141
Log likelihood	-93.01461	Hannan-Quinn criter.	6.665996

F-statistic	13.48180	Durbin-Watson stat	2.016196
Prob(F-statistic)	0.000096		

Appendix xvi: Unit root KM2

Null Hypothesis: D(KM2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.009993	0.0197
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KM2,2)
Method: Least Squares
Date: 01/18/18 Time: 19:18
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KM2(-1))	-0.821232	0.204796	-4.009993	0.0005
C	-3.59E+08	3.65E+08	-0.984862	0.3338
@TREND("1986")	67356664	26603843	2.531840	0.0177

R-squared	0.384133	Mean dependent var	11859981
Adjusted R-squared	0.336758	S.D. dependent var	1.05E+09
S.E. of regression	8.59E+08	Akaike info criterion	44.07801
Sum squared resid	1.92E+19	Schwarz criterion	44.21945
Log likelihood	-636.1311	Hannan-Quinn criter.	44.12230
F-statistic	8.108450	Durbin-Watson stat	1.947929
Prob(F-statistic)	0.001834		

Null Hypothesis: D(KTBC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.114428	0.0015
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KTBC,2)
Method: Least Squares
Date: 01/18/18 Time: 19:21
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KTBC(-1))	-1.040640	0.203471	-5.114428	0.0000
C	-5.45E+08	6.96E+08	-0.783226	0.4406
@TREND("1986")	1.36E+08	47512679	2.854588	0.0084

R-squared	0.502621	Mean dependent var	32415172
Adjusted R-squared	0.464361	S.D. dependent var	2.32E+09
S.E. of regression	1.69E+09	Akaike info criterion	45.43705
Sum squared resid	7.47E+19	Schwarz criterion	45.57850
Log likelihood	-655.8372	Hannan-Quinn criter.	45.48135

F-statistic	13.13700	Durbin-Watson stat	1.947510
Prob(F-statistic)	0.000114		

Appendix xvii: Unit root KMC

Null Hypothesis: D(KMC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.755762	0.0000
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KMC,2)
Method: Least Squares
Date: 01/18/18 Time: 19:30
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KMC(-1))	-1.333359	0.197366	-6.755762	0.0000
C	1.83E+08	1.10E+09	0.166317	0.8692
@TREND("1986")	31599948	61556364	0.513350	0.6120

R-squared	0.638760	Mean dependent var	-1.35E+08
Adjusted R-squared	0.610972	S.D. dependent var	4.39E+09
S.E. of regression	2.74E+09	Akaike info criterion	46.39622
Sum squared resid	1.95E+20	Schwarz criterion	46.53767
Log likelihood	-669.7452	Hannan-Quinn criter.	46.44052
F-statistic	22.98713	Durbin-Watson stat	2.059707
Prob(F-statistic)	0.000002		

Appendix xviii: Johansen Cointegration

Date: 01/18/18 Time: 19:43
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: KCPI KEX KM2 KTBC KMC
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.698187	88.11952	69.81889	0.0009
At most 1 *	0.619415	53.37900	47.85613	0.0139
At most 2	0.515450	25.36371	29.79707	0.1488
At most 3	0.138867	4.352177	15.49471	0.8732
At most 4	0.000569	0.016498	3.841466	0.8977

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.698187	34.74053	33.87687	0.0394
At most 1 *	0.619415	28.01529	27.58434	0.0440

At most 2	0.515450	21.01153	21.13162	0.0520	
At most 3	0.138867	4.335679	14.26460	0.8223	
At most 4	0.000569	0.016498	3.841466	0.8977	
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level					
* denotes rejection of the hypothesis at the 0.05 level					
**MacKinnon-Haug-Michelis (1999) p-values					
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):					
KCPI	KEX	KM2	KTBC	KMC	
-0.272860	0.149241	2.00E-09	-6.57E-10	3.92E-10	
-0.173169	0.072049	1.56E-09	-2.32E-10	-6.84E-10	
-0.084079	-0.037355	-1.37E-09	9.28E-10	4.65E-10	
0.068355	-0.103317	-6.63E-10	2.38E-10	1.97E-11	
0.038219	-0.063722	-5.67E-10	3.90E-10	2.56E-10	
Unrestricted Adjustment Coefficients (alpha):					
D(KCPI)	0.318115	-1.148701	0.975931	-0.167459	-0.038635
D(KEX)	0.892276	0.996681	-0.526436	1.550341	-0.077230
D(KM2)	-3.23E+08	-3.58E+08	-43495468	-41510598	9791376.
D(KTBC)	1.26E+08	-1.43E+08	-7.89E+08	-1.29E+08	1959947.
D(KMC)	-1.73E+09	87856623	88979538	-1.64E+08	7672499.
1 Cointegrating Equation(s):		Log likelihood	-2067.291		
Normalized cointegrating coefficients (standard error in parentheses)					
KCPI	KEX	KM2	KTBC	KMC	
1.000000	-0.546952	-7.32E-09	2.41E-09	-1.44E-09	
	(0.05957)	(1.0E-09)	(5.9E-10)	(4.9E-10)	
Adjustment coefficients (standard error in parentheses)					
D(KCPI)	-0.086801				
	(0.15224)				
D(KEX)	-0.243467				
	(0.32012)				
D(KM2)	87997637				
	(3.8E+07)				
D(KTBC)	-34385084				
	(6.8E+07)				
D(KMC)	4.73E+08				
	(7.4E+07)				
2 Cointegrating Equation(s):		Log likelihood	-2053.284		
Normalized cointegrating coefficients (standard error in parentheses)					
KCPI	KEX	KM2	KTBC	KMC	
1.000000	0.000000	-1.43E-08	-2.06E-09	2.11E-08	
		(5.7E-09)	(2.7E-09)	(3.9E-09)	
0.000000	1.000000	-1.28E-08	-8.17E-09	4.11E-08	
		(1.1E-08)	(5.1E-09)	(7.5E-09)	
Adjustment coefficients (standard error in parentheses)					
D(KCPI)	0.112118	-0.035287			
	(0.16201)	(0.08308)			
D(KEX)	-0.416061	0.204974			
	(0.37288)	(0.19121)			
D(KM2)	1.50E+08	-73902961			
	(3.8E+07)	(2.0E+07)			
D(KTBC)	-9627911.	8506466.			
	(8.0E+07)	(4.1E+07)			
D(KMC)	4.57E+08	-2.52E+08			
	(8.8E+07)	(4.5E+07)			
3 Cointegrating Equation(s):		Log likelihood	-2042.778		
Normalized cointegrating coefficients (standard error in parentheses)					
KCPI	KEX	KM2	KTBC	KMC	
1.000000	0.000000	0.000000	-4.17E-09	3.35E-09	

			(4.1E-10)	(1.1E-09)
0.000000	1.000000	0.000000	-1.01E-08	2.53E-08
			(1.5E-09)	(4.0E-09)
0.000000	0.000000	1.000000	-0.147435	-1.236132
			(0.06161)	(0.16438)
Adjustment coefficients (standard error in parentheses)				
D(KCPI)	0.030063	-0.071742	-2.49E-09	
	(0.15230)	(0.07748)	(1.3E-09)	
D(KEX)	-0.371799	0.224639	4.06E-09	
	(0.38346)	(0.19508)	(3.3E-09)	
D(KM2)	1.54E+08	-72278192	-1.141992	
	(3.9E+07)	(2.0E+07)	(0.33970)	
D(KTBC)	56727056	37986972	1.108285	
	(6.1E+07)	(3.1E+07)	(0.52517)	
D(KMC)	4.50E+08	-2.55E+08	-3.443923	
	(9.0E+07)	(4.6E+07)	(0.77762)	
4 Cointegrating Equation(s):		Log likelihood	-2040.610	
Normalized cointegrating coefficients (standard error in parentheses)				
KCPI	KEX	KM2	KTBC	KMC
1.000000	0.000000	0.000000	0.000000	-7.42E-09
				(1.9E-09)
0.000000	1.000000	0.000000	0.000000	-6.77E-10
				(4.3E-09)
0.000000	0.000000	1.000000	0.000000	-1.616791
				(0.16453)
0.000000	0.000000	0.000000	1.000000	-2.581883
				(0.51244)
Adjustment coefficients (standard error in parentheses)				
D(KCPI)	0.018617	-0.054441	-2.38E-09	9.23E-10
	(0.15498)	(0.09040)	(1.3E-09)	(5.4E-10)
D(KEX)	-0.265825	0.064463	3.03E-09	-9.37E-10
	(0.37485)	(0.21866)	(3.2E-09)	(1.3E-09)
D(KM2)	1.51E+08	-67989448	-1.114467	0.244766
	(4.0E+07)	(2.3E+07)	(0.34761)	(0.13941)
D(KTBC)	47885500	51350698	1.194052	-0.812749
	(6.1E+07)	(3.6E+07)	(0.53273)	(0.21365)
D(KMC)	4.39E+08	-2.39E+08	-3.335382	1.161615
	(9.1E+07)	(5.3E+07)	(0.79129)	(0.31735)

Panel unit root

Appendix xix: Panel Unit root for CPI

Null Hypothesis: Unit root (common unit root process)		
Series: D(CPI)		
Date: 01/21/18 Time: 13:53		
Sample: 1986 2016		
Exogenous variables: Individual effects, individual linear trends		
User-specified lags: 1		
Newey-West automatic bandwidth selection and Bartlett kernel		
Total (balanced) observations: 84		
Cross-sections included: 3		
Method	Statistic	Prob.**
Levin, Lin & Chu t*	-1.45701	0.0726
** Probabilities are computed assuming asympotic normality		
Intermediate results on D(CPI)		

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
Nigeria	-0.60505	7.2542	3.3678	1	1	12.0	28
South Africa	-0.80466	1.4133	0.1436	1	1	25.0	28
Kenya	-1.03785	8.9416	3.9160	1	1	2.0	28
	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.83660	-5.886	1.007	-0.686	0.971		84

Appendix xx: Panel Unit root for EX

Null Hypothesis: Unit root (common unit root process)
Series: D(EX)
Date: 01/21/18 Time: 13:55
Sample: 1986 2016
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 84
Cross-sections included: 3

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-2.66586	0.0038

** Probabilities are computed assuming asympotic normality
Intermediate results on D(EX)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-Width	Obs
Nigeria	-0.91620	216.20	95.622	1	1	7.0	28
South Africa	-1.03641	51.614	5.8813	1	1	28.0	28
Kenya	-1.14086	36.202	2.6901	1	1	28.0	28
	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-1.05156	-6.523	1.001	-0.686	0.971		84

Appendix xxi: Panel Unit root for MC

Null Hypothesis: Unit root (common unit root process)
Series: D(MC)
Date: 01/21/18 Time: 13:57
Sample: 1986 2016
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 84
Cross-sections included: 3

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-2.07412	0.0190

** Probabilities are computed assuming asympotic normality
Intermediate results on D(MC)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-Width	Obs
Nigeria	-1.46033	2.E+20	1.E+20	1	1	4.0	28
South Africa	-1.60835	1.E+22	8.E+21	1	1	2.0	28
Kenya	-1.67630	7.E+18	3.E+18	1	1	5.0	28
	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-1.57797	-9.018	1.002	-0.686	0.971		84

Appendix xxii: Panel Unit root for M2

Null Hypothesis: Unit root (common unit root process)
Series: D(M2)
Date: 01/21/18 Time: 14:00
Sample: 1986 2016
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 84
Cross-sections included: 3

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-2.71345	0.0033

** Probabilities are computed assuming asympotic normality

Intermediate results on D(M2)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-Width	Obs
Nigeria	-0.71523	6.E+19	5.E+18	1	1	28.0	28
South Africa	-0.96782	2.E+18	2.E+17	1	1	28.0	28
Kenya	-0.77741	7.E+17	8.E+16	1	1	28.0	28
	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.87216	-5.489	1.003	-0.686	0.971		84

Appendix xxiii: Panel Unit root for TBC

Null Hypothesis: Unit root (common unit root process)
Series: D(TBC)
Date: 01/21/18 Time: 13:58
Sample: 1986 2016
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 84
Cross-sections included: 3

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-3.16191	0.0008

** Probabilities are computed assuming asympotic normality

Intermediate results on D(TBC)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
Nigeria	-1.23663	1.E+21	3.E+20	1	1	11.0	28
South Africa	-1.36409	3.E+21	2.E+20	1	1	28.0	28
Kenya	-1.22582	3.E+18	1.E+18	1	1	2.0	28
	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-1.27275	-7.681	1.001	-0.686	0.971		84

Appendix xxiv: Panel Pedroni Cointegration

Pedroni Residual Cointegration Test
Series: CPI EX M2 MC TBC
Date: 01/20/18 Time: 07:37
Sample: 1986 2016
Included observations: 93
Cross-sections included: 3
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
User-specified lag length: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	0.384124	0.3504	0.395524	0.3462
Panel rho-Statistic	1.048921	0.8529	0.777457	0.7816
Panel PP-Statistic	1.207341	0.8863	0.637959	0.7382
Panel ADF-Statistic	0.610645	0.7293	0.279117	0.6099

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.525579	0.9364
Group PP-Statistic	1.281038	0.8999
Group ADF-Statistic	0.793110	0.7861

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
Nigeria	0.781	27.97306	27.97306	0.00	30
South Africa	0.632	14.78123	13.67555	4.00	30
Kenya	0.341	14.50716	15.17522	1.00	30

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
Nigeria	0.637	26.10169	1	--	29
South Africa	0.560	14.68291	1	--	29
Kenya	0.248	14.70917	1	--	29

Appendix xxv: Panel Johansen Fisher Cointegration

Johansen Fisher Panel Cointegration Test

Series: CPI EX M2 MC TBC

Date: 01/20/18 Time: 07:49

Sample: 1986 2016

Included observations: 93

Trend assumption: Linear deterministic trend

Lags interval (in first differences): 1 1

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	43.88	0.0000	19.52	0.0034
At most 1	27.32	0.0001	19.80	0.0030
At most 2	12.15	0.0586	9.966	0.1261
At most 3	8.083	0.2321	5.865	0.4384
At most 4	9.956	0.1265	9.956	0.1265

* Probabilities are computed using asymptotic Chi-square distribution.

Individual cross section results

Cross Section	Trace Test Statistics	Prob.**	Max-Eign Test Statistics	Prob.**
Hypothesis of no cointegration				
Nigeria	91.1067	0.0004	34.3319	0.0441
South Africa	88.5398	0.0008	35.3377	0.0333
Kenya	88.1195	0.0009	34.7405	0.0394
Hypothesis of at most 1 cointegration relationship				
Nigeria	56.7749	0.0058	28.8950	0.0338
South Africa	53.2021	0.0145	28.9077	0.0337
Kenya	53.3790	0.0139	28.0153	0.0440
Hypothesis of at most 2 cointegration relationship				
Nigeria	27.8798	0.0819	16.1337	0.2171
South Africa	24.2944	0.1883	11.3991	0.6075

Kenya	25.3637	0.1488	21.0115	0.0520
Hypothesis of at most 3 cointegration relationship				
Nigeria	11.7462	0.1695	9.2594	0.2652
South Africa	12.8953	0.1187	9.5362	0.2442
Kenya	4.3522	0.8732	4.3357	0.8223
Hypothesis of at most 4 cointegration relationship				
Nigeria	2.4868	0.1148	2.4868	0.1148
South Africa	3.3591	0.0668	3.3591	0.0668
Kenya	0.0165	0.8977	0.0165	0.8977
**MacKinnon-Haug-Michelis (1999) p-values				

Appendix xxvi: Panel Fixed effect Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.447296	(2,53)	0.0963
Cross-section Chi-square	7.949886	2	0.0188
Period F	1.572972	(29,53)	0.0756
Period Chi-square	55.884909	29	0.0020
Cross-Section/Period F	1.608458	(31,53)	0.0631
Cross-Section/Period Chi-square	59.678839	31	0.0015

Cross-section fixed effects test equation:
Dependent Variable: MC
Method: Panel Least Squares
Date: 08/26/18 Time: 08:10
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	4.23E+08	2.78E+08	1.520796	0.1340
M2	-1.863818	0.458465	-4.065348	0.0002
CPI	-1.81E+09	9.65E+08	-1.879757	0.0654
TBC	0.676043	0.016195	41.74466	0.0000
ECM(-1)	0.360025	0.138527	2.598954	0.0120
C	8.23E+10	4.52E+10	1.820080	0.0742

Effects Specification
Period fixed (dummy variables)

R-squared	0.978018	Mean dependent var	1.57E+11
Adjusted R-squared	0.964430	S.D. dependent var	2.68E+11
S.E. of regression	5.05E+10	Akaike info criterion	52.41316
Sum squared resid	1.40E+23	Schwarz criterion	53.38530
Log likelihood	-2323.592	Hannan-Quinn criter.	52.80518
F-statistic	71.97281	Durbin-Watson stat	2.027115
Prob(F-statistic)	0.000000		

Period fixed effects test equation:
Dependent Variable: MC
Method: Panel Least Squares
Date: 08/26/18 Time: 08:10
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	2.55E+08	2.48E+08	1.026081	0.3079

M2	-1.394762	0.506348	-2.754550	0.0072
CPI	-33221633	2.97E+08	-0.111770	0.9113
TBC	0.746023	0.040713	18.32401	0.0000
ECM(-1)	0.514956	0.095683	5.381867	0.0000
C	-3.76E+10	1.96E+10	-1.916067	0.0588

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.962557	Mean dependent var	1.57E+11
Adjusted R-squared	0.959360	S.D. dependent var	2.68E+11
S.E. of regression	5.40E+10	Akaike info criterion	52.34577
Sum squared resid	2.39E+23	Schwarz criterion	52.56797
Log likelihood	-2347.560	Hannan-Quinn criter.	52.43537
F-statistic	301.1409	Durbin-Watson stat	2.035597
Prob(F-statistic)	0.000000		

Cross-section and period fixed effects test equation:
Dependent Variable: MC
Method: Panel Least Squares
Date: 08/26/18 Time: 08:10
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-70641014	1.79E+08	-0.395150	0.6937
M2	-1.196139	0.377464	-3.168885	0.0021
CPI	2.58E+08	2.14E+08	1.205177	0.2315
TBC	0.676826	0.017340	39.03352	0.0000
ECM(-1)	0.564180	0.092709	6.085523	0.0000
C	-1.17E+10	1.40E+10	-0.835650	0.4057

R-squared	0.960945	Mean dependent var	1.57E+11
Adjusted R-squared	0.958620	S.D. dependent var	2.68E+11
S.E. of regression	5.45E+10	Akaike info criterion	52.34348
Sum squared resid	2.49E+23	Schwarz criterion	52.51013
Log likelihood	-2349.456	Hannan-Quinn criter.	52.41068
F-statistic	413.3592	Durbin-Watson stat	2.071232
Prob(F-statistic)	0.000000		

Appendix xxvii: Panel Hausman Random Effects

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000
Period random	0.000000	5	1.0000
Cross-section and period random	0.000000	5	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.
* Period test variance is invalid. Hausman statistic set to zero.
** WARNING: estimated cross-section random effects variance is zero.
Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
EX	92776	-302811322.8	64691503.917	32086532623099876	0.0402
M2	-1.499186	-1.216551	0.112469	0.3994
CPI	30360689.17	-256990243.33	38595173814666016	0.1436

	9896			
TBC	0.749986	0.676044	0.001340	0.0434
ECM(-1)	0.497990	0.563069	0.000827	0.0237

Cross-section random effects test equation:
Dependent Variable: MC
Method: Panel EGLS (Period random effects)
Date: 08/26/18 Time: 08:15
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90
Wallace and Hussain estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.11E+10	2.02E+10	-2.036684	0.0449
EX	3.03E+08	2.50E+08	1.211701	0.2291
M2	-1.499186	0.496438	-3.019888	0.0034
CPI	-30360689	2.91E+08	-0.104267	0.9172
TBC	0.749986	0.040188	18.66195	0.0000
ECM(-1)	0.497990	0.096525	5.159168	0.0000

Effects Specification		
	S.D.	Rho
Cross-section fixed (dummy variables)		
Period random	1.81E+10	0.1120
Idiosyncratic random	5.09E+10	0.8880

Weighted Statistics			
R-squared	0.965099	Mean dependent var	1.57E+11
Adjusted R-squared	0.962120	S.D. dependent var	2.61E+11
S.E. of regression	5.09E+10	Sum squared resid	2.12E+23
F-statistic	323.9290	Durbin-Watson stat	2.046006
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.962513	Mean dependent var	1.57E+11
Sum squared resid	2.39E+23	Durbin-Watson stat	1.998810

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
	-596532804.0	-64691503.917	64602088317	
EX	86730	676	916152	0.0093
M2	-1.799060	-1.216551	0.115351	0.0863
CPI	-2227100504.662302	-256990243.33 1854	11295728591 98417800	0.0194
TBC	0.694721	0.676044	0.000450	0.3785
ECM(-1)	0.306767	0.563069	0.012048	0.0195

Period random effects test equation:
Dependent Variable: MC
Method: Panel EGLS (Cross-section random effects)
Date: 08/26/18 Time: 08:15
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90
Wallace and Hussain estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.58E+10	5.16E+10	1.662271	0.1021
EX	5.97E+08	3.08E+08	1.935728	0.0580
M2	-1.799060	0.499332	-3.602935	0.0007

CPI	-2.23E+09	1.08E+09	-2.053902	0.0448
TBC	0.694721	0.026915	25.81214	0.0000
ECM(-1)	0.306767	0.143312	2.140548	0.0368
	Effects Specification			
			S.D.	Rho
Cross-section random			1.65E+10	0.0985
Period fixed (dummy variables)				
Idiosyncratic random			4.98E+10	0.9015
	Weighted Statistics			
R-squared	0.962057	Mean dependent var		1.57E+11
Adjusted R-squared	0.938601	S.D. dependent var		2.01E+11
S.E. of regression	4.98E+10	Sum squared resid		1.36E+23
F-statistic	41.01576	Durbin-Watson stat		1.991834
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.977233	Mean dependent var		1.57E+11
Sum squared resid	1.45E+23	Durbin-Watson stat		1.870226

Cross-section and period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
	-998401955.9	-64691503.917	11159924567	
EX	18208	676	8025380	0.0015
M2	-2.258349	-1.216551	0.268330	0.0443
	-1928973299.	-256990243.33	14887811259	
CPI	267378	1854	71717200	0.0732
TBC	0.778816	0.676044	0.003129	0.0662
ECM(-1)	0.207151	0.563069	0.014572	0.0032

Cross-section and period random effects test equation:
Dependent Variable: MC
Method: Panel Least Squares
Date: 08/26/18 Time: 08:15
Sample (adjusted): 1987 2016
Periods included: 30
Cross-sections included: 3
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.83E+10	7.40E+10	0.246848	0.8060
EX	9.98E+08	3.77E+08	2.649803	0.0106
M2	-2.258349	0.634280	-3.560493	0.0008
CPI	-1.93E+09	1.24E+09	-1.556954	0.1254
TBC	0.778816	0.058342	13.34922	0.0000
ECM(-1)	0.207151	0.151863	1.364064	0.1783
	Effects Specification			
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.979877	Mean dependent var		1.57E+11
Adjusted R-squared	0.966208	S.D. dependent var		2.68E+11
S.E. of regression	4.92E+10	Akaike info criterion		52.36927
Sum squared resid	1.28E+23	Schwarz criterion		53.39697
Log likelihood	-2319.617	Hannan-Quinn criter.		52.78370
F-statistic	71.68770	Durbin-Watson stat		1.977565
Prob(F-statistic)	0.000000			