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RESEARCH ARTICLE

MONETARY POLICY OPERATION IN NIGERIA FROM 1980 TO 2016.

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Abstract

The study examines monetary policy operations and economic growth in Nigeria from 1980 to 2013. The purpose is to expose the impact of monetary policy operations on Nigeria's economic growth. The data for the study were sourced from CBN statistical bulletin. The econometric methods of OLS, Co-integration and Error Correction Mechanism (ECM) were employed as the analytical tools. The result of the parsimonious ECM shows that the overall model is satisfactory given the coefficient of determination of 53 percent and f-statistics of 2.150790. In addition, the variables of monetary policy (proxied by exchange rate, interest rate and money supply) are rightly signed. However, it was discovered that out of the explanatory variables, only interest rate was statistically significant at 5% level of significance in stimulating economic growth in Nigeria. Furthermore, the long run dynamic result also shows that there exists a long-run relationship or equilibrium among the variables. This is because the coefficient of ECM is rightly signed (that is negative) but statistically insignificant. Meaning that, the short run dynamics adjust to long run equilibrium relationship. Based on the findings, the study therefore suggests that monetary authority should review her exchange rate, interest rate and money supply policies so that the country's capability to produce the goods and services its people want will be increased. Moreover, government/monetary authorities should promote activities in all the sectors of the economy particularly the agricultural and industrial sector to enhance output and reduce the rate of dependence on foreign goods. There should be co-operation between the monetary and fiscal authorities to ensure smooth co-ordination and consistency in monetary and fiscal pursuits.

Introduction:-

Monetary policy is essential to achieve desired objectives which traditionally include full employment level, reduction in the level of inflation, maintenance of healthy balance of payment, sustenance of growth in the economy, etc. Importantly, monetary policy plays an important role in boosting the economic growth of any country.

According to Mordi (2008), the term monetary policy refers to the mix of concerted designed tools by the apex monetary agency to regulate the value, supply and cost of money consistent with the absorptive capacity of the economy or the expected level of economic activity without necessarily generating undue pressure on domestic

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prices and exchange rates. Also, monetary policy influences the level of money stock and interest rate in line with the level of economic activity. Its role in ensuring an overall macroeconomic stability cannot be overemphasised (George-Anokwuru, C.C. 2014).

However, according to Mishra and Pradhan, (2008) the smoothing of the business cycle, preventing financial crisis and stabilizing long term interest rates and the real exchange rate have been identified recently as other supplementary objectives of monetary policy because of the weaving global financial crisis which engulfed major developed and emerging economic in the world. The central bank is responsible for the conduct of monetary policy to pursue those objectives. Central banks in the world such as the Central Bank of Nigeria (CBN), often employ certain monetary policy instruments like bank rate, open market operation changing reserve requirements and other selective credit control instruments. Central bank also determines certain targets on monetary variables.

Moreover, at independence in 1960, Nigeria had great potential of being a prosperous nation given its abundant human and natural resources. The outlook was further brightened by the oil boom in the 1970s. Consequently, government had to implement series of ambitious Development Plans aimed at ensuring rapid economic growth and development. Initially, at least up to the early 1970s, the overall economic performance was impressive: The rate of growth of GDP for instance averaged about 8.8 percent between 1970 and 1974 (Inam, 2005). The massive inflow of foreign exchange earnings mainly from improved petroleum prices as well as high rate of domestic and foreign investments in industry, construction and services helped to sustain the GDP growth rate at reasonably high levels (Inam, 2005). With the huge earnings from crude Oil exports, government became the prime mover of the economy through direct participation in basic production of goods and services as well as in the provision of infrastructure. However, the fortune was not sufficiently capitalized upon to ensure an enduring economic performance. Thus, the Nigerian economy began to show signs of distress in the early 1980s. Since then the performance of the economy has been quite epileptic (Inam, 2005).

Over the years, government of Nigeriahave adopted the use of direct monetary instrument such as credit ceilings, selective credit controls, administered interest, prescription of cash reserve requirements and special deposit in order to maintain the desired macroeconomic objectives. Nevertheless, with advent of Structural Adjustment Policy (SAP) of 1986, the implementation of monetary policies was aimed at inducing the emergence of market-oriented financial system for effective mobilization of financial savings and efficient resource allocation. The main instrument of market-based framework is the open market operations. This process was complemented by the several regime changes in reserve requirements and discount window operations. Also, the October 1996, position of monetary policy objective was directed at abolishment of mandatory credit allocation. The commercial and merchant banks were subjected to equal treatment since their operations were found to produce similar effects on the monetary policy process. In 2005 the minimum paid up capital was further raised to n 25 billion naira for all commercial banks in accordance with the recapitalization exercise. In 2006, the Central Bank of Nigeria (CBN) introduced a new monetary policy implementation framework policy rates (MPR) to replace the Minimum Rediscounted Rate (MRR). Specifically, this was done to dampen the volatility of interest rates in money markets and stimulate a transaction rate that would improve the transmission of monetary policy actions and ultimately to achieve a stable value of the domestic currency. An important implication of the various policies initiated above was to bring about stability in the macroeconomic policies. The conduct of monetary policy was largely influenced by the global financial crisis which started in 2007 in United States of America (USA) and spread to other regions and emerging markets including Nigeria. Consequently, in the wake of the global financial crisis, the bank largely adopted the policy of monetary easing to address the problem of liquidity shortages in the banking system from 2008 to September 2010.

Hence, it is very important to examine empirically the impact of monetary policy on economic growth in Nigeria.

Statement of the Problem

In spite of the concerted global coordination in the operations of monetary policies, the global economic performance has remained disturbing. The global economic crisis has led to the global reduction in credit activity, caused fall of domestic product as well as the level of foreign direct investment. In Nigeria its economy has never been insulated from global structural changes, the economy has been faced with complex macroeconomic challenges such as high domestic inflation, unstable financial system and high jobless growth rate. In spite of many, and frequently changing monetary and other macro-economic policies, Nigeria has not been able to harness her huge economic potentials for rapid economic growth and development. The drop in foreign direct investment, fall in price

of crude oil at the international market and low investment in the country has made the economy more susceptible to international fluctuations. The debate on the effectiveness of monetary policy operations as a tool for promoting growth and development remains inconclusive, given the conflicting results of current studies. Over the last decade, the growth impact of monetary policy has generated large volume of both theoretical and empirical literature. To put it differently, economists have developed lots of empirical studies on the effectiveness of monetary policy in achieving economic growth.

However, owing to the existing lack of consensus among economists on the operational validity of monetary policy on the economic growth and its ability to stimulates considerable macroeconomic stability in the short-run. This study investigates the effectiveness of monetary policy in stimulating the growth of the Nigerian economy.

Objectives of the Study

The main objective of this study is to examine the impact of monetary policy operationson Nigeria's economic growth from 1980-2013. The specific objectives of the study are to;

1. examine the relationship between money supply and economic growth in Nigeria;
2. examine the relationship between exchange rate and economic growth in Nigeria;
3. ascertain the relationship between interest rate and economic growth in Nigeria.

Literature Review

The impact of monetary policy on economic growth has generated large volume of empirical studies with mixed findings using cross sectional, time series and panel data. Some of these studies are country- specific while others are cross-country. Few of the studies are selected for review as follows:

Exchange Rate and Economic Growth

Eze and Okpala (2014) conducted a study on the quantitative analysis of the impact of exchange rate policies on Nigeria's economic growth. The study employed Chow test to determine the structural stability of the relationship between exchange rate and output of goods and services during the two regimes and Augmented Dickey-Fuller unit root tests and Johansson co-integrating tests was also conducted in study to test the stationary of the variables and the order of integration. They found out that exchange rate and money supply had a significant impact on Nigeria's economic growth performance. This in other words means that exchange rate and money supply are a major determinant of output growthrate in Nigeria. Chow test showed that the relationship between exchange rate and economic growth performance in Nigeria have not undergone any significant structural changes.

Osiegbu and Onuorah (2012) posit that exchange rate plays a key role in international economic transactions because no nation can remain in isolation due to varying factor endowment. Movements in the exchange rate have ripple effects on other economic variables such as interest rate, inflation rate, import, export, output, etc. These facts underscore the importance of exchange rate to the economic well-being of every country that opens its doors to international trade in goods and services.

Emeh and Johnson (2010) examined the possible direct and indirect relationshipsbetween exchange rate and GDP growth. The study adopted a simultaneous equation model and a generalized method of moment (GMM) technique for the empirical analysis. The empirical results revealed that there is no strong direct relationship between changesin exchange rate and output growth. This in other words means that changes in exchange rate had no significant increase in output growth rate in Nigeria.

Rodric (2006) investigated the relationship between exchange rates and economic growth in Kenya. Thestudy revealed that exchange rates have no significant relationship on economic growth. They are however indirectly linked through several channels, including money, imports, agricultural production and foreign aid. Based on the literature review, we expect a mixed relationship between exchange rate and economic growth.

Interest Rate and Economic Growth

Corazon (2014) in examining the effect of monetary policy and economic growth in Kenya advocated that specific reduced interest rates are essential to spur economic growth and attain low inflation levels. This conclusion was reached from the VAR study which showed that monetary policy has a negative and insignificant effect on output in the first two months, which then becomes positive and insignificant in the next four months. For inter-bank rate, he

observed an impact on inflation, and this impact is positive and significant for the first two and a half months. The process continuous to be positive but insignificant up-to the sixth month.

Nicholas (2010) examined the dynamic relationship between interest rate reforms; bank based financial development and economic growth in South Africa using co-integration and Error correction models. The empirical findings revealed that interest rate reforms have a strong positive impact on financial development. The study also showed that interest rate reforms do not Granger cause investment and economic growth. In addition, interest rate policy is among the emerging issues in current economic policy in Nigeria in view of the role it is expected to play in the deregulated economy in inducing savings which can be channeled to investment and thereby increasing employment, output and efficient financial resource utilization (Rodric, (2006)).

Obamuyi (2009) investigated the relationship between interest rate and economic growth in Nigeria using time series data covering 1970-2006. The study applied co-integration and error correction model to capture both the long run and short run dynamics of variables in the model. The result showed that real lending rates have significant effect on economic growth. Based onthe literature review, we expect a positive relationship between interest rate and economic growth.

Money Supply and Economic growth

Uduakobong (2014) examinesthe role of money supply on economic growth in Nigeria between1985-2012. Using augmented Cobb-Douglas production function andrelying on co-integration/Error- CorrectionMethodology, it is found that money supply does notonly have a positive impact on economic growth in Nigeria, but such impact is strongly and statistically significant. Thus, greater emphasis should be onthe improvement of the monetary policies, instruments and institutions in Nigeria if their contribution to Nigeria's economic growth is to be maximized.

Ahmed, Asad, and Hussain (2013) examined the fundamental relationship between money supply, prices and income in Pakistan. The study employed a time series data of real gross domestic product (GDP), nominal GDP, prices and money supply for the period of 1973 to 2007. The stationary properties of the data series were investigated with the help of ADF test and series were found integrated of the order zero. They found out that a significant relationship exists between the growth of money supply and inflation.

Onayemi (2013) examines Price Stability effect of Monetary Policy and Output Growth in Nigeria between 1970and 2011 using time series analysis. The study employed OLS and Co-integration/Error correction methods of econometrics. The estimated results revealed that the first lag of price gap, current money supply gap, first lag of money supply gap, current real output gap and first lag ofreal output gap exert positive influence on current price gap in Nigeria between the inception of a decade after independence and 2011 fiscal year and it was only the effect of real output gap that does not conform with the theoretical expectation. While, second lag of price gap exerts negative effects on inflationary pressure in Nigeria during the review periods and this does not conform with the apriori expectations based on sign. Also, the Johansen cointegration test result indicated evidence of long-run relationship. The study recommends that the monetary authority should endeavour to strengthen the effectiveness of the major instruments of controlling money supply in order to decelerate its effect in influencing inflation pressure in Nigeria.

Charles (2012) in monetary policy and economic growth in Nigeria applied OLS between 1981 and 2008, concludes that money supply brings about significant impact on GDP growth and Balance of Payment. He also found that an inverse relationship existed between money supply and rate of inflation, thus monetary policy must be implemented to facilitate favourable investment climate through appropriate interest rate, exchange rate and liquidity management mechanism.

Onyeiwu (2012) examines the impact of monetary policy on the Nigerian economy by employing an Ordinary Least Squares Method (OLS) to analyses the secondary data collected between 1981 and 2008. The empirical finding revealed that monetary policy measured by money supply has a significant positive impact on GDP growth rate of output.

Waliullah&Fazli (2011) in their study entitled Effectiveness of Monetary Policy in Pakistan. The focus of the study is to ascertain the long run relationship existing between money, price level and GDP from 1972: 1 to 2005: IV.

Employed ECM, found out that a stable long run exists between M1, GDP and CPI in Pakistan. Thus they suggested that a radical approach changes in monetary policy affects movements of the macro economy in Pakistan.

Manoucher, N. & Ahmad, J. S. (2011) in their study, The Impact of Monetary Policy on Economic Growth in Iran, adopted Levine and Renelt growth model they found between 1974 to 2008 using OLS that there is a positive and direct influence relationship between money supply and economic growth in Iran.

Ogunmuyiwa and Ekone (2010) investigated the significant impact of money supply on economic growth in Nigeria between 1980 to 2006. The study employed ordinary least square equation, causality, and error correction model for the empirical analyses. They found out that money supply has positive and a significant impact on economic growth but the result is however insignificant in the case of GDP growth rates on the choice between cointractionary and expansionary money supply. This in conclusion means that the increase in money supply will lead to a significant increase in economic growth.

Ali, Irum& Ali (2008) by studying the impact of monetary policy components on economic growth in Asian Countries between 1990 and 2007 applied an autoregressive Distributed lag (ARDL) model. The findings suggest that money supply has significant and positive impact on economic growth in both the short-run as well as in long-run. In other words the potency of money supply to stimulating economic growth in Asian economies is positive.
Anoruo (2002) ascertaining the constancy of the M2 in Nigeria using Johasen and Juseliuscointegration method. There was existence of a long run impact existing between M2, real discount rate and economic activity.
Nwaobi (1999) following the earlier work of Ajayi (1974) and Asogu (1998) examined the interaction between money and output between 1960 and 1995. His findings indicated that unanticipated growth in money supply has positive effect on output.

Elliot (1975) examines relative importance of money supply changes and government expenditure changes to underscore volatility in nominal GDP. By using St. Louis equation with the use of OLS techniques such as:
$\Delta Y_t = c + \sum m_i \Delta M_{t-j} + \sum C_j \Delta E_{t-1} + \mu_t$, where ΔY_t represents the changes in nominal GDP, ΔE represents the changes in the high employment of federal government expenditure. His empirical evidence puts forward a conclusion that volatility in nominal GDP are clearly a monetary affair and movements and that government expenditures are but passive in determining changes in macro changes in nominal GDP.

Monetary Policy and the Growth of the Nigerian Economy
Monetary policy is the Central Bank's use of money supply and interest rates to regulate the economy. Ohale (2001) defines monetary policy as the measures taken by the government to influence money supply and interest rate (credit) in the economy with a view to influencing the overall level of economic aggregate like output, employment and price level. Monetary policy can also be described as the act of controlling the direction and movement of monetary policy and credit facilities in pursuance of stable price and economic growth in an economy, CBN (1992). Monetary policy is the deliberate use of monetary instruments (direct and indirect) at the disposal of monetary authorities such as central bank in order to achieve macroeconomic stability.

Moreover, monetary policy is an economic policy which refers to the combination of measures designed to control supply of money and credit conditions in an economy for the purposes of achieving macro-economic goals of full employment, economic growth, stability of price and wealth, efficient resources allocation, favourable balance of payments and increase in industrialization (Ogunmuyiwa and Ekone2010).

Monetary policy is a programme of action undertaken by the monetary authorities generally the Central Bank, to control and regulate the supply of money with the public and the flow of credit with a view to achieving predetermined macroeconomic goals (Dwivedi, 2005).

However, monetary policy got its root from the works of Irving Fishers (Diamond, 2003) who laid the foundation of the quantity theory of money through his equation of exchange. In his proposition money has no effect on economic aggregates but price.

In addition, the role of money in an economy got further elucidation from Keynes (1930) and other Cambridge economists who proposed that money has indirect effect on other economic variables by influencing the interest rate which affects investment and cash holding of economist agents. The position of Keynes is that unemployment arises

from inadequate aggregate demand which can be increased by increase in money supply which generates increase spending, increase employment and economic growth. However, he recommends a proper blend of monetary and fiscal policies. The role of monetary policy in influencing the volume, cost and direction of money supply was conversed by Friedman (1968), whose position is that inflation, is always and everywhere a monetary phenomenon while recognising in the short run that increase in money supply can reduce unemployment but can also cause inflation and so monetary authorities should increase money supply with caution.

In contemporary economies, the central bank is the authority with the mandate of manipulating monetary policy, through monetary policy tools, to achieving desired macroeconomic objectives which includes; achievement of economic growth, price stability with respect to both domestic and external prices. In the same vein uses inflation rate to track movement in the domestic price while exchange rate policy are used as tool in ensuring external stability thereby enhancing export performance in the economy according to Neaime (2008).

Nevertheless, exchange rate policy impacts on the outcome of stabilization measures and debt management strategies according to Busari and Olayiwola (1999) repectively in developing countries which includes Nigeria. The CBN uses monetary policy in order to maintain price stability. Hence, price stability occurs when goods and services in general, are not getting rapidly more expensive (that is inflation) or less expensive (that is deflation). At present, price stability is defined as keeping inflation on average over the medium term. Inflation on the other hand, depicts an economic situation where there is a general rise in the prices of goods and services continuously. It could also be defined as a continuing rise in the prices as measured by an index such as the Consumer Price Index (CPI) or by the implicit price deflator to Gross National Product (GNP). When there is inflation, the currency loses purchasing power. The purchasing power of a given amount of naira will be smaller over time when there is inflation in the economy. Emeka (2005) opined that the pursuit of price stability invariably implies the direct pursuit of other objectives such as economic growth, which can only take place under condition of price stability and allocative efficiency of the financial markets, since inflation is generally considered as purely a monetary phenomenon, with significant cost to the economy. The primary goal of monetary policy to him is to ensure that money supply is at a level that is consistent with the growth rate will ensured.

Chritopher, Monso , HuaHwa, Jun (2006) reported that investors generally believe that monetary policy and macroeconomic events have a large influence on the unpredictability of the stock price, which further implies that macroeconomic variables could exert shocks on share return and thereafter influence investment decision. Akinnifesi (1987) found out that there is a relationship between exchange rate and stock prices fluctuation. He found out that the impact of naira depreciating as a monetary policy tool goes a long way in increasing stock prices. Masha Iyabode (1999) opines that, in the latter 1980s as a result of structural adjustment program, the effects of wage increases created a cost-push effect on inflation which in the long run, was a structural feature of the economy coupled with the growth in money supply.

Economic growth has long been considered an important goal of economic policy with a substantialbody of research dedicated to explaining how this goal can be achieved (Fadare, 2010).Economic growth has received much attention among scholars. Accordingto Khorravi and Karimi (2010), classical studies estimate thateconomic growth islargely linked to labour and capital as factors of production. The emergence of theendogenous growth theory has encouraged specialists to question the role of otherfactors in explaining the economic growth phenomenon (Bogdanov, 2010).
Economic growth is defined and measured as either: an increase in real gross domestic product (GDP) accruing over some time period, or an increase in real GDP per capita occurring over some time period (McConnell and Brue, 2005). With either definition, economic growth is calculated as a percentage rate of growth per quarter (3- Month period) or per year. The second definition takes into consideration the size of the population.

Real GDP per capita (or per capita output) is found by dividing real GDP by the size of the population (McConnell and Brue, 2005).

Specifically, economic growth means the expansion of a country's capability to produce goods and services its people want within a given period. According to Meyer (2010) economic growth is defined as a substantial increase in a country's real Gross Domestic Product (GDP) per person over time. Economic growth can broadly be viewed as an increase in standard of living, health and material abundance.

A fundamental definition of economic growth is usually in terms of the country's potential for the production of goods and services. This appears to be a sufficient definition. Nevertheless, productive capacity is usually important in the concept of economic growth. Economic growth, however, depends not only on changes in the economy's potential for production but also the extent to which that capacity is utilized. Therefore, economic growth involves an increase over time in the actual output of goods and services as well as an increase in the economy's capability to produce goods and services. Hence, Economic growth represents the expansion of a country's potential GDP or output.For instance, if the social rate of return on investment exceeds the private return, thentax policies that encourage can raise the growth rate and levels of utility. Growthmodels that incorporate public services, the optimal tax policy lingers on thecharacteristic of services (Olopadeand Olopade, 2010).Economic growth has provided insight into why state growth at different rates overtime; and this influence government inher choice of tax rates and expenditure levelsthat will influence the growth rates.

There are several benefits derived from economic growth. A major advantage of economic growth is that it brings about advances in foods production, health, and material advance. This would not have been possible without economic growth. The quantity and quality of material goods have increased significantly in most countries over the years. As the economy grow and diversifies, more people are able to escape subsistence farming. As a result they pursue other areas of interest.

All over the world, the major preoccupation of Central Banks is the formulation and implementation of monetary policy. This is predicated on the use of monetary policy as a tool for enhancing the macroeconomic environment generally and in particular an efficient financial system/market, in order to promote economic growth. Central Banks in developing economies are further entrusted with other developmental functions with a view to engendering rapid economic development. In pursuance of these objectives, central banks are usually given the core mandate of maintaining internal and external value of the currency, which in the domestic economy, translates to keeping inflation low and stable. They also undertake an evaluation of the economy, which forms the basis for monetary policy formulation and implementation. To the extent that monetary policy is a tool for macroeconomic management, its application varies from country to country and produces different results Mordi (2009). He stated that sometimes, the outcomes of monetary policy intended and dissatisfactory.

Lipsey and Crystal (1995) stated that a good monetary policy in itself cannot make an economy rich, but a bad monetary policy does disrupt the real economy thereby cause a loss of real output.According to Mordi (2009) monetary policy are a blend of measures and or set of instruments designed by the central bank to regulate the supply, value and cost of money consistent with the absorptive capacity of the economy or the expected level of economic activity without necessarily generating undue pressure on domestic prices and the exchange rate.

In similar words, Folawewo and Osinubi (2006) have stated that in general terms, monetary policy refers to a combination of measures designed to regulate the value, supply and cost of money in an economy, in consonance with the expected level of economic activity. Momentously, Money Supply refers to the total stock of monetary media of exchange available to a society for use inconnection with the economic activity of the country (Ahuja, 2010). According to the standard concept of money supply, it is composed of the following two elements: Currency with the Public and Demand deposits with the Public. Two things must be noted with regard to the money supply in the economy. First, the money supply refers to the total sum of money available to the public in the economy at a point of time. That is, money supply is a stock concept in sharp contrast to the national income which is a flow representing the value of goods and services produced per unit of time, usually taken as a year secondly, money supply always refers to the amount of money held by the public (Ahuja, 2010).

That the objectives of monetary policy include price stability, maintenance of balance of payments equilibrium, promotion of employment and output growth, and sustainable development. From the forgoing, it could be deduced that monetary policy plays important role in the economy by influencing the cost and availability of credit to control inflation and maintaining equilibrium in the balance of payments, ensure full employment, promote sound financial system and exchange rate stability, and sustainable growth and development, amongst others. To attain such goals, monetary policy instruments which are of two types- quantitative and qualitative are normally used. But the quantitative variant is necessarily mentioned here, Jhingan (2008).

Chinwuba, Akhor and Akwaden (2015) examine the impact of monetary policy innovations on growth rate of output in Nigeria. The study utilized times series data within the period of 1985 to 2012 which was sourced from the

statistical bulletin of Central Bank of Nigeria, Nigerian Investment Promotion Commission (NIPC) and Securities and Exchange Commission (SEC). The study employed Vector Autoregressive (VAR) estimation technique in the analysis of data. The result showed that money supply exerts significant influence on growth of output in Nigeria while exchange rate and interest rate were insignificant.

Udude (2014) examines the impact of monetary policy on the growth of Nigeria economy between the period of 1981 and 2012 with the objective of finding out the impact of various monetary policy instruments (money supply, interest rate, exchange rate and liquidity ratio) in enhancing economic growth of the country within the period considered. To identify the stationarity characteristics of the data employed in the empirical investigation, various advanced econometric techniques like Augmented Dickey Fuller Unit Root Test, Johansen Cointegration Test and Vector Error Correction Mechanism (VECM) were employed and the following information surfaced: None of the variables was stationary at level meaning they all have unit roots. But all the variables became stationary after first difference with the exclusion of money supply. However, all the variables became stationary after second difference. Hence they were integrated of order two. The cointegration result indicated that there is long run relationship among the variable with two cointegrating vectors. The result of the vector error correction mechanism (VECM) test indicates that only exchange rate exerted significant impact on economic growth in Nigeria while other variables did not. Equally, only money supply though statistically insignificant possessed the expected sign while others contradicted expectation.

Ismail, Adegbemi& Mariam (2013) in Does monetary policy influence economic growth in Nigeria? Using ECM between 1975 and 2010; finds two basic properties of monetary policy instruments on the economy have long run relationship and these relationships are significant. These instruments such as inflation rate, exchange rate and external reserve possesses effect on the economy. Hence they recommend the establishment of primary and secondary government bond market that will facilitate efficiency of monetary policy and also cut government dependence on central bank for direct financing.

Adeleke, Sikiru&Akinola (2013) in assessing impact of monetary policy and Nigeria's economic growth with data from 1970-2005 adopted cointegration and error correction model. They used GDP, bank rate, bank credit, monetary policy rate and exchange rate as their independent and dependent variables, identified that only exchange rate has significant impact on growth. The study establishes further that a long run relationship between GDP and monetary policy variables exist based on available data. They advocate much attention be given to monetary instruments as used in the paper to bring about stability on the economy.

Adesoye (2012) examined the co-integration and causality between price, monetary aggregate and real output in Nigeria within the period of 1970 to 2009 using the inflationary gap model based on the quantity theory of money. The unit root test showed that money and price gaps are stationary at level, while real output is found stationary at first difference. The Johansen co-integration test revealed presence of one co-integrating vector and causality is found to significantly run from money supply to price. The impulse response function analysis indicated that price is more responsive to one squared variance of its own shocks, monetary and output shocks as the horizon prolonged.
Hameed, Khaid and Sabit (2012) examine the Linkage between MonetaryInstruments and Economic Growth. They reviewed how the decisions of monetary authorities influence the macro variables like GDP, money supply, interest rates, exchange rates and inflation. The method of ordinary least square OLS was used to explain the relationship between the variables under study. However, tight monetary policy in term of increase in interest rates has significant negativeimpact on output. However, exchange rate also has a negative impact on output.

Bilquees, Mukhtar, and Sohail (2012) investigate the dynamic interactions among macroeconomic variables in Pakistan for the period 1972Q1 to 2009Q4. The study employed a Johansen multivariate cointegration technique, Granger causality test and variance decomposition. The empirical results revealed that existence of co-integration, the causality test supports the non-neutrality of money view of the Keynesians and the monetarists at least in the short-run. The findings also showed that a bi-directional causality between money supply and price level, and interest rate and price level.

Saibu and Nwosu (2011) examine the effect of monetary policy on sectoral output growth in Nigeria within a period 1986 to 2008. They employed Auto Regressive Distributed Lag (ARDL) model in the data analysis. They observed that that manufacturing sector is not sensitive to anyof the monetary policy variables. This implies that interest rate and exchange rate does not really influence output growth among manufacturing sector of the economy. Meanwhile,

in agricultural sector, exchange rate influences output growth in Nigeria. Inaddition, interest rate and exchange rate are the main determinants of mining output growth while building/construction sector is more responsive to changes in exchange rate and bank credit.

Udah (2011) in his impact of stabilization policies (fiscal and monetary policies) and electricity supply on economic development in Nigeria applied OLS technique in the study. By using Perron (2011) modifies unit root test to ascertain the characteristic of variables and the ARDL bounds testing approach to cointegration proposed by Pesaran, Shin and Smith (2001). The study showed that broad money supply and interest rate were veritable instruments and determinants of per capita GDP growth rate in Nigeria. The finding however posits that demand management is useful for the purpose for economic stabilization in Nigeria.

Adefaso&Mobolaji (2010) empirically examine the relative effectiveness of fiscal and monetary policy on economic growth in Nigeria. Annual time series data from 1970-2007 was employed. ECM and cointegration techniques have been used in the study. Using variables such as; Gross Domestic Product, Broad money, Government expenditure and degree of openness. The result shows that the efforts of monetary policy on economic growth in Nigeria is much stronger than fiscal policy. Hence, policy makers should emphasise on monetary policy for the purpose of economic stabilization in Nigeria.

Jawaid, Arif and Nacemakeh (2010) investigate the comparative effect of fiscal and monetary policy on economic growth in Pakistan using annual time series data from 1981 to 2009. Cointegration test confirms positive long run relationship between monetary and fiscal policy on economic growth. However, monetary policy is found to be more effective than fiscal policy in enhancing the economic growth of Pakistan. They suggested that policy makers should focus more on monetary policy than fiscal policy to ensure economic growth. However, the short-run relationship should also have been checked.

Omoke and Ugwuanyi (2010) investigated the long-run relationship between money, price and output in Nigeria. Their empirical finding suggests that no con-integrating vector exist between the variables and also found that money supply granger causes both output and inflation suggesting that monetary stability can contribute towards price stability.

Chimobi and Uche (2010) examined the relationship between Money, Inflation and Output in Nigeria. The co-integrating result revealed that the variables used in the model exhibited no long run relationship among each other. The result of the study suggested that monetary stability can contribute towards price stability in the Nigerian economy since the variation in price level is mainly caused by money supply and concluded that inflation in Nigeria is to an extent a monetary phenomenon.

Chuku (2009) in his study measuring the effects of monetary policy innovations in Nigeria: A structural vector Autoregressive traced the effect of monetary policy shocks on output and prices in Nigeria, found that while M2 had modest effects on output and prices, MRR and REER (minimum rediscount rate and real effective exchange rate) have neutral and fleeting effects on output. Therefore he concludes that an effective manipulation of M2 (broad) money supply to influence output and price in the economy is indispensable. Used data set between 1986:1 and 2008:4.

Mohammed, Wasti, Lal&Hussain (2009) examines the long run relationship among M2, inflation, government expenditure and economic growth in Pakistan by using annual time series data from 1977 to 2007. Cointegration result show that public expenditure and inflation has significant and negative effect while M2 has significant and positive effects on economic growth in the long-run.

Abdul-Majid, (2007) examined the relationship between money, inflation and real output in Indonesia, Pakistan and Malaysia. They employed vector autoregressive (VAR), Johansen co-integration method and Granger-Causality test for the empirical analysis. They also employed the impulse response function to determine the response of price gap on Cholesky one standard innovation of inflation, money and real output shocks in Nigeria. Their study revealed that money supply is a lead indicator of inflationary pressure.

Balogun (2007) employed simultaneous equation models to the relationship between monetary policy ineffectiveness and economic growth. He finds that ineffectiveness monetary policy ineffectiveness in Nigeria

brings about a decline in economic growth. He also found similar evidence in Gambia, Guinea, Ghana and Sierra Leone using the same models.

Javed&Sahinoz (2005) examined the relationship between economic growth and government spending in Turkish economy with and without using money supply as an explanatory variable. The study employed a quarterly data set for the period 1992:1 to 2003:3 of GNP growth, government spending and money supply. The study checked the long run relationship among these variables by using Engle granger, Philips-Ouliaris and Johansen's cointegration test while granger test is used to check the causality. Engle granger and Philips-Ouliaris found no long-run relationship between economic growth and government spending. However, the evidence of long-run relationship was found after the inclusion of money supply in the equation. The study found bi-directional causality between economic growth and money supply after excluding government spending while uni-directional causality between government spending and money supply after excluding economic growth.

Ajisafe&Folorunso (2002) determined the relative effectiveness of monetary policy on economic activity in Nigeria through co-integration and error correction mechanism modelling techniques. The time series properties of the variables were investigated by conducting a unit root using annual series of data for the period 1970-1998 and data source was mainly CBN statistical bulletin. The result of the analysis shows that monetary policy exerts a great impact on economic activity in Nigeria.

Nwaobi (2002) using a cointegrated technique with time series data from 1960-95, discovered that money supply, real GDP, inflation and interest rate has long-run relationship in Nigeria context.

Rogers and Wang (1995) conducted a study on output, government spending, inflation, the real exchange rate,and money growth in Mexico using VAR model for the data analysis. They found out that exchange rate depreciations will lead to a decrease in output.

Ajayi (1974) in his study holds that in developing economy a case of Nigeria, fiscal policy is situated in the policy circle environment more than the monetary policy. By studying and applying OLS techniques in analyzing monetary and fiscal policy observed that monetary influences are much effectual, larger and more predictable than fiscal component. Furthermore, the study reveals that monetary actions were effective than that of fiscal action. In essence, monetary action instead of fiscal action should be given utmost consideration when manipulating variables for economic activity.

Model Specification

This section specifies the model that was used in this study. The model was cast in line with Hameed, Khaid and Sabit (2012), whose model is in the form GDP = f (MS, IR, EXR INF) but with slight modification. However, this current work excluded inflation (INF) from the model. Thus, both linear and log-linear specifications of the model were tried as follows:

The Linear Specification;

GDP = F (MS, EXR, INR)

$GDP_t = a_o + a_1MS_t + a_2EXR_t + a_3INR_t + U_t$……...(3.1)

The study also tried the non-linear specification. In this respect, the multiplication version or the Cobb Douglas variety was adopted. In multiplication form we have

$$GDP_t = MS_t^{\alpha_1} EXR_t^{\alpha 2} INR_t^{\alpha 3} e^u \quad (3.2)$$

Taking natural log to have a log-linear form

$LnGDP_t = Lna_o + a_1LnMS_t + a_2LnEXR_t + a_3LnINR_t + U$……(3.3)

(Note ULn e= U since In e=1)

Where;

Ln= natural logarithm

GDP = Gross Domestic Products

MS= Money Supply

EXR = Exchange Rate

INR = Interest Rate
U = Error Term
a_0 = The constant parameter
a_1, $a_2$and a_3>0 = The slope parameters

Apriori expectation
On the apriori: $a_1 > 0$, $a_2 > 0$ and $a_3 < 0$

1. a_1 is expected to have a positive sign. This is because an increase in money supply will bring about an increase in the total money in circulation in the country. This will increase aggregate demand and lead to a rise in productive activities and investment opportunities in the economy. ($a_1 > 0$).
2. a_2, is expected to have a positive sign because when foreign exchange rates increase, worth of the local currency is expected to decrease, this will bring about inflation and eventually reduces RGDP and vice versa. ($a_2 > 0$).
3. a_3 is expected to have a negative sign. This is because an increase in the rate of interest will discourage investors from borrowing funds from the financial sector, thus, reducing the level of investment and productive activities in the economy. ($a_3 < 0$).

The Variables Included in the Model
The variables included in the model are classified as dependent and independent variables.

Dependent Variable
Gross Domestic Product (GDP):
This means the total monetary value of all finished goods and services produced within a country's boarder in a specified fiscal year. GDP is expected to be positively influenced by money supply and exchange rate but negatively influenced by interest rate.

independent Variables
Money Supply (MS):
the money supply or money stock is the total amount of monetary assets available in an economy at a specific time. In this study, money supply is independent variable and the coefficient of (MS) is expected to be positive; i.e. $a_1 > 0$. This is because, an increase in money supply will bring about an increase in the total money in circulation in the country. This will increase aggregate demand and lead to a rise in productive activities and investment opportunities in the economy. This rise in the productive activities in the economy will lead to a rise in the export of goods and services, thus, leading to a rise in the balance of payments position of the country.

Foreign Exchange Rate (EXR):
Exchange rate is the price of one currency in terms of another. It can be expressed in one or two ways: as units of domestic currency per unit of foreign currency; or units of foreign currency per unit of domestic currency.It is usually determined by the demand for and supply of foreign exchange. In this study therefore, it is used as an independent variable. Since naira is not used everywhere and transactions are made with different countries, there is the need to include foreign exchange rate as one of the variables in the model.

Interest Rate (INR):
This is the cost of borrowing investible fund. In this study, interest rate is independent variable and the coefficient of (INR) is expected to be negative; $a_3 < 0$. (This is because the monetary theory of balance of payments holds a negative relationship; $a_3 < 0$). Furthermore, an increase in the rate of interest will discourage investors from borrowing funds from the financial sector, thus, reducing the level of investment and productive activities in the economy. Such reduction in the productive activities of the country will lead to fall in the balance of payments position in the country.

Data Required
This study employed secondary data relating to the dependent and independent variables. This is necessitated by the nature of this research work. In fact, the following time series data were used in the study.

Gross Domestic Product	1980-2013
Foreign Exchange rate	1980-2013
Interest rate	1980-2013
Money Supply	1980-2013

Data Collection and Sources

Since the research is analytical in nature, the type of data that was required for this study is secondary data. Moreover, the data to be collected and utilized in this work were sourced from Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics, Journals, Textbooks, Magazines, library research, among others. It covers the period 1980-2013. Moreover, it is taken that the data are a true representative of the Nigerian economy, trusting that the analysts and researchers of the CBN and NBS (National Bureau of Statistics) are efficient to the content that human error allows. Thus, the data remain secondary in nature and transformation of data will be carryout where necessary.

Method of Data Analysis

The empirical analysis employed the Ordinary Least Square (OLS) technique of econometrics. The OLS technique was used for estimating the equation models that were specified under the model specification. This method is popularly used because of its simplicity and strong theoretical properties such as linearity, unbiased and minimum variance among a class of unbiased estimator (Gujarati, 2007).

Moreover, the Error Correction Method of Co-Integration based on Engle- Granger (1987) co-integration theorem was also used. The choice of these econometric approaches is premised on the fact that time series data are sometimes pronged to fluctuation that may cumulate into spurious regression result. It is important to note that time series data are prone to error due to fluctuations in business activities from which most of our data are derived. Hence, the choice of these econometric techniques helped us not only to determine how the variables that were considered in this study have influenced the real GDP in Nigeria. They also helped us to correct pitfalls that would have influenced time series data used in econometric analysis, provided direction of causality as well as assist us to determine both short and long-run relationship amongst the variables in this investigation.

Also in this research work, the following was tested:

1. Test for the co-efficient of determination ($\mathbf{R^2}$) as test to know the explanatory power-strength of the variables in the models (goodness of fit of the variables). In other words, it measures the percentage variation in the dependent variable that is explained by the independent variables.
2. Test of significance (**T-test**) of each of the parameter estimates.
3. In other words, it is a statistical test that is used to verify whether each of the parameters at 5 percent confidence level is significant or not.
4. Overall significance (**F-test**) of the explanatory variables in the model.
5. Durbin Watson test for autocorrelation. The Durbin-Watson (DW) statistical will be used to carry out the test for autocorrelation. Thus, Cookey (1998) states that ‘‘autocorrelation or serial dependence of the error term is when the successive values of the error term are serially correlated or dependent. That is, the value, which U assumes in any one period, depends on the value, which it assumed in the previous period’’.

The Co-Integration and Error Correction Model (ECM) Techniques

In this study we adopted the Co-Integration estimation technique in analyzing our data. Co-Integration is an econometric technique used for testing the correlation between non-stationary time series data. Usually, time series data are non-stationary due to fluctuations that do characterize such information. Two variables are said to be Co-Integrated if they have a long run or equilibrium relationship between them (Gujarati, 2007). Hence, co-integration technique has been developed to address the problem of spurious correlation often associated with some time series data. However, an extension of this in the co-integration technique is the error correction mechanism (ECM) (Engle and Granger, 1987). These authors have established that co-integration is a sufficient condition for an error correction model formulation.

The first stage of co-integration technique is the unit root test, otherwise called test of stationarity.There are two tests for co-integration. The first is the Engle-Granger method and the Johansen’s method.

Engle-Granger Approach: The basic purpose of the Engle-Granger Approach is to determine whether the residuals of the equilibrium relationship are stationary. Suppose two variables A (GDP) and B (exchange rate), used in our analysis are integrated of order 1 and we are interested in finding out the equilibrium relationship between the two variables, then this method suggests a straight forward test whether two variables are co-integrated of order 1(I) or not.

Johansen's Test Co-Integration:
The basic argument of Johansen's procedure is that the rank of matrix of variables can be used to determine whether or not the two variables are co-integrated.
Error Correction Model (ECM): According to Iyoha and Ekanem (2004), Error Correction Model (ECM) involves using lagged residual to correct for deviations of actual values from the long-run equilibrium values

Result And Discussions:-

This chapter presents the data used in carrying out the study as well as test the hypotheses. Thus, this chapter begins with the data presentation and thereafter talks about both the short and long run analysis of the regression results.

Data Presentation
This research examined international trade and economic growth in Nigeria during the period 1980-2013. A growth model was constructed for the Nigerian economy. The model has Real Gross Domestic Product (RGDP) as the dependent variable while exchange rate (EXR), Interest rate (INT) and Money supply (MS) are the independent variables. See Table 4.1 below.

Figure 4.1:-Line Graph Showing the Trend Analysis of GDP

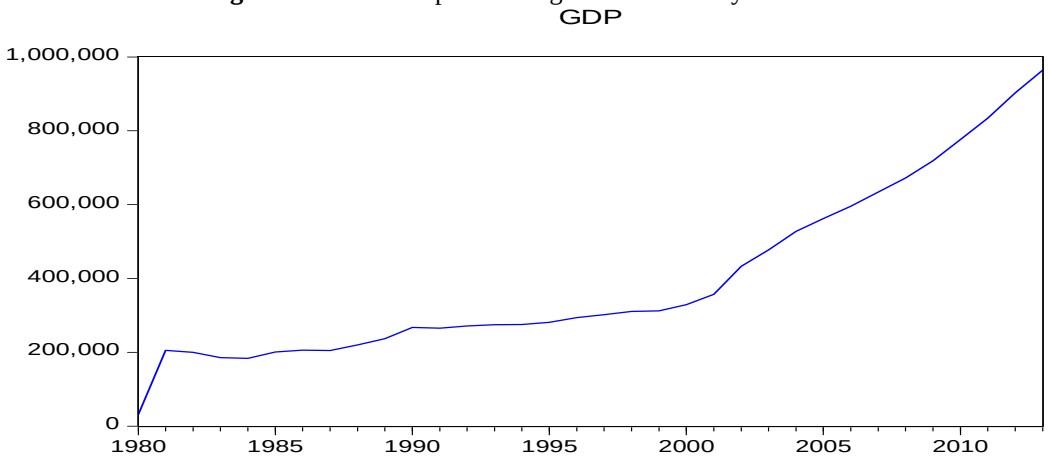

Table 4.1above shows that Gross Domestic Product (Real GDP) has been on increase from ₦315, 460.08 Million in 1980 to ₦267, 549.99 Million in 1990. Between 1991 and 2000, it rose from ₦265, 379.14 million to ₦329, 178.74 million. Thereafter it increased from ₦356, 994.26 million in 2001 to ₦₦964184.0 million in 20

Figure 4.2:-Line Graph Showing the Trend Analysis of EXR

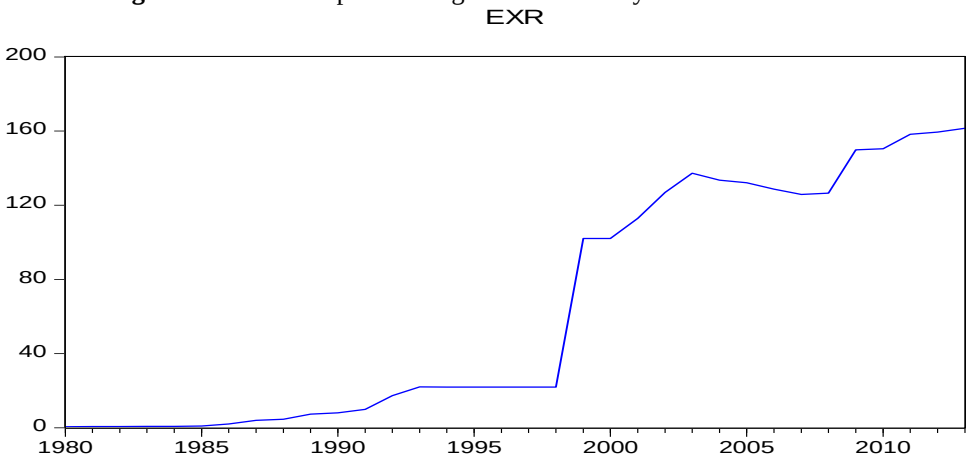

Table 4.2 also revealed that the exchange rate moved from its level of N0.54: US $ 1.00 in 1980 to N0.89: US $ N1.00 in 1985. Between 1986 and 1993 when structural adjustment program (SAP) was introduced, it rose from N2.02: US $1.00 to N22.05: US $1.00 from 1994 to 1998, there was a stable exchange rate of N21.89: US $1.00 this is as a result of exchange rate policy that was completely revised in 1994 with the

re-introduction of fixed exchange rate regime. Further between 1992 and 2013 the exchange rate rose again from N102.11: US $1.00 to N161.50: US $1.00.

Figure 4.3:-Line Graph Showing the Trend Analysis of INT

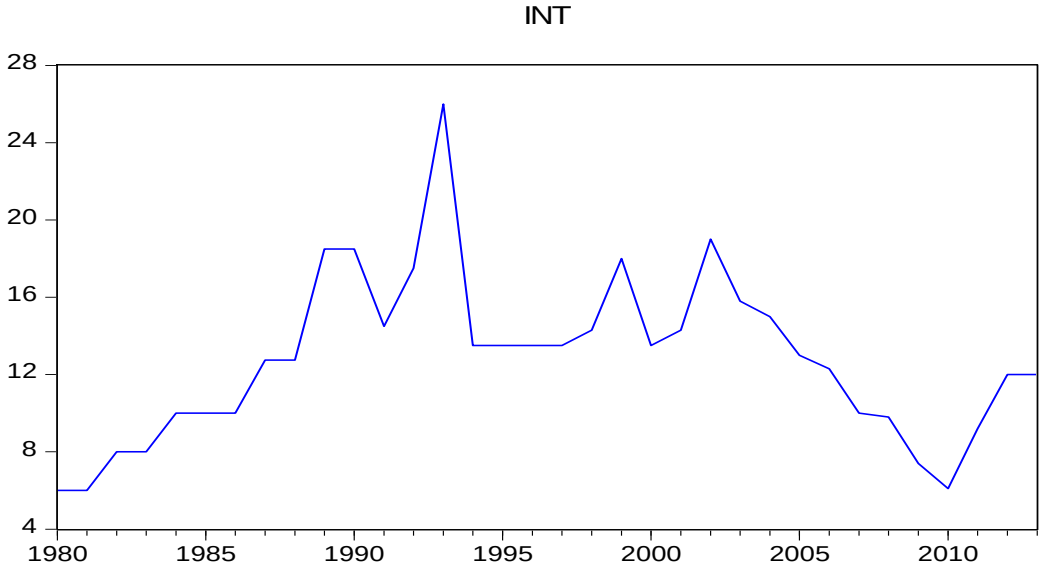

Table 4.3 above shows that interest rate (INT) has been on increase from ₦ 6 in 1980 to ₦18.5 in 1990. In 1991 it decreased to ₦ 14.5 then rose to 13.5 in 2000. Thereafter it increased to ₦ 14.3 in 2001 and then decreased to ₦₦12 in 2013.

Figure 4.4:-Line Graph Showing the Trend Analysis of MS

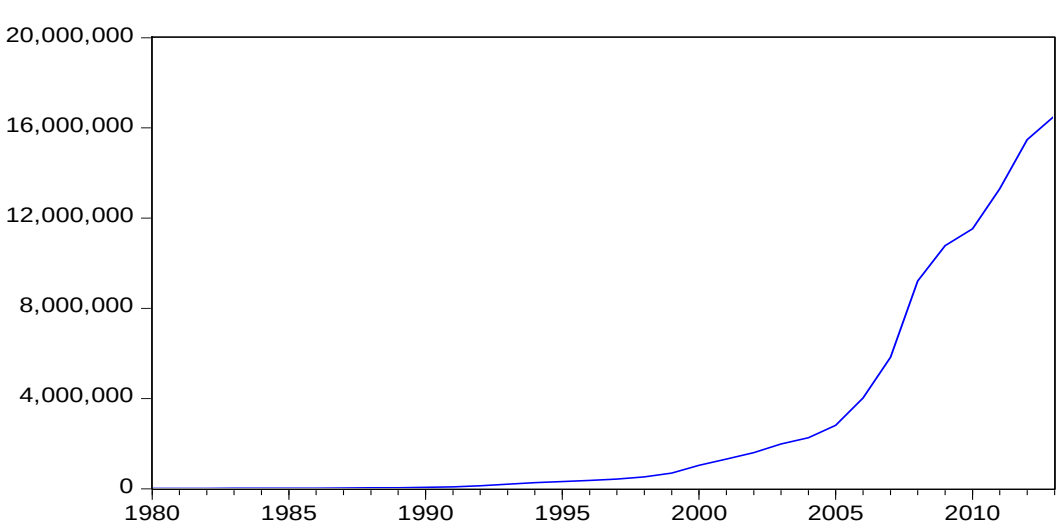

Table 4.4 above shows that Money Supply (MS) has been on increase from ₦15100.00 Million in 1980 to ₦68662.50 Million in 1990. Between 1991 and 2000, it rose from ₦87499.80 million to ₦1036080.0 million. Thereafter it increased from ₦1315869.million in 2001 to ₦₦16536750million in 2013.

The above scenario shows that the performance of the Nigerian economy has been inconsistence with particular reference to GDP, Exchange Rate and Interest Rate. The trends in the various variables used for our analysis are presented in the graphs below.

Hypotheses Testing

At this juncture we re-state the hypotheses in null form for testing.
Ho: There is no significant relationship between money supply and economic growth in Nigeria.
Ho: There is no significant relationship between interest rate and economic growth in Nigeria.
Ho: There is no significant relationship between exchange rate and economic growth in Nigeria.

Short Run Analysis of Result

The linear regression result is analyzed in table 4.2 below

Table 4.2:-Analysis of Short Run Result

Variable	Coefficient	t-Statistic	Prob
C	155155.7	5.285295	0.0000
EXR	1438.893	6.690603	0.0000
INT	4269.304	1.998938	0.0547
MS	0.031903	10.83461	0.0000
R^2=0.962273, F-Statistic=255.0612, DW=1.006116, Prob(F-stat=0.000000)			

Source: Authors' Computed Result from (E-views 8)

Discussion of Results and their Implications for the Hypotheses

The short run result as reported in table 4.2 above shows that the coefficient of determination- R^2 is 0.96, indicating that the variation in GDP explained by exchange rate (EXR), Interest rate (INT) and money supply (MS) is 96 percent. Therefore, the explanatory power of the model estimated is 96 percent.

Moreover, the coefficient of exchange rate (EXR) variable appeared with correct sign (positive) and statistically significant at 5 percent level. This conforms to the aprioriexpectation. However, the t-statistic calculated of 6.690603 is greater than the t-table value of 2.034. Thus, we reject the null hypothesis and accept the alternative hypothesis which states that there is a significant relationship between exchange rate and economic growth in Nigeria. This means that a unit increases in exchange rate will increase economic growth in Nigeria during the studied period. Also the result shows that exchange rate impact on economic growth in Nigeria during the period of study.

Nevertheless, the coefficient of Interest rate (INT) variable appeared with the wrong sign (positive) instead of negative but statistically significant at 5 percent level. This means that interest rate impact on economic growth in Nigeria during the period of study. However, the t-statistic calculated of 1.998938 is less than the t-table value of 2.034. Thus, we reject the alternative hypothesis and accept the null hypothesis which states that there is no significant relationship between interest rate and economic growth in Nigeria.

In addition, the coefficient of money supply (MS) variable appeared with correct sign (positive) and statistically significant at 5 percent level. This conforms to the apriori expectation. Nevertheless, the t-statistic calculated of 10.83461 is greater than the t-table value of 2.034. Thus, we reject the null hypothesis and accept the alternative hypothesis which states that there is a significant relationship between money supply and economic growth in Nigeria. This means that in the short run, a unit increases in money supply will increase economic growth in Nigeria during the studied period. Also, the result shows that money supply impact on economic growth in Nigeria during the period of study.This outcome is in confinement with the findings of Onyeiwu (2012) that monetary policy measured by money supply has a significant positive impact on GDP growth rate of output.

The entire regression model is significant given the f-value of 255.0612 with the probability (F-stat=0.000000). The Durbin Watson value of 1.006116 is far from 2.0, depicting the presence of serial autocorrelation. The analysis of the short run so far shows that the regression result is spurious. Given a high R^2 of 0.96, some variables appear with right sign while some with wrong sign and the DW shows the presence of serial autocorrelation. This may be as a result of non-stationarity of time series data that are used for the study. Therefore, there is need to carry out stationarity test and the long run analysis in order to confirm the long run equilibrium of the model.

Long Run Analysis of Result

Since most short run analyses may be characterized by spurious result, a stationarity test becomes necessary to stabilize the data. However,unit root test in this study is use to investigate whether or not growth rate of output, exchange rate, money supply and interest rate time series are stationary and to find out their order of integration. This was followed by the Johansen co-integration test and the error correction mechanism to determine whether a long run equilibrium relationship exists between the variables.

Unit Root Test for Stationarity (Augmented Dickey Fuller)

Table 4.3:-Unit Root Stationarity Test

Variables	**ADF Test**	**Critical Value**			**Order of integration**
		1% critical value	**5%critical value**	**10%critical value**	
GDP	6.675360	-3.653730	-2.957110	-2.617434	(0)=At Level
EXR	-5.835808	-3.653730	-2.957110	-2.617434	(1)=1St Diff.
INT	-5.966244	-3.661661	-2.960411	-2.619160	(1)=1St Diff.
MS	5.301300	-3.737853	-2.991878	-2.635542	(2)=2St Diff.

Source: Authors' Computed Result from (E-views 8)

The stationarity test presented in Table 4.3 shows that at various levels of significance (1%, 5% and 10%), the variables were stationary. From the result GDP and money supply were integrated of order zero (at level) and order two (second difference) respectively, while exchange rate and interest rate were integrated of order one (first difference). Hence, the entire variables in this study are stationary.This therefore means that the best regression resultswill be obtained when the above variables are use to estimate the model. The reason for this is that using the OLS regression techniques at levels in estimating the model would lead to spurious regression results since some of the variables were not stationary.

Johansen Test for Co-integration

Co-integration is conducted based on the test proposed by Johansen. According to Iyoha and Ekanem, (2002) co-integration deals with the methodology of modeling non-stationary time series variables. For detail result of the Johansen co-integration, see the table 4.4 below.

Table 4.4:-Test for co-integration

Eigen value	**Trace Statistics**	**5% critical value**	**Prob. ****	**Hypothesis of CE(s)**
0.612374	62.62618	47.85613	0.0012	None *****
0.518986	34.19478	29.79707	0.0146	At most 1*****
0.322533	12.23903	15.49471	0.1458	At most 2
0.018402	0.557209	3.841466	0.4554	At most 3

Source: Computed Result Using (E-Views 8)

From the Table 4.4 above, it shows that there are two co- integrating equations at 5% level of significance. This is because the Trace Statistic is greater than critical values at 5%. This is strong evidence from the unit root test conducted, where all the variables were stationary at various levels. Therefore, there exists a long-run relationship or equilibrium among the variables. Given that there are two co-integrating equations, the requirement for fitting in an error correction model is satisfied.

Error Correction Model (ECM)

Error correction model (ECM) is a means of integrating the short-run behaviour of an economic variable with its long-run behaviour (Gujarati and Sangeetha, 2008). The table below shows an inference error correction test conducted:

Table 4.5:-Over Parametarized Error Correction Model

Dependent Variable: DLOG(GDP)		
Method: Least Squares		

Date: 11/14/15 Time: 15:10				
Sample (adjusted): 1984 2013				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.062984	0.031091	2.025805	0.0638
DLOG(GDP(-1))	0.488849	0.224027	2.182098	0.0481
DLOG(GDP(-2))	-0.022460	0.180981	-0.124101	0.9031
DLOG(GDP(-3))	-0.006389	0.025764	-0.247975	0.8080
DLOG(EXR)	-0.058301	0.024548	-2.374936	0.0336
DLOG(EXR(-1))	0.012737	0.026001	0.489886	0.6324
DLOG(EXR(-2))	0.016130	0.025449	0.633822	0.5372
DLOG(EXR(-3))	0.040045	0.028755	1.392642	0.1871
DLOG(INT)	0.038129	0.045300	0.841707	0.4152
DLOG(INT(-1))	0.002821	0.045059	0.062617	0.9510
DLOG(INT(-2))	-0.053054	0.043603	-1.216746	0.2453
DLOG(INT(-3))	0.007466	0.040074	0.186312	0.8551
DLOG(MS)	-0.028920	0.075172	-0.384720	0.7067
DLOG(MS(-1))	-0.067870	0.084352	-0.804599	0.4355
DLOG(MS(-2))	0.088639	0.089662	0.988590	0.3409
DLOG(MS(-3))	-0.133986	0.084373	-1.588022	0.1363
ECM(-1)	-0.071922	0.065516	-1.097781	0.2922
R-squared	0.708340	Mean dependent var		0.054923
Adjusted R-squared	0.349374	S.D. dependent var		0.043844
S.E. of regression	0.035365	Akaike info criterion		-3.549086
Sum squared resid	0.016259	Schwarz criterion		-2.755074
Log likelihood	70.23629	Hannan-Quinn criter.		-3.295075
F-statistic	1.973278	Durbin-Watson stat		2.022783
Prob(F-statistic)	0.111021			

Source: Computed Result from (E-view 8)

Table 4.5 shows the results of the over-parameterized error correction model GDP model. The reason for the over-parameterized specification is to show the main dynamic processes in the model and as well sets the lag length such that the dynamic processes would not be constrained by too long a lag length.

The over-parameterized is transform in order to achieve the parsimonious ECM to make it more interpretable for policy implementation. The parsimonious error correction result is presented in Table 4.6.

Table 4.6:-Parsimonious Error Correction Model

Dependent Variable: DLOG(GDP)				
Method: Least Squares				
Date: 11/14/15 Time: 15:30				
Sample (adjusted): 1984 2013				
Included observations: 30 after adjustments				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026890	0.021675	1.240599	0.2299
DLOG(GDP(-1))	0.435490	0.204912	2.125252	0.0469
DLOG(GDP(-2))	0.019003	0.169400	0.112179	0.9119
DLOG(GDP(-3))	0.005171	0.024833	0.208214	0.8373
DLOG(EXR(-2))	0.013959	0.023532	0.593214	0.5600
DLOG(EXR(-3))	0.058369	0.024887	2.345363	0.0300
DLOG(INT(-2))	-0.066068	0.037064	-1.782519	0.0907
DLOG(INT(-3))	-0.009868	0.037930	-0.260174	0.7975
DLOG(MS(-2))	0.048143	0.077930	0.617773	0.5441
DLOG(MS(-3))	-0.081706	0.078582	-1.039747	0.3115
ECM(-1)	-0.028566	0.060434	-0.472678	0.6418
R-squared	0.530956	Mean dependent var		0.054923
Adjusted R-squared	0.284090	S.D. dependent var		0.043844
S.E. of regression	0.037097	Akaike info criterion		-3.473977
Sum squared resid	0.026148	Schwarz criterion		-2.960205
Log likelihood	63.10966	Hannan-Quinn criter.		-3.309617
F-statistic	2.150790	Durbin-Watson stat		1.938506
Prob(F-statistic)	0.072399			

The parsimonious error correction model in Table 4.6 indicates that the dynamic model is a good fit. This is so because the variation in the regressors account for 53 percent of the total variation in the model based on the R^2. Put differently, the R^2 value of 0.53 indicates that the variation in GDP explained by interest rate, money supply and exchange rate is 53 percentwhile 47 percent is unexplained due to error term. This shows a more realistic value of R^2 than 96 percent value in the short run. Also, the value of f-statistic at 255.0612 in the short run equally reduces to 2.150790, implying that the overall regression result is significant. Therefore, we accept the alternative hypothesis which says the overall model is significant. The Durbin Watson (DW) value of 1.9 suggests lesser level of autocorrelation.

Furthermore, an important attribute to be noticed in Table 4.6 is the coefficient of the parameter of error correction term. The coefficient of the error correction term appears with the right sign (negative) but statistically insignificant at 5 percent level. This result reveals that monetary policy variables adjust rapidly to long run dynamic during the period of our study.

Moreover, the coefficient of the lag two value of exchange rate is rightly signed but statistically not significant at 5 percent level. The implication of this result is that exchange rate aloneas a monetary policy tool will not significantly increase economic growth during the period of study. Put differently, the implication of this finding is that Nigeria's exchange rate variation is not capable of affecting GDP significantly during the period of study. Meaning that exchange rate is not a major determinant of gross domestic product in Nigeria during the period of study. Therefore, this study rejects the alternative hypothesis and concludes that there is no significant relationship between exchange rate and economic growth in Nigeria.This outcome is consistent with the findings ofChinwuba, Akhor and Akwaden (2015) that exchange rate exerts insignificant influence on growth of output in Nigeria.

Nevertheless, the coefficient of lag two value of interest rate is rightly signed (negative) and statistically significant at 5 percent level. The implication of this result is that interest rate variable significantly increases economic growth

during the period of study. Therefore, this study rejects the null hypothesis and concludes thatthere is a significant relationship between interest rate and economic growth in Nigeria.

Furthermore, the coefficient of the lag two value of Money Supply is rightly signed (positive) but statistically not significant at 5 percent level. The implication of this result is that money supply alone as a monetary policy tool will not significantly increase economic growth during the period of study. It also implies that money supply does not have a significant predictive power in explaining the growth of real GDP.Therefore, this study rejects the alternative hypothesis and concludes that there is no significant relationship between money supply and economic growth in Nigeria.This outcome is not consistent with the findings ofChinwuba, Akhor and Akwaden (2015) that money supply exerts significant influence on growth of output in Nigeria. As well as Uduakobong (2014) that money supply does not only have a positive impact on economic growth in Nigeria, but such impact is strongly and statistically significant.

Momentously, the result indicates that only interest rate exerts significant impact on economic growth in Nigeria while other variables do not. Despite the fact that exchange rate and money supply possessed the expected signs they do not significantly impact on economic growth. Theoretically, the parsimonious ECM result shows that a well coordinated monetary policy will help to enhance economic growth during the period covered by this study.

Discussion of Findings

The findings of the long-run regression results are as follows:

The long run dynamic result shows that the coefficient of exchange rate is rightly signed but statistically not significant at 5 percent level in stimulating economic growth in Nigeria during the period of study. However, the sign is consistent with the apriori expectation. Therefore, we reject the alternative hypothesis and conclude that there is no significant relationship between exchange rate and economic growth in Nigeria.

The policy implication here is that the monetary authorities' exchange rate policy has not significantly enhanced or increased economic growth of the country during the period of study. Hence, a well managedexchange rate policy by the monetary authority has the potential to stimulate economic growth in Nigeria. Thus, adequate macroeconomic policies that will improve the Nigerian economy should be enhanced.

The long run dynamic result shows that the coefficient of interest rate is rightly signed and statistically significant at 5 percent level in stimulating economic growth in Nigeria during the period of study. This is consistent with the apriori expectation. Therefore, we reject the null hypothesis and conclude that there is a significant relationship between interest rate and economic growth in Nigeria.

The policy implication of this result is that interest rate variable significantly increases economic growth during the period of study. This means that interest rate reforms have a strong positive impact on economic growth in Nigeria.

Strictly speaking, it implies that the monetary authorities' interest rate policy has enhanced economic growth of the country during the period of study. Hence, a well managedinterest rate policy by the monetary authority has the potential to increase economic growth in Nigeria.

The long run dynamic result shows that the coefficient of Money Supply is rightly signed (positive) but statistically not significant at 5 percent level. However, the sign is consistent with the apriori expectation.Meaning that money supply impact on economic growth positively but not significantly. Therefore, we reject the alternative hypothesis and conclude that there is no significant relationship between money supply and economic growth in Nigeria.

The policy implication here is that despite the policy redirection of monetary authorities towards controlling money supply; money supply has not contributed very significantly to enhance economic growth in Nigeria during the period of study. Meaning that money supply alone as a monetary policy tool will not significantly lead to an increase in economic growth in Nigeria during the period of study. Therefore, money supply as a monetary policy tool with other variable factors is needed in the coordination of the Nigerian economy in other to enhance economic growth in Nigeria.

The long run dynamic (ECM) result also shows that there exists a long-run relationship or equilibrium among the variables. This is because the coefficient of ECM is rightly signed (that is negative).

The policy implication is that the problems or difficulties in the monetary policy operations will be reconciled in the long run by right or appropriate monetary policy formulation and implementation.

Conclusion:-

This study examines impact of monetary policy operations on economic growth in Nigeria from 1980-2013. Based on the findings stated in 5.1the research concludes that there should be co-operation between the monetary and fiscal authorities to ensure smooth co-ordination and consistency in monetary and fiscal pursuits. Put differently, the combination and coordination of both monetary and fiscal policies are highly recommended for the Nigerian economy. Moreover, deliberate efforts should be made by monetary authorities to fine-tune the various monetary policies in order to provide an enabling environment that will stimulate economic growth in Nigeria.

Recommendations

Based on the findings of the study, we make the following recommendations.

For Policy

1. There should be continuity and consistency of macroeconomic policy measures in the Nigerian economy to redress the problem of exchange rate variation in order to boost economic growth. The exchange rate should find its equilibrium level to make economic growth position viable.
2. We recommend that monetary authority should review her interest rate policies to stimulate investment and increase economic growth in Nigeria. That is, make the financial sector to be strong to provide credit at lower interest rate which in turn will stimulate economic growth in Nigeria.
3. We recommend that there should be co-operation between the monetary and fiscal authorities to ensure smooth co-ordination and consistency in monetary and fiscal pursuits. Put differently, the combination and coordination of both monetary and fiscal policies are highly recommended for the Nigerian economy. The manufacturing industries should be supported to improve on their production so that their output would be increased. This can be achieve by revamping all the industries that are performing below capacity, encourage locally industries, locally made goods and encourage exportation of manufactured or finished goods to increase economic growth.
4. We also recommend that monetary authorities should promote activities in all the sectors of the economy particularly the agriculture and industrial sectors to increase output and reduce the rate of dependence on foreign goods to the beariest minimum.t achieve this, government/monetary authorities should increase capital investment in the agricultural and manufacturing sectors to improve their output. In addition, government should deliberately improve the functional relationship between the agricultural sector, industrial sector, research centres and schools, so that whatever is discovered in the research centres and schools can be put to practice in the agricultural and industrial sectors to increase efficiency and output.

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APPENDIX: 1

YEAR	GDP(₦ million)	EXR(₦ /$)	INT	MS(₦ million)
1980	31546.08	0.540000	6	15100.00
1981	205222.1	0.610000	6	16161.70
1982	199685.2	0.670000	8	18093.60
1983	185598.1	0.720000	8	20879.10
1984	183563.0	0.760000	10	23370.00
1985	201036.3	0.890000	10	26277.60
1986	205971.4	2.020000	10	27389.80
1987	204804.5	4.020000	12.75	33667.40
1988	219875.6	4.540000	12.75	45446.90
1989	236729.6	7.390000	18.5	47055.00
1990	267550.0	8.010000	18.5	68662.50
1991	265379.1	9.910000	14.5	87499.80
1992	271365.5	17.30000	17.5	129085.5
1993	274833.3	22.05000	26	198479.2
1994	275450.6	21.89000	13.5	266944.9
1995	281407.4	21.89000	13.5	318763.5
1996	293745.4	21.89000	13.5	370333.5
1997	302022.5	21.89000	13.5	429731.3
1998	310890.0	21.89000	14.3	525637.8
1999	312183.5	102.1100	18	699733.7
2000	329178.7	102.1100	13.5	1036080.
2001	356994.3	112.9400	14.3	1315869.
2002	433203.5	126.8800	19	1599495.
2003	477533.0	137.2200	15.8	1985192.
2004	527576.0	133.5000	15	2263588.
2005	561931.4	132.1500	13	2814846.
2006	595821.6	128.6500	12.3	4027902.
2007	634251.1	125.8300	10	5832488.
2008	672202.6	126.4800	9.8	9208463.
2009	718977.3	149.9000	7.4	10780627
2010	776332.2	150.4800	6.1	11525530
2011	834161.9	158.2100	9.2	13303494
2012	902794.0	159.3900	12	15483848
2013	964184.0	161.5000	12	16536750

Source: *CBN Statistical Bulletin (Various Issues)*

Appendix ii: regression results

Linear regression result

Dependent Variable: GDP				
Method: Least Squares				
Date: 11/20/15 Time: 13:16				
Sample: 1980 2013				
Included observations: 34				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	155155.7	29356.11	5.285295	0.0000
EXR	1438.893	215.0618	6.690603	0.0000

INT	4269.304	2135.786	1.998938	0.0547
MS	0.031903	0.002945	10.83461	0.0000
R-squared	0.962273	Mean dependent var		397470.6
Adjusted R-squared	0.958500	S.D. dependent var		236234.2
S.E. of regression	48124.49	Akaike info criterion		24.51110
Sum squared resid	6.95E+10	Schwarz criterion		24.69067
Log likelihood	-412.6887	Hannan-Quinn criter.		24.57234
F-statistic	255.0612	Durbin-Watson stat		1.006116
Prob(F-statistic)	0.000000			

Log-Linear Regression Result

Dependent Variable: LOG(GDP)				
Method: Least Squares				
Date: 11/20/15 Time: 13:19				
Sample: 1980 2013				
Included observations: 34				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.073797	1.626508	4.349069	0.0001
LOG(EXR)	-0.183017	0.137586	-1.330199	0.1935
LOG(INT)	0.447539	0.270441	1.654851	0.1084
LOG(MS)	0.391672	0.111535	3.511661	0.0014
R-squared	0.804313	Mean dependent var		12.71213
Adjusted R-squared	0.784744	S.D. dependent var		0.657052
S.E. of regression	0.304843	Akaike info criterion		0.572094
Sum squared resid	2.787885	Schwarz criterion		0.751666
Log likelihood	-5.725596	Hannan-Quinn criter.		0.633333
F-statistic	41.10203	Durbin-Watson stat		1.383269
Prob(F-statistic)	0.000000			

Appendix Iii: Unit Root Test
GDP

Null Hypothesis: GDP has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic			6.675360	1.0000
Test critical values:	1% level		-3.653730	
	5% level		-2.957110	
	10% level		-2.617434	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(GDP)				
Method: Least Squares				
Date: 11/20/15 Time: 13:20				
Sample (adjusted): 1982 2013				
Included observations: 32 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.092391	0.013841	6.675360	0.0000
D(GDP(-1))	0.007440	0.082515	0.090161	0.9288
C	-12627.83	5566.123	-2.268695	0.0309
R-squared	0.653588	Mean dependent var		23717.56
Adjusted R-squared	0.629698	S.D. dependent var		24297.04
S.E. of regression	14785.34	Akaike info criterion		22.12972
Sum squared resid	6.34E+09	Schwarz criterion		22.26713
Log likelihood	-351.0755	Hannan-Quinn criter.		22.17527
F-statistic	27.35773	Durbin-Watson stat		1.189761
Prob(F-statistic)	0.000000			

Exr

Null Hypothesis: EXR has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.130001	0.9378
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	

	10% level		-2.615817	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EXR)				
Method: Least Squares				
Date: 11/20/15 Time: 13:23				
Sample (adjusted): 1981 2013				
Included observations: 33 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR(-1)	-0.005434	0.041800	-0.130001	0.8974
C	5.212633	3.646939	1.429317	0.1629
R-squared	0.000545	Mean dependent var		4.877576
Adjusted R-squared	-0.031696	S.D. dependent var		14.59269
S.E. of regression	14.82215	Akaike info criterion		8.288814
Sum squared resid	6810.579	Schwarz criterion		8.379511
Log likelihood	-134.7654	Hannan-Quinn criter.		8.319331
F-statistic	0.016900	Durbin-Watson stat		2.109200
Prob(F-statistic)	0.897406			

Exr

Null Hypothesis: D(EXR) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.835808	0.0000
Test critical values:	1% level		-3.653730	
	5% level		-2.957110	
	10% level		-2.617434	
*MacKinnon (1996) one-sided p-values.				

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EXR,2)				
Method: Least Squares				
Date: 11/20/15 Time: 13:23				
Sample (adjusted): 1982 2013				
Included observations: 32 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR(-1))	-1.062157	0.182007	-5.835808	0.0000
C	5.336364	2.803979	1.903140	0.0667
R-squared	0.531665	Mean dependent var		0.063750
Adjusted R-squared	0.516053	S.D. dependent var		21.58478
S.E. of regression	15.01573	Akaike info criterion		8.316535
Sum squared resid	6764.160	Schwarz criterion		8.408143
Log likelihood	-131.0646	Hannan-Quinn criter.		8.346900
F-statistic	34.05665	Durbin-Watson stat		1.997697
Prob(F-statistic)	0.000002			

Int

Null Hypothesis: INT has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-2.814477	0.0671
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	
	10% level		-2.615817	
*MacKinnon (1996) one-sided p-values.				

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(INT)				
Method: Least Squares				
Date: 11/20/15 Time: 13:25				
Sample (adjusted): 1981 2013				
Included observations: 33 after adjustments				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT(-1)	-0.364926	0.129660	-2.814477	0.0084
C	4.850659	1.751096	2.770071	0.0094
R-squared	0.203521	Mean dependent var		0.181818
Adjusted R-squared	0.177828	S.D. dependent var		3.552922
S.E. of regression	3.221566	Akaike info criterion		5.236304
Sum squared resid	321.7332	Schwarz criterion		5.327002
Log likelihood	-84.39902	Hannan-Quinn criter.		5.266821
F-statistic	7.921282	Durbin-Watson stat		2.182920
Prob(F-statistic)	0.008413			

Int

Null Hypothesis: D(INT) has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.966244	0.0000
Test critical values:	1% level		-3.661661	
	5% level		-2.960411	
	10% level		-2.619160	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(INT,2)				
Method: Least Squares				
Date: 11/20/15 Time: 13:25				
Sample (adjusted): 1983 2013				
Included observations: 31 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-1.689669	0.283205	-5.966244	0.0000

D(INT(-1),2)	0.337936	0.178834	1.889668	0.0692
C	0.231993	0.618506	0.375086	0.7104
R-squared	0.675022	Mean dependent var		-0.064516
Adjusted R-squared	0.651810	S.D. dependent var		5.821858
S.E. of regression	3.435342	Akaike info criterion		5.397876
Sum squared resid	330.4442	Schwarz criterion		5.536649
Log likelihood	-80.66708	Hannan-Quinn criter.		5.443112
F-statistic	29.07988	Durbin-Watson stat		1.944543
Prob(F-statistic)	0.000000			

Ms

Null Hypothesis: MS has a unit root				
Exogenous: Constant				
Lag Length: 8 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			1.191101	0.9971
Test critical values:	1% level		-3.724070	
	5% level		-2.986225	
	10% level		-2.632604	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(MS)				
Method: Least Squares				
Date: 11/20/15 Time: 13:26				
Sample (adjusted): 1989 2013				
Included observations: 25 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MS(-1)	2.298580	1.929795	1.191101	0.2521
D(MS(-1))	-2.984390	2.080620	-1.434375	0.1720
D(MS(-2))	-2.967870	2.165581	-1.370473	0.1907
D(MS(-3))	-3.276334	2.214283	-1.479637	0.1597
D(MS(-4))	-1.999346	2.322860	-0.860726	0.4029
D(MS(-5))	-5.963135	2.314928	-2.575948	0.0211

D(MS(-6))	0.159971	3.174367	0.050395	0.9605
D(MS(-7))	-3.664723	2.742037	-1.336496	0.2013
D(MS(-8))	13.06496	2.986058	4.375320	0.0005
C	-30158.30	68607.05	-0.439580	0.6665
R-squared	0.955481	Mean dependent var		659652.1
Adjusted R-squared	0.928769	S.D. dependent var		869852.6
S.E. of regression	232156.2	Akaike info criterion		27.83738
Sum squared resid	8.08E+11	Schwarz criterion		28.32493
Log likelihood	-337.9673	Hannan-Quinn criter.		27.97261
F-statistic	35.77021	Durbin-Watson stat		1.168495
Prob(F-statistic)	0.000000			

Ms

Null Hypothesis: D(MS) has a unit root				
Exogenous: Constant				
Lag Length: 8 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			1.169717	0.9969
Test critical values:	1% level		-3.737853	
	5% level		-2.991878	
	10% level		-2.635542	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(MS,2)				
Method: Least Squares				
Date: 11/20/15 Time: 13:26				
Sample (adjusted): 1990 2013				
Included observations: 24 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MS(-1))	4.968449	4.247567	1.169717	0.2616
D(MS(-1),2)	-5.827302	4.612814	-1.263286	0.2271
D(MS(-2),2)	-5.982759	4.723223	-1.266669	0.2259
D(MS(-3),2)	-6.490900	4.812409	-1.348784	0.1988

D(MS(-4),2)	-5.177780	5.073717	-1.020510	0.3248
D(MS(-5),2)	-8.281339	5.360026	-1.545019	0.1446
D(MS(-6),2)	-4.640932	5.361028	-0.865680	0.4013
D(MS(-7),2)	-7.356804	4.618449	-1.592916	0.1335
D(MS(-8),2)	9.172653	4.599393	1.994318	0.0660
C	29094.73	62286.86	0.467109	0.6476
R-squared	0.929585	Mean dependent var		43803.91
Adjusted R-squared	0.884318	S.D. dependent var		652249.7
S.E. of regression	221843.7	Akaike info criterion		27.75167
Sum squared resid	6.89E+11	Schwarz criterion		28.24253
Log likelihood	-323.0200	Hannan-Quinn criter.		27.88189
F-statistic	20.53563	Durbin-Watson stat		2.114591
Prob(F-statistic)	0.000001			

Ms

Null Hypothesis: D(MS,2) has a unit root				
Exogenous: Constant				
Lag Length: 7 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			5.301300	1.0000
Test critical values:	1% level		-3.737853	
	5% level		-2.991878	
	10% level		-2.635542	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(MS,3)				
Method: Least Squares				
Date: 11/20/15 Time: 13:27				
Sample (adjusted): 1990 2013				
Included observations: 24 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MS(-1),2)	9.630596	1.816648	5.301300	0.0001
D(MS(-1),3)	-11.06477	1.881747	-5.880053	0.0000

D(MS(-2),3)	-11.52502	1.880805	-6.127707	0.0000
D(MS(-3),3)	-12.38960	1.840622	-6.731204	0.0000
D(MS(-4),3)	-11.63550	1.778593	-6.541970	0.0000
D(MS(-5),3)	-13.69025	2.324749	-5.888914	0.0000
D(MS(-6),3)	-12.19132	1.857062	-6.564841	0.0000
D(MS(-7),3)	-14.29748	1.416737	-10.09183	0.0000
C	49301.21	60573.55	0.813907	0.4284
R-squared	0.961939	Mean dependent var		-46553.36
Adjusted R-squared	0.941639	S.D. dependent var		929506.1
S.E. of regression	224550.2	Akaike info criterion		27.76158
Sum squared resid	7.56E+11	Schwarz criterion		28.20335
Log likelihood	-324.1390	Hannan-Quinn criter.		27.87878
F-statistic	47.38740	Durbin-Watson stat		2.433041
Prob(F-statistic)	0.000000			

Appendix Iv: Johansen Cointegration Test

Date: 11/20/15 Time: 13:28				
Sample (adjusted): 1982 2013				
Included observations: 32 after adjustments				
Trend assumption: Linear deterministic trend				
Series: GDP EXR INT MS				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.756633	73.09180	47.85613	0.0000
At most 1	0.431518	27.86992	29.79707	0.0821
At most 2	0.263273	9.796767	15.49471	0.2967
At most 3	0.000610	0.019541	3.841466	0.8887
Trace test indicates 1 cointegratingeqn(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		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**

None *	0.756633	45.22188	27.58434	0.0001
At most 1	0.431518	18.07315	21.13162	0.1271
At most 2	0.263273	9.777226	14.26460	0.2270
At most 3	0.000610	0.019541	3.841466	0.8887
Max-eigenvalue test indicates 1 cointegratingeqn(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):				
GDP	EXR	INT	MS	
-8.31E-06	0.035058	0.066895	2.86E-07	
-2.96E-05	0.031757	0.256590	9.45E-07	
-1.30E-05	0.019272	-0.166587	5.38E-07	
-8.84E-06	0.030281	-0.148805	-2.44E-07	
Unrestricted Adjustment Coefficients (alpha):				
D(GDP)	14463.79	347.5070	3014.590	19.51850
D(EXR)	-1.015799	0.383047	-1.110640	0.350750
D(INT)	-0.335171	-0.477457	1.522033	0.032108
D(MS)	144820.4	-315589.4	-31140.34	-999.3265
1 Cointegrating Equation(s):		Log likelihood	-1013.650	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	-4217.498	-8047.372	-0.034420	
	(414.258)	(4272.52)	(0.00714)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.120232			
	(0.01652)			
D(EXR)	8.44E-06			
	(2.3E-05)			
D(INT)	2.79E-06			
	(5.4E-06)			
D(MS)	-1.203834			

	(0.80341)			
2 Cointegrating Equation(s):		Log likelihood	-1004.613	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	0.000000	-8884.020	-0.031106	
		(3253.52)	(0.00509)	
0.000000	1.000000	-0.198376	7.86E-07	
		(1.42468)	(2.2E-06)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.130515	518.1131		
	(0.06106)	(93.9636)		
D(EXR)	-2.89E-06	-0.023448		
	(8.7E-05)	(0.13339)		
D(INT)	1.69E-05	-0.026913		
	(2.0E-05)	(0.03052)		
D(MS)	8.134884	-4945.154		
	(2.28168)	(3511.48)		
3 Cointegrating Equation(s):		Log likelihood	-999.7243	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	0.000000	0.000000	-0.034864	
			(0.00612)	
0.000000	1.000000	0.000000	7.02E-07	
			(2.2E-06)	
0.000000	0.000000	1.000000	-4.23E-07	
			(5.4E-07)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.169780	576.2107	554.5242	
	(0.06331)	(96.8646)	(593.856)	
D(EXR)	1.16E-05	-0.044852	0.215353	
	(9.4E-05)	(0.14360)	(0.88040)	
D(INT)	-2.91E-06	0.002419	-0.398483	
	(1.9E-05)	(0.02922)	(0.17913)	
D(MS)	8.540485	-5545.295	-66101.89	
	(2.46969)	(3778.87)	(23167.5)	

Johansen Cointegration Test Date: 11/20/15 Time: 13:29				
Sample (adjusted): 1983 2013				
Included observations: 31 after adjustments				
Trend assumption: Linear deterministic trend				
Series: GDP EXR INT MS				
Lags interval (in first differences): 1 to 2				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.729373	72.69716	47.85613	0.0001
At most 1 *	0.453401	32.17972	29.79707	0.0261
At most 2	0.351650	13.45446	15.49471	0.0992
At most 3	0.000690	0.021407	3.841466	0.8836
Trace test indicates 2 cointegratingeqn(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		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.729373	40.51744	27.58434	0.0006
At most 1	0.453401	18.72525	21.13162	0.1051
At most 2	0.351650	13.43305	14.26460	0.0673
At most 3	0.000690	0.021407	3.841466	0.8836
Max-eigenvalue test indicates 1 cointegratingeqn(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):				
GDP	EXR	INT	MS	
-3.88E-05	0.088994	0.229838	1.24E-06	

-2.22E-05	-0.005226	0.206014	6.45E-07	
8.32E-06	-0.002235	0.194138	-4.97E-07	
1.83E-06	-0.011542	0.266152	5.26E-07	
Unrestricted Adjustment Coefficients (alpha):				
D(GDP)	9402.082	-2214.229	-2035.415	-23.58567
D(EXR)	-2.030638	0.718478	0.722625	-0.372468
D(INT)	-0.036460	0.129674	-1.773796	-0.027604
D(MS)	-98835.45	-313225.9	-17662.27	1150.016
1 Cointegrating Equation(s):		Log likelihood	-968.1999	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	-2290.997	-5916.786	-0.031851	
	(173.745)	(1285.47)	(0.00216)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.365224			
	(0.06355)			
D(EXR)	7.89E-05			
	(0.00012)			
D(INT)	1.42E-06			
	(2.7E-05)			
D(MS)	3.839264			
	(4.00127)			
2 Cointegrating Equation(s):		Log likelihood	-958.8373	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	0.000000	-8960.169	-0.029279	
		(3638.76)	(0.00610)	
0.000000	1.000000	-1.328410	1.12E-06	
		(1.66544)	(2.8E-06)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.316030	848.2984		
	(0.06994)	(139.330)		

D(EXR)	6.29E-05	-0.184469		
	(0.00014)	(0.27826)		
D(INT)	-1.46E-06	-0.003922		
	(3.1E-05)	(0.06174)		
D(MS)	10.79832	-7158.821		
	(3.44844)	(6869.72)		
3 Cointegrating Equation(s):		Log likelihood	-952.1207	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	0.000000	0.000000	-0.037745	
			(0.00706)	
0.000000	1.000000	0.000000	-1.32E-07	
			(2.5E-06)	
0.000000	0.000000	1.000000	-9.45E-07	
			(6.5E-07)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.332958	852.8479	1309.639	
	(0.06821)	(133.627)	(546.395)	
D(EXR)	6.89E-05	-0.186084	-0.178412	
	(0.00014)	(0.27799)	(1.13670)	
D(INT)	-1.62E-05	4.23E-05	-0.326026	
	(2.6E-05)	(0.05121)	(0.20940)	
D(MS)	10.65142	-7119.343	-90673.86	
	(3.50311)	(6863.28)	(28063.6)	

Johansen Cointegration Test

Date: 11/20/15 Time: 13:31				
Sample (adjusted): 1984 2013				
Included observations: 30 after adjustments				
Trend assumption: Linear deterministic trend				
Series: GDP EXR INT MS				
Lags interval (in first differences): 1 to 3				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.612374	62.62618	47.85613	0.0012

At most 1 *	0.518986	34.19478	29.79707	0.0146
At most 2	0.322533	12.23903	15.49471	0.1458
At most 3	0.018402	0.557209	3.841466	0.4554
Trace test indicates 2 cointegratingeqn(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		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.612374	28.43140	27.58434	0.0389
At most 1 *	0.518986	21.95575	21.13162	0.0382
At most 2	0.322533	11.68182	14.26460	0.1232
At most 3	0.018402	0.557209	3.841466	0.4554
Max-eigenvalue test indicates 2 cointegratingeqn(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):				
GDP	EXR	INT	MS	
2.56E-05	0.017294	-0.147328	-9.62E-07	
7.55E-05	-0.166224	-0.429878	-2.30E-06	
8.66E-07	-0.016751	0.362588	-1.79E-07	
-7.17E-06	0.029303	0.249760	9.48E-07	
Unrestricted Adjustment Coefficients (alpha):				
D(GDP)	1449.392	-3011.045	-3150.741	-88.48870
D(EXR)	0.961041	4.440872	1.329090	-1.746769
D(INT)	-1.032782	1.032475	-1.284112	-0.096126
D(MS)	283666.8	115197.4	-60651.48	21375.03
1 Cointegrating Equation(s):		Log likelihood	-922.2193	

Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	675.1560	-5751.490	-0.037558	
	(567.626)	(3280.46)	(0.00588)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	0.037127			
	(0.04528)			
D(EXR)	2.46E-05			
	(9.3E-05)			
D(INT)	-2.65E-05			
	(1.8E-05)			
D(MS)	7.266282			
	(2.15020)			
2 Cointegrating Equation(s):		Log likelihood	-911.2414	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	0.000000	-5738.768	-0.035902	
		(2523.11)	(0.00453)	
0.000000	1.000000	-0.018844	-2.45E-06	
		(1.22848)	(2.2E-06)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.190067	525.5751		
	(0.12746)	(267.320)		
D(EXR)	0.000360	-0.721560		
	(0.00027)	(0.57612)		
D(INT)	5.14E-05	-0.189484		
	(5.4E-05)	(0.11271)		
D(MS)	15.95833	-14242.72		
	(6.28271)	(13176.9)		
3 Cointegrating Equation(s):		Log likelihood	-905.4005	
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	EXR	INT	MS	
1.000000	0.000000	0.000000	-0.038863	
			(0.00627)	
0.000000	1.000000	0.000000	-2.46E-06	
			(2.1E-06)	

0.000000	0.000000	1.000000	-5.16E-07	
			(7.2E-07)	
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.192796	578.3530	-61.57341	
	(0.11094)	(233.826)	(809.337)	
D(EXR)	0.000361	-0.743823	-1.568708	
	(0.00027)	(0.57632)	(1.99479)	
D(INT)	5.03E-05	-0.167974	-0.757284	
	(4.7E-05)	(0.09962)	(0.34482)	
D(MS)	15.90580	-13226.75	-113304.2	
	(6.16580)	(12995.7)	(44981.8)	

Appendix V: Error Correction Mechanism Over Perametarized Error Correction Model

Dependent Variable: D(GDP)				
Method: Least Squares				
Date: 11/20/15 Time: 13:35				
Sample (adjusted): 1984 2013				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5081.231	3375.687	1.505244	0.1562
D(GDP(-1))	0.291013	0.159984	1.819012	0.0920
D(GDP(-2))	0.160906	0.156953	1.025183	0.3240
D(GDP(-3))	-0.022396	0.057478	-0.389645	0.7031
D(EXR)	-215.6392	161.5089	-1.335154	0.2047
D(EXR(-1))	93.71437	143.7421	0.651962	0.5258
D(EXR(-2))	209.3219	146.8956	1.424970	0.1777
D(EXR(-3))	607.3558	149.6099	4.059597	0.0014
D(INT)	963.8993	763.2428	1.262900	0.2288
D(INT(-1))	859.7926	721.2506	1.192086	0.2545
D(INT(-2))	133.9220	737.9455	0.181480	0.8588
D(INT(-3))	368.1114	702.1040	0.524297	0.6089
D(MS)	0.002642	0.004193	0.630120	0.5395
D(MS(-1))	0.004389	0.005225	0.840119	0.4160
D(MS(-2))	0.007086	0.005550	1.276774	0.2240
D(MS(-3))	0.002460	0.004881	0.503987	0.6227
ECM(-1)	-14345.79	25471.30	-0.563214	0.5829
R-squared	0.920173	Mean dependent var		25952.86
Adjusted R-squared	0.821924	S.D. dependent var		23390.11
S.E. of regression	9870.398	Akaike info criterion		21.52955
Sum squared resid	1.27E+09	Schwarz criterion		22.32357

Log likelihood	-305.9433	Hannan-Quinn criter.		21.78356
F-statistic	9.365752	Durbin-Watson stat		2.091661
Prob(F-statistic)	0.000109			

Appendix Vi: Over Perametarized Error Correction Model

Dependent Variable: DLOG(GDP)				
Method: Least Squares				
Date: 11/20/15 Time: 13:37				
Sample (adjusted): 1984 2013				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.062984	0.031091	2.025805	0.0638
DLOG(GDP(-1))	0.488849	0.224027	2.182098	0.0481
DLOG(GDP(-2))	-0.022460	0.180981	-0.124101	0.9031
DLOG(GDP(-3))	-0.006389	0.025764	-0.247975	0.8080
DLOG(EXR)	-0.058301	0.024548	-2.374936	0.0336
DLOG(EXR(-1))	0.012737	0.026001	0.489886	0.6324
DLOG(EXR(-2))	0.016130	0.025449	0.633822	0.5372
DLOG(EXR(-3))	0.040045	0.028755	1.392642	0.1871
DLOG(INT)	0.038129	0.045300	0.841707	0.4152
DLOG(INT(-1))	0.002821	0.045059	0.062617	0.9510
DLOG(INT(-2))	-0.053054	0.043603	-1.216746	0.2453
DLOG(INT(-3))	0.007466	0.040074	0.186312	0.8551
DLOG(MS)	-0.028920	0.075172	-0.384720	0.7067
DLOG(MS(-1))	-0.067870	0.084352	-0.804599	0.4355
DLOG(MS(-2))	0.088639	0.089662	0.988590	0.3409
DLOG(MS(-3))	-0.133986	0.084373	-1.588022	0.1363
ECM(-1)	-0.071922	0.065516	-1.097781	0.2922
R-squared	0.708340	Mean dependent var		0.054923
Adjusted R-squared	0.349374	S.D. dependent var		0.043844
S.E. of regression	0.035365	Akaike info criterion		-3.549086
Sum squared resid	0.016259	Schwarz criterion		-2.755074
Log likelihood	70.23629	Hannan-Quinn criter.		-3.295075
F-statistic	1.973278	Durbin-Watson stat		2.022783
Prob(F-statistic)	0.111021			

Appendix Vii: Parsimonious Error Correction Model

Dependent Variable: DLOG(GDP)		

Method: Least Squares				
Date: 11/20/15 Time: 13:40				
Sample (adjusted): 1984 2013				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026890	0.021675	1.240599	0.2299
DLOG(GDP(-1))	0.435490	0.204912	2.125252	0.0469
DLOG(GDP(-2))	0.019003	0.169400	0.112179	0.9119
DLOG(GDP(-3))	0.005171	0.024833	0.208214	0.8373
DLOG(EXR(-2))	0.013959	0.023532	0.593214	0.5600
DLOG(EXR(-3))	0.058369	0.024887	2.345363	0.0300
DLOG(INT(-2))	-0.066068	0.037064	-1.782519	0.0907
DLOG(INT(-3))	-0.009868	0.037930	-0.260174	0.7975
DLOG(MS(-2))	0.048143	0.077930	0.617773	0.5441
DLOG(MS(-3))	-0.081706	0.078582	-1.039747	0.3115
ECM(-1)	-0.028566	0.060434	-0.472678	0.6418
R-squared	0.530956	Mean dependent var		0.054923
Adjusted R-squared	0.284090	S.D. dependent var		0.043844
S.E. of regression	0.037097	Akaike info criterion		-3.473977
Sum squared resid	0.026148	Schwarz criterion		-2.960205
Log likelihood	63.10966	Hannan-Quinn criter.		-3.309617
F-statistic	2.150790	Durbin-Watson stat		1.938506
Prob(F-statistic)	0.072399			

Table 4.1:-Nigeria's Data on GDP, EXR, INT and MS

YEAR	GDP(₦ million)	EXR(**₦ /$**)	INT	MS(₦ million)
1980	31546.08	0.540000	6	15100.00
1981	205222.1	0.610000	6	16161.70
1982	199685.2	0.670000	8	18093.60
1983	185598.1	0.720000	8	20879.10
1984	183563.0	0.760000	10	23370.00
1985	201036.3	0.890000	10	26277.60
1986	205971.4	2.020000	10	27389.80
1987	204804.5	4.020000	12.75	33667.40
1988	219875.6	4.540000	12.75	45446.90
1989	236729.6	7.390000	18.5	47055.00
1990	267550.0	8.010000	18.5	68662.50
1991	265379.1	9.910000	14.5	87499.80
1992	271365.5	17.30000	17.5	129085.5
1993	274833.3	22.05000	26	198479.2
1994	275450.6	21.89000	13.5	266944.9

1995	281407.4	21.89000	13.5	318763.5
1996	293745.4	21.89000	13.5	370333.5
1997	302022.5	21.89000	13.5	429731.3
1998	310890.0	21.89000	14.3	525637.8
1999	312183.5	102.1100	18	699733.7
2000	329178.7	102.1100	13.5	1036080.
2001	356994.3	112.9400	14.3	1315869.
2002	433203.5	126.8800	19	1599495.
2003	477533.0	137.2200	15.8	1985192.
2004	527576.0	133.5000	15	2263588.
2005	561931.4	132.1500	13	2814846.
2006	595821.6	128.6500	12.3	4027902.
2007	634251.1	125.8300	10	5832488.
2008	672202.6	126.4800	9.8	9208463.
2009	718977.3	149.9000	7.4	10780627
2010	776332.2	150.4800	6.1	11525530
2011	834161.9	158.2100	9.2	13303494
2012	902794.0	159.3900	12	15483848
2013	964184.0	161.5000	12	16536750

Source: *CBN Statistical Bulletin (Various Issues)*
***Note**: GDP = Gross Domestic Product,EXR= Exchange Rate, INT= Interest Rate and MS= Money Supply.*