NEAR EAST UNIVERSITY

SCHOOL OF SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

M.sc ECONOMICS

MASTER'S THESIS

THE IMPACT OF MONETARY POLICY STABILIZATION ON ECONOMIC GROWTH: A CASE STUDY OF NIGERIA (1981 – 2013)

BY

ABDULLAHI YAKUBU ALI

STUDENT No. 20135866

THESIS SUPERVISOR

ASSIST. PROFESSOR ERDAL GURYAY

IN ACCORDANCE WITH THE REGULATION OF THE GRADUATE SCHOOL OF SOCIAL SCIENCES

NICOSIA, 2016.

DECLARATION

I do hereby declare that this Research Thesis titled "The Impact of Monetary Policy Stabilization on Economic Growth: A Case Study of Nigeria (1981 – 2013)" is submitted to the Department of Economics, Graduate School of Social Sciences, Near East University (TRCN) is a record of original work done by me. The information and data given in the Research Thesis is authentic to the best of my knowledge.

This Research Thesis is not submitted to any other University or Institution for the award of any degree or fellowship or published any time before.

ABDULLAHI YAKUBU ALI
Student No. 20135866

ASSOC. PROF. ERDAL GURYAY
SUPERVISOR _____ SIGN & DATE

PROF. DR. OKAN SAFAKLI
JURY MEMBER _____ SIGN & DATE

ASSIST. PROF. DR. TURGUT TURSOY
JURY MEMBER _____ SIGN & DATE

ABSTRACT

This study analyzed the impact of stabilized monetary policy on economic growth of Nigeria from 1981 – 2013. Utilizing a period arrangement information the study utilized Augmented Dickey-Fuller (ADF) test and Philip Perron (PP) Unit Root Test, Johansen Co-integration Test and Vector Error Correction Model (VECM) strategies in the investigation of the information gathered. The exact discoveries strikingly demonstrate that our variables were stationary after the first contrast change in (ADF) and (PP) Unit Root test. The Johansen Co-integration test result demonstrates that our variables are co-integrated. In the long run model, MS2, CPS, RINT and REER have a positive long run relationship with GDP. Additionally, it is clear to express that our model have no serial relationship and heteroskedasticity in the residual model.

Hypothetically, the study can derive that monetary policy variables have contributed fundamentally to the positive economic growth of Nigeria. In this manner, the study recommends the requirement for a suitable settled monetary policy approach through focusing on inflation rate. Decisively, the Central Bank of Nigeria ought to utilize direct regulation on financing cost been that high loan fee go about as a hindrance to improvement and national development.

Key words: Economic Growth, Money Supply (M2), Credit to Private Sector (CPS), Rediscounted interest Rate (RINT) and Real Effective Exchange Rate (REER)

ÖZET

Bir dönem düzenleme çalışması Genişletilmiş Dickey-Fuller (ADF) kullanılan bilgi testi ve Philip Perron (PP) Birim Kök Testi, Johansen Eş-bütünleşme testi kullanmak 2013 - Bu çalışma 1981 Nijerya ekonomik büyüme stabilize para politikasının etkisini analiz ve bilgi soruşturmasında Vektör Hata Düzeltme Modeli (VECM) stratejileri toplandı. Kesin keşifler çarpıcı bizim değişkenler ilk (ADF) kontrast değişim ve (PP) Birim Kök testinden sonra durağan olduğunu göstermektedir. Johansen Eş-bütünleşme testi sonucu, bizim değişkenleri ortak entegre olduğunu göstermektedir. Uzun vadede modelinde, MS2, CPS, RINT ve REER GDP ile pozitif uzun dönemli bir ilişki vardır. Ayrıca, bizim modelin artık modelde hiçbir seri ilişkisi ve Varyans sahip olduğunu ifade açıktır.

Varsayımsal çalışma para politikası değişkenleri Nijerya pozitif ekonomik büyüme temelde katkıda bulunduğunu elde edebilirsiniz. Bu şekilde, çalışma enflasyon oranının üzerinde duruluyor yoluyla uygun yerleşmiş para politikası yaklaşımı gereksinimini önerir. Kararlılıkla, Nijerya Merkez Bankası yüksek kredi ücreti iyileştirme ve ulusal kalkınmaya bir engel olarak gitmek edilmiş finansman maliyeti üzerinde doğrudan bir düzenleme kullanmak gerekirdi.

Anahtar Kelimeler: Ekonomik Büyüme, Para Arzı (M2) Özel Sektör (CPS) için, Kredi, iskonto faiz oranı (RİNT) ve Reel Efektif Döviz Kuru (REER)

FOREWORD

I hereby dedicate this Research Thesis to Almighty Allah (SAW), the most gracious, the most beneficent, and the most merciful for giving me good health, inspiration, knowledge and understanding, ability to achieve my aims and objectives.

I also want to use this medium to appreciate my entire family and friends for the extraordinary moral support, motivation, inspiration and prayers, May Almighty Allah return the favor to you all in abundance.

TABLE OF CONTENTS

CHAPTER 3

ADMINISTRATION OF MONETARY POLICY IN NIGERIA

CHAPTER 4

RESEARCH METHODOLOGY, SOURCES OF DATA AND VARIABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

OMO	OPEN MARKET OPERATION
CBN	CENTRAL BANK OF NIGERIA
CPI	CONSUMER PRICE INDEX
GDP	GROSS DOMESTIC PRODUCT
VAR	VECTOR AUTOREGRESSION
VECM	VECTOR ERROR CORRECTION MODEL
OLS	ORDINARY LEAST SQUARE
NTB	NIGERIAN TREASURY BILLS
MRR	MINIMUM REDISCOUNTED RATE
MS2	MONEY SUPPLY
CPS	CREDIT TO PRIVATE SECTORS
RINT	REDISCOUNTED INTEREST RATE
REER	REAL EFFECTIVE EXCHANGE RATE
ECT	ERROR CORRECTION TERMS
BLUE	BEST LINEAR UNBIASED ESTIMATE
SAP	STRUCTURAL ADJUSTMENT PROGRAM
ADF	AUGMENTED DICKEY-FULLER
PP	PHILIP PERRON
ARCH	AUTOREGRESSIVE CONDITIONAL HETEROSKEDASTICITY

CHAPTER 1

INTRODUCTION

The term monetary policy is essentially one of the major viable measures utilized by nations all around the world, it can be expounded as the strategy by which a Nation's Central bank or financial collections of a state controls the supply of cash, availability of cash, and cost of cash or rate of premium, critically to achieve an arrangement of objectives worried with to the advancement and dauntlessness of an economy. Monetary approach facilitates on the association between the rates of enthusiasm of an economy, which infers that the cost which cash can be allotted and the aggregate inventory network in pivot. Monetary strategy schedules scopes of riggings to control these emergencies in other to influence the conceivable results like fast bring up in the economy of government, decrease in swelling rate, consistent trade rates with different monetary forms and enhanced job rate.

Monetary policy is a satisfactory world standard full scale financial measure, however the way and methodology of applying this strategy matters a lot to the structure of a country monetary development. It is accepted that a stable monetary arrangement requires a potential financial development of a state, this examination proposition is for the most part centered on stable monetary approach, and how it enhances the Nigerian economy in general.

1.1 BACKGROUND OF THE STUDY

The significant goal of monetary policy strategy in cutting edge years is known for its fast financial development of an economy. Different points, for example, full livelihood, value soundness which likewise incorporate controlling financial insecurities and maintaining equalization of installments balance are additionally anticipating.

Economic development could be characterized as the consequent ascent in the measure of products and administrations in a given nation at a particular time. This obviously demonstrates when the genuine per capita wage of a nation ascends after some time, the economy is developing. A creating economy produces merchandise and administrations in each succeeding time period, seeing that the economy's gainful capacity is at an expanding pace. Extensively

economic development suggests raising the way of life of the general population and diminishing imbalances of wage appropriation (Jhingan 2004).

In Nigeria, monetary policy is fundamentally one of the real apparatuses utilized by Central Bank of Nigeria in her push to support economic development by stalking the command of value strength and little stable inflation. Additionally, Fiscal approach that contains the utilization of charges, open use among others is another significant instrument for enhancing the monetary advancement in Nigeria; obviously this is not the consideration of this examination. Monetary approach has been utilized from the time when the Central bank of Nigeria was burdened on the obligation of confining and executing monetary policy strategy by Central Bank Act of 1958. This have apparently supported the advancement of energetic currency flea market where treasury bills, budgetary mechanical assembly are utilized for open market operations and obligation for government has skyrocket in volume and worth's turning into a proper getting advantage for representatives and premise of coordinating liquidity in the business sector. There has been a few governments' organization of monetary policy strategies in Nigeria for some time, financial strategy is said to be contracted and in other condition, for the most part castoff to unfaltering costs. The Nigerian economy has seen periods of broadening and shrinkage yet plainly, the supposed development has not been feasible as there is substantiation of upward destitution among the people in the Nation.

These instruments for fulfilling the reasons of monetary policy approach in Nigeria have changed. Two noteworthy periods have depicted monetary policy in Nigeria i.e. the post and pre 1986 period. Before 1986, straight fiscal control was utilized as a part of achieving value soundness in Nigeria. While the weight moved towards market systems after the 1986 business sector liberalization, this open market operations (OMO) was the principle instrument of the business sector based structure (Uchendu 2009).

Preceding 1986 straight monetary policy instruments, for example, specific credit controls, controlled financing cost and trade rates, credit roofs, money hold prerequisites and uncommon stores to battle expansion and monitor value security were locked in. The setting of loan fees at a similarly short state was for the most part to help speculation and improvement in the economy. Discontinuously, unique credits were implemented to decrease the total of surplus holds and credit, making volume of the banks (Uchendu 2009 and Okafor 2009).

Nigerian economy's standard has been tormented with various experiences for so long. Despite innumerable and reoccurring changes on financial, money related and other full scale monetary strategies, Nigeria has not remained to obfuscate her monetary skills for quick monetary improvement. Henceforth, the contention on the adequacy of monetary approach as a gadget for redesigning and improvement stays unsuitable, given the conflicting aftereffects of present studies (Adeoye, 2006).

The Nigerian monetary policy approach is developed on medium term discernment system in the late year. The change was to allow money related strategy application from misconduct of stretch anomaly and abatement over reaction appropriately to brief shocks. Approaches have extended from pointing financial totals to watching and affecting arrangement rates to control the interbank rates and by deferment, other business sector rates in the wanted heading (Okoro 2005 and Uchendu 2009).

In 2009, the expansionary monetary policy strategy by the CBN brought about base cash surpassing the demonstrative benchmark of the Central Bank of Nigeria. Really as at this date swelling focusing on and loan cost control among different arrangements are longing for sufficient thought by CBN as approaches to have a snugger hold on monetary policy strategy application in Nigeria.

Taking into account the above studies, the financial instrument structure appears to have been unsuccessful in achieving the set money related destinations, as their application turns out to be less successful in this present state. This study seeks after to exactly build up the impact of chose balanced out monetary approach instruments, for example, money supply, rediscounted interest rate, and exchange rate, to distinctively help the economic development of Nigeria. The entirely composed loan fee organization and unimportant relationship of monetary and fiscal approaches may have contributed gigantically to the unfriendly impact of restricting progression of cash and capital markets.

The point of this exploration study is to quantify the effect of balanced out money related arrangement in Nigeria. Expressly, on the off chance that it facilitate development generally and examine the result of different variables in passing on the expected reasonable monetary advancement in Nigeria. For this tirelessness reason, this examination project would be ordered

into five chapters. Chapter one is presentation, foundation of study, destinations, research speculation and extent of the study. Chapter two is fundamentally on hypothetical structure, writing audit and monetary arrangement organization in general. Chapter three is the exploration technique, Chapter four talks about the aftereffect of experimental findings; lastly Chapter five condenses the undertaking, conclusion and suggestion.

1.2 RESEARCH OBJECTIVE

The real point of the examination work is to know whether settled financial arrangement has a judicious positive effect on the monetary development of Nigeria. Different goals of this examination work are as per the following:

A. To survey the part of monetary policy approach on economic advancement of Nigeria.

B. To comprehend the quantity of components deciding the part of monetary policy approach and reasonable impact on the economic development of the Nation.

C. To explore which variables tunes in the economic development of Nigeria successfully.

1.3 RESEARCH HYPOTHESIS

The examination theory help in testing for the importance of this exploration contemplate; this study depends on the money related approach instrument as for the economic advancement of Nigeria, utilizing Null and Alternative speculation testing strategy.

Null Hypothesis H_0: Stabilized monetary policy instrument has no significant impact on Economic execution of Nigeria.

Alternative Hypothesis H_1: Stabilized monetary policy instrument significantly impacts on Economic execution of Nigeria.

1.4 SIGNIFICANCE OF RESEARCH STUDY

The study gives knowledge about part of a stabilized monetary policy and its impact on Nigerian economy. It will encourage the administration in choice making and advances financial condition, safe environment for business improvement and guaranteeing that the administration activities are predictable with monetary strength. It would be of crucial unmistakable quality to money related organizations in stentorian of large scale financial commitments of wherever they work. This exploration undertaking suggests very much outfitted means in which the supervisory bodies can grasp financing costs and other monetary policy strategy instruments to achieve the favored objectives. To be sure, scientists and understudy who are included on this topic will discover this exploration extend extremely advantageous. In any case, it supplements the past winning writing.

As a last point, the unfilled prospective project in this exploration undertaking will bolster the Central Bank of Nigeria (CBN) as the boss executive of the budgetary framework in ringing out its obligations going for suitable usage of full scale monetary commitments.

1.5 SCOPE AND LIMITATION OF THE STUDY

This study will utilize 1981-2013 information to investigate how monetary policy variables impact on the economic advancement of Nigeria. Money supply is primary researched subject in the contemporary time, since it has stern ramifications for monetary advancement and pay dissemination. In Nigeria, unnecessary cash stream is the center reason reprehensible for expansion. These study focuses on monetary policy approaches which apparently have a straight association with cost increments, whether the arrangement is cozy or lose; it eats up an impact some mode. Extra, Monetary instruments influence the entire movement in an economy. Thusly the study would decide how GDP in Nigeria would retort to adjustment to monetary instruments in the economy.

CHAPTER 2

LITERATURE REVIEW ON MONETARY POLICY

2.1 EMPIRICAL LITERATURE

Originally, monetary policy was embedded from the research work of Irving fisher who laid the groundwork of the quantity theory of money over and done with his equation of exchange. Under strict observation on his scheme, money had no consequence on economic totals except price value only. Nevertheless, the starring role of liquid cash in an organization has been explicitly interpreted by Keynes in 1930. Cambridge economists additionally hypothesized that liquid money has unanticipated disaster on supplementary monetary instruments by affecting rate of premium which shakes business opportunities and cash allotment of productive delegates. From the conclusion of Keynes, unemployment rises from inadequate summative interest which can be opened up by upsurge in cash supply, which breeds increment in spending, increment in job and development standard. Nevertheless, he proposed an appropriate blend of monetary and fiscal approaches as a crossroads; monetary strategy might maybe slump to achieve its goal. The reason for monetary strategy, which is succession to convincing the volume, expense and way of money supply is practically nattered by (Friedman, 1968. P. 1-17), who evidently expressed that increment in cost, is a monetary event in spite of the fact that perceiving in the short run acceleration in cash supply can radically shrivel joblessness yet consequently give space to upsurge cost level. Therefore monetary consultants should be more objective in circulation of money.

Based on the interpretation directly above, it lays prominence on fluctuations in monetary policy which is heartrending the output via interest rate, exchange rate and supplementary asset values comprising of bonds, stock market and real estate values, which are deprived of clear allusion to credit strait. The secondly, markets are said to be perfect when the sight of money is implied. Debtors are considered homogenous from the outlook fact of the financiers. Therefore, financial organizations cannot differentiate between the appraisals of dissimilar insolvents. Henceforth, price value is the only element to perfect the flea market or equilibrate the market.

Subsequently, the occurrence of endogenous credit regulation is lined out by the second assumption (Bernanke and Blinder, 1988).

Ahmad and Mortaza (2005) established a concept that restrained and horse barn inflation, in other to promote the evolution process of a country, and hence economic maturation. Using yearly data set on real GDP and Consumer Price Index of Bangladesh for the flow of 1980 to 2005, they unveil statistically noteworthy long-running negative relationship between inflation and economic growth for the country as indicated by a statistically significant long-run negative relationship between CPI and real GDP. Also as a threshold they suggested 6% of inflation above which rise in price unpleasantly affect economic evolution.

Ajayi (1974) underscored that in creating economy in which Nigeria is a run of the mill illustration, the accentuation is dependably on financial arrangement as opposed to money related strategy. In his work, he evaluated the variables of financial and financial arrangements utilizing conventional slightest square (OLS) method and figured out that money related impacts are much bigger and more unsurprising than monetary impacts. This outcome was affirmed with the utilization of beta coefficients that progressions in money related activity were more prominent than that of financial activity. Fundamentally, more prominent dependence ought to be set on monetary policy activities.

Terlumun (2004) examined the relationship between value unpredictability, desires and financial approach in Nigeria. The research connected the greatest probability estimator, and the summed up autoregressive restrictive heteroscedasticity (GARCH) model to evaluate the enduring model of expansion. The Gauss-Siedel calculation remained connected for progressive desires with genuine expansion arrangement as begin qualities. The research study discovered that swelling desire and value unpredictability is not just affected the coexistent expansion, it additionally brought about perseverance financing cost differential and money related development, therefore bargaining the goal of monetary strategy.

Nwafor et al. (2007) examined the soundness of money enthusiasm for Nigeria using vector autoregressive strategy. Their results insisted an enduring money premium limit for Nigeria. Akinlo (2006) using an autoregressive scattered slack (ARDL) technique merged with CUSUM

and CUSUMQ tests, examined the co-integrating property and consistent quality of M2 enthusiasm for Nigeria. The results show M2 to be co-integrated with pay, credit cost and change scale. The CUSUM test weakly reported a consistent money enthusiasm for Nigeria.

Omotor (2009) additional connected the ARDL system and pretty much as found an unfaltering money enthusiasm for Nigeria. Additionally, in another study on financial procedure in Nigeria, Omotor (2010) surveyed an endogenous auxiliary break point. Using the Gregory and Hansen procedure, an endogenous break point of 1994 was evaluated for the co-integrating scientific explanation of the enthusiasm for money. The research study verified an unfaltering money premium limit for Nigeria and contemplated that the Central Bank of Nigeria (CBN) has reasonably used money supply as cash related procedure instrument.

Raymond (2009, 18) exactly analyzed the long run and short run relationship between macroeconomic elements in particular: money supply (M2, M3), loan cost, and swapping scale and expansion rate and stock value (JSE file) in Jamaica. By utilizing time arrangement investigation Vector Error Correction Model (VECM) and Johansen co-coordination, utilized month to month time period information from January 1997 to December 2007. The outcomes demonstrate that the long run relationship between macroeconomic variables and JSE list, likewise show that its absolutely affected among JSE list and swelling rate, cash supply (M3) and contrarily by conversion scale financing cost and cash supply (M2). Further, the outcome demonstrates that short run relationship, between JSE record and macroeconomic components are financing cost and cash supply (M2, M3). Additionally show that the stuns for all components influenced on stock cost by applying drive reaction technique.

Kuttner and Mosser (2002) indicated that monetary policy affect the economy through several transmitting mechanisms such as the interest rate epithelial duct, the exchange rate channel, Tobin's q theory of wealth effect, the monetarist channel, and the credit channels including the bank offering channel and the balance-sheet channel. But mainly monetary policy swordplay its part in regulating rise in price through money supply and interest rate. Money Supply (M2) would affect real GDP positively since an increment in real amount of money causes the nominal interest rate to decline and real output to rise (Hsing, 2005).

Hsing (2005) examined an annual sample during 1959-2001 to find possible relationships between real GDP and selected macroeconomics variables. According to his study more real M2, more government deficit spending, real depreciation, a higher expected inflation rate and higher world oil price would help raise real GDP in Venezuela.

Qayyum (2006) investigated the linkage between the excess money supply and inflation in Pakistan, his result from the correlation analysis indicates that there is a positive relationship between money growth and inflation. The money supply growth at first-round affects real GDP growth and at the second round affects inflation in Pakistan.

Mehrara et. al (2010) examined the dynamic causal relationships among money, GDP and prices for Iran using annual data over the period 1960-2008. Here, they used Gregory-Hansen co-integration technique, allowing for the presence of potential structural breaks in data to empirically examine the long-run co- movement between the variables. The results suggested the presence of a long-run relationship between these variables.

Mohamad pour et. al (2012) unveil the relationships between monetary policy and GDP in Malaysia for quarterly data from 1991 to 2011. Here, the co-integration analysis and Vector Error Correction Models (VECM) were indicated a possibility of long-run equilibrium relationship between real GDP regards to M1, M2, M3, and real interest rate. However, results of trace and maximum Eigenvalue methods suggested two co-integration equations among the variables. Altogether, VECM analysis indicates monetary supply variables included in the model (M1, M2, and M3) are statistically significant and have long-term influence on GDP. Findings of this study suggested increasing money supply would eventually increase the real GDP in Malaysian economy.

Daniela and Mihali (2010) analyzed the relationship between money supply and gross domestic product for Romania. Analyzing the data of money supply (M3) and of GDP over ten years through the Augmented Dickey-Fuller they obtained that both series are non-stationary. Applying the co-integration analysis method it is concluded that the two series have a co-integration relationship between them and moving together in the long run.

Nenovsky and Hristov (1999) then focus on the second step of transmission and study the link between the monetary and the real sector variables include different monetary aggregates, consumer prices, exchange rate, interest rates, and real variables (industrial sales index and retail sales index). The statistical techniques used include univariate analysis, correlation analysis, and unstructured VAR with impulse response and variance decomposition analysis. The authors find that the discretionary central bank regime (pre-1997) is associated with a strong negative relationship between monetary and real variables, which turns positive (albeit remaining small) under a currency board (post-1997).

Feridun (2005), studied impact of monetary policy on economic instability in Turkey from 1983 – 2003 and based on quarterly data, the study affirmed that the efforts of the Turkey monetary policy at influencing the finance of government fiscal deficit through the determination of the inflation- tax rate, affected to some extent, the rate of inflation and the real exchange rate thereby causing volatility in their rate.

Genev (2002), utilizing a basic vector autoregression (SVAR) methodology, concentrated on the impact of money related stuns in ten central and eastern European nations, discovered a few signs that adjustments in swapping scale influence output yield.

Starr (2005), utilizing SVAR model with orthogonaised identification discovered minimal confirmation of genuine impacts of monetary strategy in five regions of Free State (CIS) with prominent special case that adjustments in financing cost significantly affect output yield.

Sohail and Zakir (2010, 181), this study explored both the short run and long run effect of five macroeconomic factors on GDP. Using Johansen co-integration technique and VECM model. This study used monthly data from Nov 1991 to Jun 2008. The study revealed a positive impact of consumer price index and the real effective exchange rate. Contrary, the issue of money (money supply) and the quarterly treasury bills rates had a negative effect in the long run. The VECM revealed that it spent more than eight months to eliminate the disequilibrium. The variance decompositions showed that consumer price index and money supply had greater

forecast error than the industrial production index, the three month treasury bills rate and the real effective exchange rate for the General Index.

Shahbaz, Shamim and Aamir (2010, 103), the study sought the interactions among Pakistan's economic growth performance and macroeconomic factors using both the Fully Modified Ordinary Least Square (FMOLS) method to test for co-integration in the long-run and the Error Correction method to test for the existence of a short run relation. Before further analysis, the stationary of the series were defined using Ng-Perron unit root test. Findings reveal that a rise in both government spending and foreign remittances increased the performance of economic growth. Moreover trade openness associated with capital inflows opened new opportunities to improve the development of the Pakistani financial markets. On the contrarily, appreciation in inflation rates and the high savings rate decreased the efficiency in the overall economic growth performance.

Chaudhry et al (2012) analyze that there is long-run and short run relationship of monetary policy and economic growth in Pakistan by using co-integration and causality analyses during the period of 1972-2010. The findings shows that credit to private sector the variable of financial depth, real exchange rate are found significantly influencing GDP in Pakistan. The analyses of monetary policy in Pakistan show that actual growth remained higher than target rate of money growth set by the SBP. Moreover money expansion has an inflationary impact on the economy of Pakistan.

Akpansung and Babalola (2011), find significant long-run relationship between private sector bank credits and economic growth in Nigeria. The causality results indicate that a unidirectional causality runs from GDP to private sector bank credits and also, from industrial production to GDP. Lending rates are found to impede economic growth. The study recommends increased bank credits to the private sector at reduced interest rate in order to accelerate Nigeria's economic growth.

Amassoma et al. (2011) examined the monetary policy variables and GDP. He conducted study in Nigeria from 1986-2009. He found using Least Squared method that there is significant

relationship among monetary policy exchange rate and money supply. He found that monetary policy had reasonable effect on money supply and exchange rate. He also stated that there is insignificant relationship between monetary policy and instability of price.

Onyeiwu (2012) analyzed the impact of monetary policy in Nigeria. He used Ordinary Least Squares Techniques to identify the impact by using the data from 1981-2008. His findings show that there is positive impact of monetary policy variables on GDP. He also found that there is negative impact of monetary policy on inflation rate. Moreover his study shows significant impact of monetary policy on real economic growth.

Rafiq and Mallick (2008) examined the effects of monetary policy on output in the three largest euro area economies (Germany, France and Italy) using the new VAR identification procedure. Quarterly observations from 1981- 2005 were used. Results suggest that monetary policy innovations are at their most potent only in Germany. Apart from Germany, it remains ambiguous as to whether a rise in interest rates concludes with a fall in output, thereby showing a lack of homogeneity in the responses.

Obamuyi and Olorunfemi (2011) examined the implications of financial reform and interest rate behavior on the economic growth in Nigeria. Study results revealed that financial reform and interest rates have significant impact on economic growth in Nigeria; also, results implied that the interest rate behavior is important for economic growth.

The study of Berument and Dincer (2008) measured the effects of monetary policy for Turkey through structural VAR (SVAR) technique covering the period 1986-2000. Empirical results show that a tight monetary policy has a temporary effect on output, causing output to decline for three months in a statistically significant fashion. The findings confirm the work of previous studies (Sousa and Zaghini, 2008; Sims, 1992; Eichenbaum and Evans, 1995).

Hoffman (2001), studied the relationship between monetary policy variable (credit to private sector, inflation rate and interest rate) and GDP through a co-integrating VAR for 16

industrialized countries, his findings indicates a significant positive relations of credit to real GDP , and a negative correlation with real interest rates.

Calza, et. al. (2001), using VECM for the euro area data, model the factors that affect the demand for credit and find that in the long run, the latter are positively related to real GDP growth and negatively to short term and long term real interest rates.

Bhuiyan (2008) used the VAR (SVAR) to examine the effects of monetary policy shock in Canada by using the overnight target rate as the monetary policy instrument. Using monthly data from 1994-2007, findings of the study indicate that the transmission of the monetary policy shock to real output operates through both the interest rate and the exchange rate Using money supply as a measure of monetary policy.

Nouri and Samimi (2011) examined the impact of monetary policy on economic growth in Iran adopting ordinary least squares (OLS) technique and data covering the period 1974- 2008. A positive and significance relationship between money supply and economic was established in the study.

Akpansung and Babalola (2011) find significant long-run relationship between private sector bank credits and economic growth in Nigeria. The causality results indicate that a unidirectional causality runs from GDP to private sector bank credits and also, from industrial production to GDP. Lending rates are found to impede economic growth. The study recommends increased bank credits to the private sector at reduced interest rate in order to accelerate Nigeria's economic growth.

Fasanya, Onakoya and Agboluaje (2013) examined the impact of monetary policy on economic growth using time series data covering the period 1975-2010.The effects of stochastic shocks of each of the endogenous variables were explored using Error Correction Model (ECM). Findings of the study reveal a long run relationship among the variables. Also, the core finding of the study shows that inflation rate, exchange rate and external reserve are significant monetary policy instruments that drive growth in Nigeria.

Literature is inconclusive regarding the impact of monetary policy on economic growth. Whereas Keynesians argue that monetary policy is ineffective in impacting on economic growth, Monetarists are of the view that changes in monetary policy will impact economic growth.

Actually, a stabilized monetary policy makes efforts to attain a set of intents that are articulated in expressions of macro-economic capricious, such as money supply, inflation, real output and unemployment. Prior researches have come up with different approaches on the likelihood of expressing the possibility of monetary procedure power on economic development of a Nation. For some period over time, the progressive impression of monetary strategy has bred huge research paper on both theoretical and empirical literature. Though, supreme volume of the studies remunerates further courtesy to advanced country and inclusion of emergent countries in case of fractious country studies were predominantly to produce adequate degrees of freedom in the path of statistical analysis. Various studies give different results due to differences in country(s) of study, time period and methodology used.

Table 2.1.1: Summary of Empirical Review.

Study	**Methods**	**Variables**	**Results**	**Countries**
Ahmed and Mortaza (2005)	Co-integration, VECM	Real GDP, Consumer Price Index	The results indicates that they is a long run negative relationship between inflation and Real GDP	Bangladesh
Nwafor et al. (2007)	VAR	Money supply M2, interest rate, GDP	The result indicate that monetary variables has a negative impact on GDP	Nigeria
Akinlo (2006)	(ARDL) technique merged with CUSUM and CUSUMQ tests	Money Supply M2, Credit Cost and GDP	The CUSUM test weakly reported a consistent money enthusiasm to GDP	Nigeria

Raymond, (2009)	Vector Error Correction Model (VECM), Johansen co-integration and impulse response procedure	Money supply (M2, M3), interest rate, exchange rate and inflation rate	The findings reveal that the long run relationship between macroeconomic factors and JSE index, also indicate that its positively influenced among JSE index and inflation rate, money supply (M3) and negatively by exchange rate interest rate and money supply (M2).	Jamaica
Hsing (2005)	OLS	M2, Government Deficit, Inflation rate and GDP	The results indicates a positive significant relationship between the macroeconomic variables and GDP	Venezuela
Qayyum (2006)	Correlation analysis	Money supply, Inflation rate, real GDP	The correlation analysis indicates that there is a positive relationship between money growth and inflation. The money supply growth at first-round affects real GDP growth and at the second round affects inflation	Pakistan
Mehrara et. al (2010)	Gregory-Hansen co-integration technique	Money supply, Inflation rate, real GDP	The results indicates the presence of a long-run relationship between these variables	Iran
Mohamad pour et. al (2012)	Co-integration analysis and Vector Error Correction	Real GDP, M1, M2, M3 and Interest rate	The co-integration result indicate 2 co-integrating equation, Vector Error Correction Models (VECM) indicates a possibility of	Malaysia

	Models (VECM)		long-run equilibrium relationship between real GDP regards to M1, M2, M3, and real interest rate. The findings of this study suggested that increasing money supply would eventually increase the GDP	
Daniela and Mihali (2010)	ADF and Co-integration	Money supply M3 and GDP	The ADF result indicates that both series are non-stationary at 1st difference; the co-integration analysis concluded that two series have a co-integrating relationship between them and moves together in the long run.	Romania
Nenovsky and Hristov (1999)	Univariate analysis, correlation analysis, unstructured VAR and variance decompositio n analysis	Monetary aggregates, consumer price index, exchange rate, interest rate and real sector variables	The results indicates that they was a strong negative relationship between monetary aggregates and real sector variable in the economy	Bulgaria
Starr (2005)	SVAR model	Money supply, interest rate, and GDP	The results indicates that money supply has a significant effect on GDP but interest rate has a negative significant on GDP	East European Nations
Sohail and Zakir (2010)	Johansen co-integration technique and VECM model	Consumer price index, real effective	The study revealed a positive impact of consumer price index and the real effective exchange rate and a negative effect of	Pakistan

		exchange rate, money supply and treasury bills	money supply and treasury bills in the long run	
Shahbaz, Shamim and Aamir (2010)	Ng-Perron Unit root,Fully Modified Ordinary Least Square (FMOLS), co-integration and Error Correction method	Government spending, foreign remittance, inflation rate, savings rate and GDP	The findings reveals that a rise in spending and foreign remittance increases the economic performance, while inflation rate and savings decreases the efficiency of economic growth	Pakistan
Chaudhry. et al (2012)	Co-integration analysis and Vector Error Correction Models (VECM)	Credit to private sector, exchange rate and GDP	The results shows that credit to private sector and exchange rate have a long run significant on GDP	Pakistan
Amassoma et al. (2011)	OLS Method	Money supply, exchange rate and GDP	The findings indicate that a monetary policy variable (money supply and exchange) has a significant effect on economic growth. He also stated that there is a insignificant relationship between monetary policy variables and instability of price.	Nigeria
Onyeiwu	OLS Method	Money	The results indicates a positive	Nigeria

(2012)		supply, liquidity ratio, minimum rediscounted rate, inflation and GDP	significant impact of monetary policy variables on GDP, Also there is a negative impact of inflation rate on GDP. However the study shows that monetary policy variables have a significant relationship on real economic growth.	
Rafiq and Mallick (2008)	VAR	Monetary policy Variables and GDP	The results suggest that monetary policy variables has a significant relationship on economic growth	Germany
Berument and Dincer (2008)	structural VAR (SVAR) technique	Monetary policy Variables and GDP	Empirical results show that a tight monetary policy has a temporary effect on output, causing output to decline for three months in a statistically significant fashion	Turkey
Fasanya, Onakoya and Agboluaje (2013)	Error Correction Model (ECM)	Exchange rate, inflation rate and external reserve	Findings of the study reveal a long run relationship among the variables. Also indicates that inflation rate, exchange rate and external reserve are significant monetary instrument that drives economic growth	Nigeria
Hoffman (2001), Calza, et.al (2001)	Co-integration, VAR, VECM	Credit to private sector, inflation rate, interest rate and	The findings indicate a significant long run relationship between credit and GDP. Also a negative short and long term real interest rate	16 industrialized countries

		GDP		
Akpansung and Babalola (2011)	Causality Test		The findings indicates a significant long-run relationship between private sector bank credits and economic growth in Nigeria	Nigeria
Obamuyi and Olorunfemi (2011)	ADF, Co-integration, VECM	Lending rate, deposit rate, Inflation and GDP	Study results revealed that financial reform and interest rates have significant impact on economic growth	Nigeria

2.2 THEORETICAL REVIEW

There are diverse transmission networks of monetary policy that addresses the progress of economic standardization. The relationship between economic growth and monetary policy has been examined in an existing related literature. Various theories have been developed to explain the association between economic growth and monetary policy variables. This literature review provides a discussion for the various theories that have analyzed monetary policy variables' effect on economic growth. There are various theories that have been developed to describe the relationship between monetary policy variables and economic growth. These theories comprises of: the quantity of money, liquidity preference theory of interest, money multiplier effect, exchange rate determination model and Hicksian IS – LM model.

2.2.1 THE QUANTITY THEORY OF MONEY

The framework depends on the quantity theory of money. Monetary target is anticipated on the exact confirmation that expansion is fundamentally a money related wonder and consequently, the financial powers must control the supply in other to control inflation. According to Friedman, (1976) the quantity theory of money is scientifically expressed as;

$$MV = PQ$$

Where,

M = Stock of Money

V = Velocity of Monetary Circulation

P = Price Level

Q = Real Aggregate Output (Income)

The link between the total quantity of money in circulation and the total spending in final goods and service produced in the economy, the rate of turnover of MV that is, the average number of times per year that a unit of the naira is spent on buying the total amount of economic products and facilities manufactured in a country. Focusing on ascend in cost in late monetary policy methodology whose essential thought is that the Central Bank embraces or appoints unequivocal numeric target range from inflation to making accomplishments of its essential goal.

It is vital to tolerate at the top of the priority list, this does not mean the Central Bank overlooks unemployment or the rate of monetary development. It essentially implies that the length of swelling stays inside of the expressed extent, the Central Bank is free (and in fact expected) to balance out the economy. Nevertheless, the basic doctrine of inflation targeting is the price stability, accountability, and discipline on the part of the Central Bank and the government itself (Osakwe, (1983), Adeyokumu, (1983) and Sanyo, 2000).

2.2.2 LIQUIDITY PREFERENCE THEORY OF INTEREST

Liquidity preference means the desire of the public to hold cash. According to Keynes (1936:199), there are three motives behind the desire of the public to hold liquid cash: (1) the transaction motive, (2) the precautionary motive, and (3) the speculative motive.

A. Transactions Motive

The transactions motive relates to the demand for money or the need of cash for the current transactions of individual and business exchanges. Individuals hold cash in order to bridge the gap between the receipt of income and its expenditure. This is called the income motive.

The businessmen also need to hold ready cash in order to meet their current needs like payments for raw materials, transport, wages etc. This is called the business motive.

B. Precautionary Motive

Precautionary motive for holding money refers to the desire to hold cash balances for unforeseen contingencies. Individuals hold some cash to provide for illness, accidents, unemployment and other unforeseen contingencies. Similarly, businessmen keep cash in reserve to tide over unfavorable conditions or to gain from unexpected deals.

Keynes holds that the transaction and precautionary motives are relatively interest inelastic, but are highly income elastic.

The amount of money held under these two motives (M_1) is a function (L_1) of the level of income (Y) and is expressed as:

$$M_1 = L_1 (Y)$$

C. Speculative Motive:

The speculative motive relates to the desire to hold one's resources in liquid form to take advantage of future changes in the rate of interest or bond prices. Bond prices and the rate of interest are inversely related to each other. If bond prices are expected to rise, i.e., the rate of interest is expected to fall, people will buy bonds to sell when the price later actually rises. If, however, bond prices are expected to fall, i.e., the rate of interest is expected to rise, people will sell bonds to avoid losses.

According to Keynes, the higher the rate of interest, the lower the speculative demand for money, and lower the rate of interest, the higher the speculative demand for money. Algebraically, Keynes expressed the speculative demand for money as:

$$M_2 = L_2 (r)$$

Where,

M_2 is the speculative demand for money, and

r is the rate of interest.

Geometrically, it is a smooth curve which slopes downward from left to right.

Now, if the total liquid money is denoted by M, the transactions plus precautionary motives by M_1 and the speculative motive by M_2, then

$$M = M_1 + M_2. \text{ Since } M_1 = L_1 (Y) \text{ and } M_2 = L_2 (r),$$

The total liquidity preference function is expressed as:

$$M = L (Y, r).$$

On the contrary, the Keynesian school postulates that transformation in cash stock actions in the monetary environment adjusts the rate of interest, increase employment, business opportunities and output of the economy (Johnson 1962, pp.354-357 and Uremadu 2005).

2.2.3 MONEY MULTIPLIER EFFECT

Money multiplier (also known as monetary multiplier) represents the maximum extent to which the money supply is affected by any change in the amount of deposits. It equals ratio of increase or decrease in money supply to the corresponding increase and decrease in deposits.

The money multiplier effect arises due to the phenomenon of credit creation. When a commercial bank receives an amount A, its total reserves are increased. The bank is required by the central bank to hold only an amount equal to $r \times A$ in hand to meet the demand for withdrawals, where r is the required reserve ratio. The bank is allowed to extend the excess reserves i.e. $(A - r \times A)$ as loans. When the borrower keeps the whole amount of loan in bank (it is assumed), it increases its total reserves by an amount equal to $(A - r \times A)$. Again, the bank is required to hold only a fraction of this second round of deposits and it can lend out the rest. This cycle continues such the ultimate increase in money supply due to an initial increase in checking deposits of amount A is equal to $m \times A$, where m is the money multiplier. The opposite happens in case of a decrease in deposits through the same mechanism.

Formula

$$\text{Money Multiplier} = \frac{1}{\text{Required Reserve Ratio}}$$

Required reserve ratio is the fraction of deposits which a bank is required to hold in hand. It can lend out an amount equals to excess reserves which equals (1 − required reserves).

Higher the required reserve ratio, lesser the excess reserves, lesser the banks can lend as loans, and lower the money multiplier. Lower the required reserve ratio, higher the excess reserves, more the banks can lend, and higher is the money multiplier (Courchene, Thomas. J. and Kelly Alex, K., 1971:239)

2.2.4 EXCHANGE RATE DETERMINATION MODEL

The monetary approach happens to be one of the oldest approaches to determine the exchange rate. It is also use as a yardstick to compare the other approaches to determine exchange rate. The monetary model assumes a simple demand for money curve. The purchasing power parity or the law of one price holds true. The monetary model also assumes a vertical aggregate supply curve. A vertical aggregate supply curve does not imply constancy in the output but a flexible price.

According to the absolute purchasing power parity the exchange rate is obtained by dividing the price level of the home country with that of the foreign country. I.e.

$$P = eP^*$$

Where P is the domestic price level, P* is the foreign price level and e is the exchange rate.

The demand for money equation is given by:

$$Md = kPy$$

Where k is the constant and y is the real income level.

In equilibrium, $Md = Ms$

Hence at the point of intersection of the aggregate demand and aggregate supply curve,

$$Kpy = Ms$$

$$Or, P = Ms / Ky$$

$$Or, eP^* = P = Ms / Ky$$

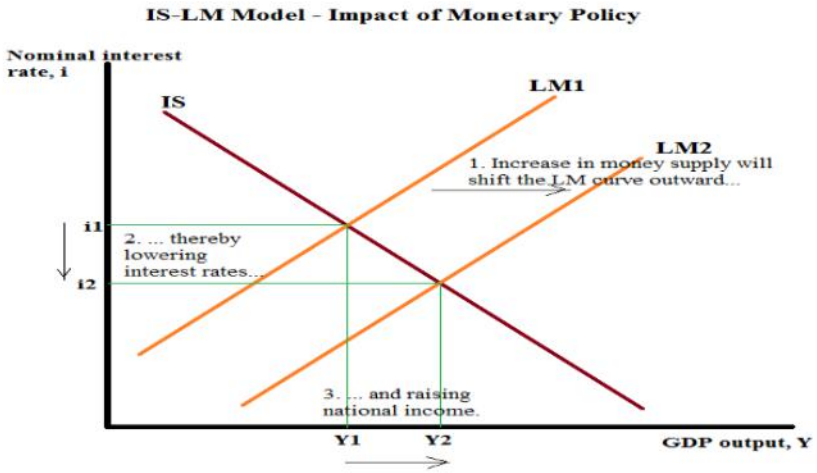
$$Or, e = Ms / P.ky$$

At this point external equilibrium is obtained in the economy. It is also clear from the above equation that an increase in the money supply within an economy would lead to appreciation of the domestic currency. Conversely, international price level as well as the output level relates inversely with the exchange rate (Frenkel and Johnson, 1978).

2.2.5 HICKSIAN IS – LM MODEL

A simple theoretical review for the effect of monetary policy in an economy is illustrated by the LM curve. The LM curve is a curve that shows the various combination of interest rate and national income in which the economy is said to be at equilibrium. The LM curve represents the money market, and it also reveals the impact of monetary policy on the level of interest rate and national income. An expansionary monetary policy will lead to a rightward shift of the LM curve, which will bring about a fall in interest rate and an increase in national productivity. This is illustrated in the diagrams below.

Fig. 2.2.5: Hicksian IS – LM Model



From the diagram above, LM1 is the initial LM curve, while the IS curve is assumed to be static. An expansionary monetary policy caused the LM1 curve to shift the right to LM2. This led to a fall in interest rate from I1 to I2, while national income increased from Y1 to Y2. The simply implies that a persistent increase in the monetary variable would as well boost the GDP of the country's economy (Anyanwu, 1990), (Mankiw, 2002), and (Handa, 2009).

On the contrary, the application of these theories on the structure of Nigeria economy as proved successful in promoting and improving a fast sustainable growth rate in the country.

CHAPTER 3

ADMINISTRATION OF MONETARY POLICY IN NIGERIA

3.1 MONETARY POLICY IN NIGERIA

Monetary policy plan thought by the President is recommended by CBN through a notification regularly titled, cash related and credit strategy proposition which is addressed for a specific monetary year. The update, information of all the game plan branches of the CBN is formed by the examination division. This information considers the perspectives and proposals of monetary policy framework administrators, the business group, and other intrigued individuals from general society. It likewise considers the predominant monetary conditions, prospects and the arrangement goals that seem most suitable to seek after in the quick future. The reminder is at first considered by the council of Governors, the most elevated administration body for the everyday organization of the CBN. It is at long last talked about, altered, if need be, and affirmed by the top managerial staff of the CBN. From that point, it is transmitted by the Governor of the CBN to the President for thought and support. After due discussion with diverse organs of government by the president, they decide on the recommendations to acknowledge and proclaims the proposition in the money related recompense. As quoted by (Odozi, 1992), it is fitting to incorporate here that in the present Nigerian setting, the accomplishment of cash related methodology rotates altogether on the extent to which the budgetary project of the legislature can be mixed with the destinations of financial system. This is a result of the basic piece of the organization in the economy and thus the governing body has continued being the greatest wellsprings of liquidity improvement in the structure.

In any case, after the monetary policy declaration, the acknowledged recommendations are in this manner laid out for banks and other money related foundations by the CBN, as the monetary approach roundabout for consistence. Punishments for rebelliousness with determined rules are likewise demonstrated in the round.

As an observing gadget, the CBN runs periodic and outstanding inspections of the books of each and every approved bank which are also required to prepare report on returns of operations to the CBN. The inspections and returns from the cash related establishments and also current

budgetary headways engage the CBN to assess consistence with the financial strategy roundabout, and to choose the prerequisite for transformation in the round. Repetitive revisions to the round are endeavored by the CBN, while key changes must be inspected with the President.

3.2 FINANCIAL DEVELOPMENT

Financial development is one of the necessities for reasonable sustainable economic growth in any economy. The supply of finance to different sector of the economy will advance the development of the economy in an encompassing way and this will make improvement, welfare change to continue at a quicker rate.

The Central Bank of Nigeria financial initiative include the formulation and implementation of different policies, innovation and creation of empowering environment for budgetary organizations to convey administrations in a successful, effective and feasible way. The initiatives are essentially focused at agricultural sector, rural development and micro, small and medium enterprises.

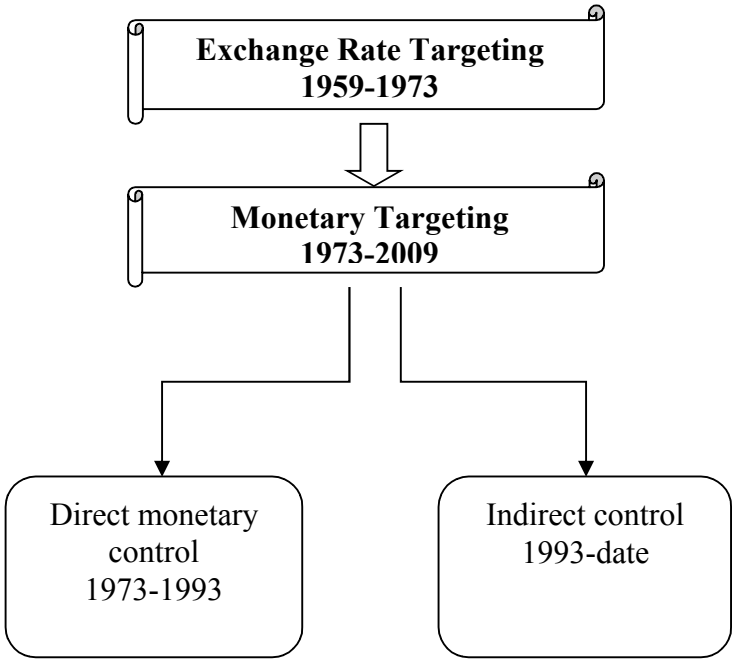
3.3 MONETARY POLICY FRAMEWORK IN NIGERIA

The monetary policy framework refers to the strategies that the monetary authority adopts in achieving its policy objectives.

- Exchange rate targeting
- Monetary targeting
- Interest rate targeting
- Inflation targeting
- Nominal GDP targeting

The illustration below gives us a breakdown on how the objectives have been achieved so far.

Fig 3.3.1: The conduct of monetary policy in Nigeria.



3.4 NEW MONETARY POLICY IMPLEMENTATION FRAMEWORK

The central bank of Nigeria introduced a new monetary policy implementation in December 2006 with the aim of achieving standardized financial development in the economy by reducing interest rate volatility to ensure that money market rates, especially the overnight bank rates are more responsive to the policy rates. Also, preparatory steps towards transiting to fully fledged inflation targeting (Ezema, C.C 2009). The following features are been considered:

- A new monetary policy rate (MPR) replaces the minimum rediscounted rate (MRR) as anchor for monetary policy.
- The operating target is the overnight interbank interest rate.
- The transmission mechanism is largely through the term structure of interest rate.
- The intermediate target should include the prime lending rate.

3.5 INSTRUMENTS OF MONETARY POLICY IN NIGERIA

The instruments of financial strategy are of two sorts: to begin with, quantitative, general or indirect; and secondly, qualitative, selective credit control or direct. They influence the level of total interest through the supply of cash, expense of cash and accessibility of credits. These two sorts of instruments include the accompanying:

A. The quantitative, general or backhanded money related instrument incorporates bank rate varieties, open business sector operations, changing store prerequisites, rebate window operation and good suasion. They are intended to control the general level of credit in the economy through business banks.

B. The qualitative, selective credit control or direct go for controlling particular sorts of credit. They incorporate changing edge necessities and regulation of customer credit.

More précised clarification would be shed on the quantitative, general or indirect money related instrument, in light of the fact that it is the principle instrument utilized by the Central Bank of Nigeria in the regulation of financial strategy norms.

3.5.1 BANK RATE VARIATION

The bank rate is the base loaning rate of the Central Bank at which it rediscounts top of the line bills of trade and government securities held by the commercial banks. The Central Bank raises bank rate on the development of inflationary weights inside of the economy. Getting from this, the Central Bank turns out to be unreasonable and commercial banks obtain less from it. The commercial bank, thusly, raises their loaning rates to the business group and borrowers acquire less from commercial banks. These constrictions of credit and costs are checked from the rising in bank rate. Further, despite what might be expected, when costs are discouraged, the Central Bank brings down the bank rate. It is shoddy to get from Central Bank with respect to commercial banks. The recent likewise bring down their loaning rates. Representatives are urged to obtain more, ventures are supported, Output, job, wage and request begin rising and the descending development of costs is checked.

3.5.2 OPEN MARKET OPERATION

The OMO was presented toward the end of June 1993 and is directed completely on Nigerian Treasury Bills (NTBs), including repurchase understandings (REPOS). Open market operations allude to the dealings and buying of securities in the currency market by the Central Bank at the point when costs are rising. The Central Bank controls this raise in costs and then offers securities to the market. The reserves of commercial banks are decreased and they are not in a position to loan more to the business group. Further investment is demoralized and the ascent in prices is checked. On the Contrary, when recessionary strengths rise in the economy, the Central Bank purchases securities. The reserves of commercial banks are raised. They loan more. Investment, output, jobs, income and demand rise, and fall in price is checked.

On the other hand, the OMO involves the deal or buy of qualified bills or securities in the open business sector by the CBN with the end goal of impacting store cash, banks store equalizations, and the level of base cash and thus the general level of money related and budgetary conditions. In this exchange, banks subscribing to the offer, through the rebate houses, draw on their store equalizations at the CBN along these lines decreasing the general liquidity of managing an account framework and the banks' capacity to make cash by means of credit. In executing the OMO, the Research Department of the CBN prompts the exchanging work area at the Banking Operations Department, additionally of the CBN, on the level of abundance or setback in bank holds. From that point, the exchanging work area chooses the sort, rate and tenor of the securities to be offered and advises the markdown houses 48 hours in front of the offer date. The most noteworthy offer value (least rebate rate cited) for deals and the most minimal cost offered (most elevated markdown offer) for buys, with the fancied size or volume, is then acknowledged by the CBN. (CBN, Act. 2007)

The main component Central Banks can control intently is it arrangement of securities. The various variables can't be firmly controlled. Inside of the structure of elements influencing stores, the Central Bank takes after a three stage strategy in leading OMO which are as per the following underneath:

1. Determination of the objective level of stores steady with the target of money related arrangement

2. Estimation of the net change available for later that will happen because of development in controllable elements

3. Conduct of open business sector operation that expand or lessening security possessions, enough to realize the objective level of store.

Attributable to its character as a business sector based intercession component, and also substantial incline of that if offers for value feast and steady modification of liquidity on a day by day or week after week premise, open business sector operation would at last be the prevailing instrument of money related strategy in the administration of backhanded controls in Nigeria.

The adaptability that it gives allows its utilization so as to undue disturbance and instability in the money related markets. Also where there is an extensive blunder in the figure of supply, it interest for stores happens, restorative move can be made the following day or week. The ideal utilization of open market operations accordingly depend essentially on significant information being accessible over short interims, for example, every day, week by week or fortnightly. (Nnanna,O.J., 2001)

3.5.3 CHANGING RESERVE REQUIREMENT

The CBN supplements the utilization of OMO with a reserve prerequisite. In this association, the reserve requirement is an instrument for liquidity administration and for prudential regulation. The reserve requirements are the Cash Reserve Ratio (CRR) and the Liquidity Ratio (LR). While the previous is characterized as an extent of the aggregate interest, investment funds and time stores which banks are required to keep as reserve with the CBN, the last alludes to the extent of banks fluid advantages for their aggregate store liabilities. The CRR and liquidity proportion have been logically expanded or diminished relying upon the correlative part the financial power has a tendency to accomplish. (CBN, Act. 2007)

This weapon was recommended by Keynes in his treatise on cash and the USA was the first to embrace it as money related gadget. Each bank is required by law to keep a sure rate of its aggregate reserve as a store reserve in its vaults furthermore a sure rate with the Central Bank. At the point when costs are rising, the Central Bank raises the reserve proportion. Banks are required to keep more with the Central Bank. Their reserves are decreased and they loan less.

The volume of venture, yield and work are unfavorably influenced. In the inverse case, when the store proportion is brought down, the stores of commercial banks are raised. They loan more and the financial action is acceptably influenced. (Ojo, M.O., 2001)

3.5.4 DISCOUNT WINDOW OPERATION

The CBN markdown window offices were set up entirely in accordance with the moneylender of final resort part, which the Bank is relied upon to play. Henceforth, it has kept on giving credits of a fleeting nature (overnight) to banks needing liquidity. The offices are collateralized by the acquiring establishment's holding of government obligation instruments and some other instrument endorsed by the CBN and subject to a greatest standard. The Minimum Rediscount Rate (MRR) is the ostensible stay, which impacts the level and bearing of other financing costs in the residential currency market. Its developments are for the most part planned to motion market administrators, the monetary policy strategy position of the CBN. (CBN, MPF. 2011)

3.5.5 MORAL SUASION

The CBN receives this methodology as a method for building up two-route correspondence with the banks, accordingly making a superior situation for the adequacy of monetary policy approach. The principle parkway of contact is the Bankers Committee, which meets two-month to month. This dialog with banks was further extended in November 2000 to incorporate different partners containing key government authorities, money related business sector administrators, scholastics, and so forth, under the parasol of the Monetary Policy Forum. The target of the Forum is to improve the straightforwardness of the Bank's monetary policy procedure. (CBN, Act. 2007)

3.5.6 SELECTIVE CREDIT CONTROL

Selective credit controls are utilized to impact on particular sorts of credit for specific purposes. Therefore, the most part takes the type of changing edge prerequisites to control theoretical exercises inside of the economy. At the point when there is lively theoretical action in the economy or specifically parts in specific things and costs begin rising, the Central Bank raises the edge prerequisites on them. The outcomes are that the borrowers are given less cash in advances against determined securities. One of the real targets of monetary policy strategy in

Nigeria is value soundness. In any case, in spite of the different financial administrations that have been embraced by the Central Bank of Nigeria throughout the years, expansion still remains a noteworthy danger to Nigeria's monetary development. Nigeria has encountered high unpredictability in inflation rates (CBN, MPF. 2011). The development of money supply is connected with the high expansion scenes in light of the fact that cash development was frequently in abundance of genuine financial development. Be that as it may, going before the development in money supply, a few components mirroring the basic attributes of the economy are noticeable. Some of these are supply stuns, emerging from components, for example, starvation, cash cheapening and changes as far as exchange. (Olaloye, A.O and S.I Ikhide, 1995)

3.6 OBJECTIVES OF MONETARY POLICY

Monetary policy objectives can be seen as measures intended to manage and control the volume, expense and bearing of cash and credit in the economy to accomplish some predetermined financial upstream targets which can change every once in a while relying upon the monetary fortunes of a specific Nation. For the most part, the goals of monetary policy approach incorporate full job, fast monetary improvement, value strength and parity of installment harmony. In Nigeria, the over-riding point of our advancement exertion remains that of realizing a change in the living state of our kinds. (CBN, Act. 2007)

The board target of monetary policy strategy incorporates:

A. The control of inflation and upkeep local value and conversion standard dependability.

B. Maintenance of sound equalization of payment position i.e. Balance of payment.

C. Development of sound monetary framework to achieve economic stability.

D. Promotion of quick and practical rate of financial market efficiency and advancement.

It is however not easy to achieve all the above stated objectives simultaneously. At times, success is achieved at the expense of failure. On the others since the objectives may not be of equal importance for all times in any economy, there is always the need to determine the main

focus of policy at any given point in time. Therefore, choice has to be made of a desired combination of objectives, depending on the prevailing economic circumstances.

However, pertinent to emphasize that monetary policy is the only supportive of the national economic development strategy and policy which also call for the application of fiscal, exchange rate and other sectoral policies. Consequently, monetary policy needs to be designed to attain a realistic and consistent set of objectives within the general economic policy framework of the country. (Ajisafe, R.A and B.A, Folorunso, 2002)

3.7 MONETARY POLICY AS A TOOL FOR ECONOMIC GROWTH

Consistent and stabilized monetary strategy is certainly a set of demand management measures, which intends to eradicate some macroeconomic imbalances, which if allowed to persist could be inimical to long term growth.

According to Anyanwu (2003), countries seeking for sustainable economic growth after a period of macroeconomic imbalances must first and foremost get stabilized. In Nigeria, monetary policy implementation is a veritable tool for stable economic growth. Efforts for sustainable growth began in Nigeria in the early 1980's in response to the emergence and persistence of unstable macroeconomic development. There was need to add basic elements of economic instability such as the expended government spending which resulted in large deficits. The instability variables that needed to be stabilized are:

I. Excessive government borrowing
II. Rapid monetary expansion
III. Inflation
IV. Chronic over valuation of national currency
V. Reduced export competitiveness
VI. Introduction of new currency note

In Nigeria, the aftereffect of government part in monetary exercises and the accomplishments in financial execution, Nigeria has been blended. The economy experienced development in

genuine yield in a few years and decreases in others. Be that as it may, the general picture is low scoring for the nation's advancement endeavors. The financial emergency from the 1980s and mid-1990s brought out strikingly the qualification in the middle of development and advancement. The goals of monetary policy and other macroeconomic arrangements in Nigeria are boundless; these incorporate increment in Gross Domestic Product development rate, decrease in the rates of expansion and unemployment, change to be decided of installments, aggregation of budgetary investment funds and outside stores and also strength in Naira swapping scale. (Anyanwu, 2003)

CHAPTER 4

RESEARCH METHODOLOGY, SOURCES OF DATA AND VARIABLES

4.1 METHODOLOGY

In this chapter, we extended the literature review to empirical examination to ascertain the relationship between a stabilized monetary agreement and economic progression by utilizing existing data set by testing strength of the experimental results and also analyze the shift in the changes in monetary policy rates by minimizing real exchange rate, rediscounted interest rate and increase credit to private sector.

4.2 MODEL SPECIFICATION

The Theoretical literature on monetary policy and economic growth has been considerably subjective by Barro (1990). Endogenous growth models have emphasized the size and organization of taxation and public spending as having influence on the potential growth of the economy.

Based on this discussion, a model of standardized monetary policy and its instruments on economic performance of Nigeria can be adopted from a previous study conducted by Wosowei (2013) with some few adjustments. The final form of the model will take the form.

$GDP = F (MS_t, CPS_t, DINT_t, REER_t)$…….. (1)

From the above model, GDP is equal to function of stabilized monetary policy instruments in that precise t year.

Econometrically, the model would design as:

$GDP = \beta_0 + \beta_1 MS_t + \beta_2 CPS_t + \beta_3 RINTt + \beta_4 REER_t + \varepsilon_t$..... (2)

Where,

GDP = Gross Domestic Product in year t

MS = Money Supply in year t

CPS = Credit to Private Sector in year t

RINT = Rediscounted Interest Rate in year t

REER = Real Effective Exchange Rate in year t

β0 = Intercept Parameter, and β1… β4 (Betas) are the relapse coefficient or slope parameters for the different regressors (illustrative variables expressed previously). The term εt, which is known as the stochastic mistake term of the relapse is acquainted to signify the unexplained variables in the model.

4.3 METHOD OF ANALYSIS

This study will employ Vector Error Correction Model (VECM) techniques to appraise the impact of monetary policy stabilization. The statistical properties of the series will be examined. Engel and Granger (1987) observed that most economic time series data are not stationary over time. This prompts the exploration of the statistical assets of the variables. The three statistical tests for our series are Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests, Johansen co-integration tests which is deployed to determine the long running relationship amongst monetary policy variables and economic growth.

4.3.1 UNIT ROOT TEST FOR STATIONARITY (ADF AND PP)

Most of economic data are having unit roots (i.e. are not stationary) and this result to the problem of spurious regression. In order to do away with this problem the study conducts a test for stationarity for the periodic series data using the Augmented Dickey Fuller (ADF) tests. The optimum lag length for ADF test will be determined by Schwarz information criterion (SIC). When there is unit root in the data, the corresponding time series will be considered non-stationary.The formal ADF test procedure can be presented by the following equation:

$$\Delta X_t = a_0 + a_1 t + \beta X_{t-1} + \sum_{j=1}^{p} \delta j \, \Delta X_{t-1} + \mu_t \quad \text{..... (3)}$$

Where

ΔX_t denotes first difference of the time series data while p represent the lag order and t is representing time. In the ADF result, we do not accept the null hypothesis that variable (x) is non stationary (H0: $\beta = 0$) if β is significantly negative.

4.3.2 JOHANSEN CO-INTEGRATION TEST

Studies in empirical macroeconomics almost involve non stationary and trending variables, such as income, consumption, money demand, the price level, trade flows, and exchange rates. Accumulated wisdom and the results of previous testing suggest that the appropriate way of manipulating such series is to use differencing and other transformation to reduce them to stationarity and then to analyse the resulting series as VAR or with the methods of box and Jenkins. But recent research and a growing literature have shown that there are more interesting, appropriate ways to analyse trending variables.

A characteristic initial phase in the investigation of co-integration is to build up that it is surely normal for the information. Two expansive methodologies for testing for co-integration have been produced. The Engle and Granger (1987) technique depends on evaluating whether single-comparison assessments of the harmony mistakes gives off an impression of being stationary. The second approach, because of Johansen (1988, 1991) and stock and Watson (1988), depends on the VAR approach.

On the off chance that every one of our variables are set up to be of the same request of integration, we advance to test for the presence of co-integration among the included variables. What we do here is to test whether there is a long run relationship between non stationary information that is co-integrated of the same request. As presented by Johansen (1988) and Juselius (1990), the test for co-integration is performed on keeping in mind the end goal to analyse if our variables display long run harmony relationship. The Johansen way of co-integration test is introduced utilizing the mathematical equation below:

$$\Delta Y_{t-1} = \Gamma_0 + \Gamma_1 \Delta Y_{t-1} + \Gamma_1 \Delta Y_{t-2} + .. + \Gamma_{k-1} \Delta Y_{t-k} + \Pi Y_{t-k} + \varepsilon_t \quad (t = 1, 2, .., T) \text{.....(4)}$$

Where: Δ denotes difference operator, Y_t represent a$p \times 1$ vector of non stationary variables (at level), while Γ_0 is the deterministic trend of model and e_t is the random errors term. Π is the error correction terms (ECT) which provides information about the adjustment to the long-run equilibrium of the VECM.

As argued by Engle and Granger (1987), it is essential that the co-integrated series have an ECM representation. This why the co-integration investigation gets to be mainstream as it gives a formal foundation to testing and evaluating both in the short-run and long run connections among financial variables. Moreover, ECM procedure provides an adjustment to the possible problem associated with regression.

Thus, Ordinary regression analysis is only meaningful when applied to stationary data. However, the ordinary least square is advantageous because of its BLUE property, i.e. the best, linear, unbiased estimator. If the two different series are non-stationary individually, but are co integrated among the variables, we can however apply a Vector Error Correction Mechanism (VECM) which enables the researchers to link the long and short run associationship. Also the co-integration technique and VECM has a certain advantages over the traditional partial adjustment model that is, it is central to econometric modeling of integrated variable data consistency, given that the variables (GDP, money supply, exchange rate, rate of interest, and credit to private sector) used in this study are cohesive in a matching direction, information is greatly enhanced since both the short-run changes in the variables used in the research and the long-run relationship will be included in the VECM specification and the log in VECM is not as restrictive as the traditional model (Oluranti, 1996).

4.4 SOURCE OF DATA

To accomplish the set goal of this exploration, optional information would be sourced and extricated from the Central Bank of Nigeria statistical bulletin, measurable notice and yearly announcement of the National Bureau for Statistics and World Bank metadata for the period 1981-2013. The 33 years period of the study covers the shocks in the economy including structural adjustment program (SAP) and economic meltdown.

4.5 VARIABLES DESCRIPTIONS AND EXPECTED RELATIONSHIP SIGNS

To appraise the impact of monetary policy strategy on economic progression, some monetary variables have been distinguished to catch the effect of the different transmission channels.

Table 4.5.1: Expected relationship of variable(s)

Independent variables	**Positive**	**Negative**
Money supply (MS2)	+	
Credit to private sector (CPS)	+	
Rediscounted interest rate (INT)	+	-
Real effective exchange rate (REER)	+	-

Money Supply (MS2)

Money supply is the aggregate sum of cash accessible in an economy at a specific purpose of time. The significance of a proper financial aggregate can scarcely be over accentuated, especially for those nations that join their monetary policy to monetary aggregate.

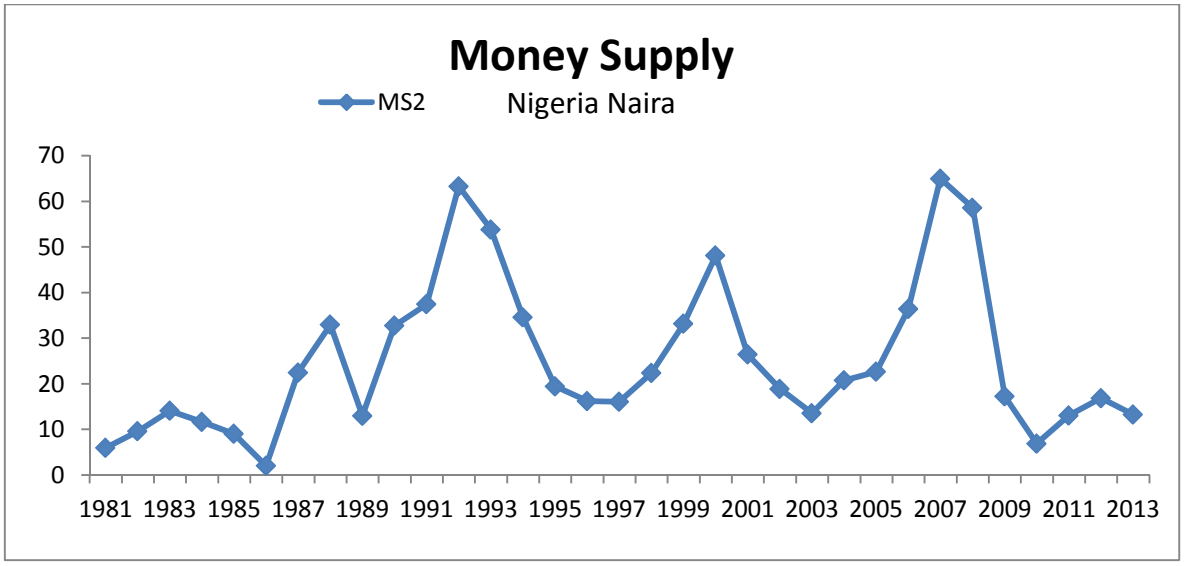
Lauchin Curries (1935), through the money multiplier theory gave an explanation of the supply of money and the degree to which it could be controlled by the central bank. The central theme of Currie's work is an extension of the analysis given by Phillips, Rogers, Angell and Ficek. In fact, the credit for an early attempt to formulate behavioral hypothesis about the variables whose change affects the supply of money goes to Currie. Then there was a long gap because of 1930s. Depression and its solution provided by Keynes in the General Theory of Employment Interest and Money in 1936. Lord Keynes was of the view that money is insignificant and only changes in the rate of interest affects economic activities in a very important way.

Therefore, the money supply would increase the real interest rate, in this case the increase in the discount rates due to the increase the real interest rate which lead to decrease in GDP. Another explanation advocates of the relationship between GDP and the changes in the money supply, if the increase in money supply lead up to inflation as well as contributes to inflation uncertainty. Thus, it may have a negative influence on GDP. As we mentioned previously, reviewed different empirical studies that has been conducted on monetary policy in a vary time spans, some

empirical study indicate there is a negative relationship between money supply and economic growth.

In this study, aggregate money supply, M2, consists of currency in circulation and other money equivalents that can easily be converted to cash plus short term time deposits in banks and 24 hours money market funds.

Fig 4.5.1: Nigeria Aggregate Money Supply 1981-2013.



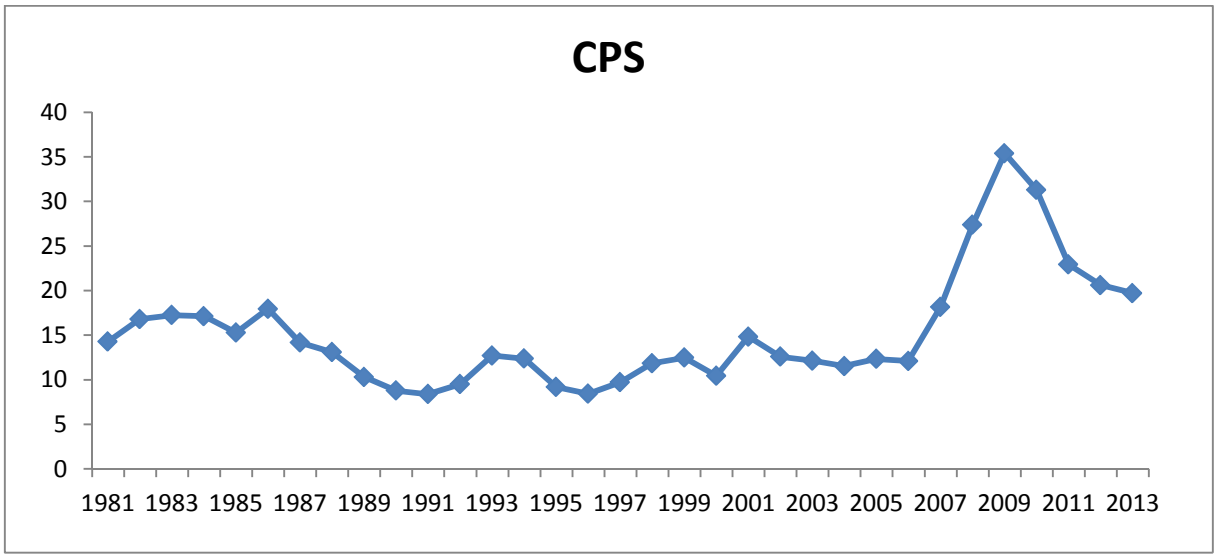
Source: Central Bank of Nigeria Statistical Database.

Credit to Private Sector (CPS)

The credit to private segment is received to evaluate the effect of cash available for use between people in general and private area in an economy. The endogenous growth literature underscores the role of finance in promoting long run economic growth and hence, provides a good starting ground for analyzing and understanding the impact of credit on economic performance. The neoclassical growth model developed by Solow (1956, 1957) and others is extended by incorporating the role of credit. Greenwood and Jovanovich (1990) observe that financial institutions produce better information, improve resource allocation (through financing firms with the best technology) and thereby induce growth. It has also been argued that financial institutions like the banking sector are much better placed to evaluate prospective entrepreneurs

and hence, likely to finance the promising ones thereby increasing the probability of successful innovation which accelerate economic growth (King and Levine, 1993).

Fig 4.5.2: Nigeria Bank Credit to Private Sector 1981-2013



Source: Central Bank of Nigeria Statistical Database.

Rediscounted Rate of Interest (RINT)

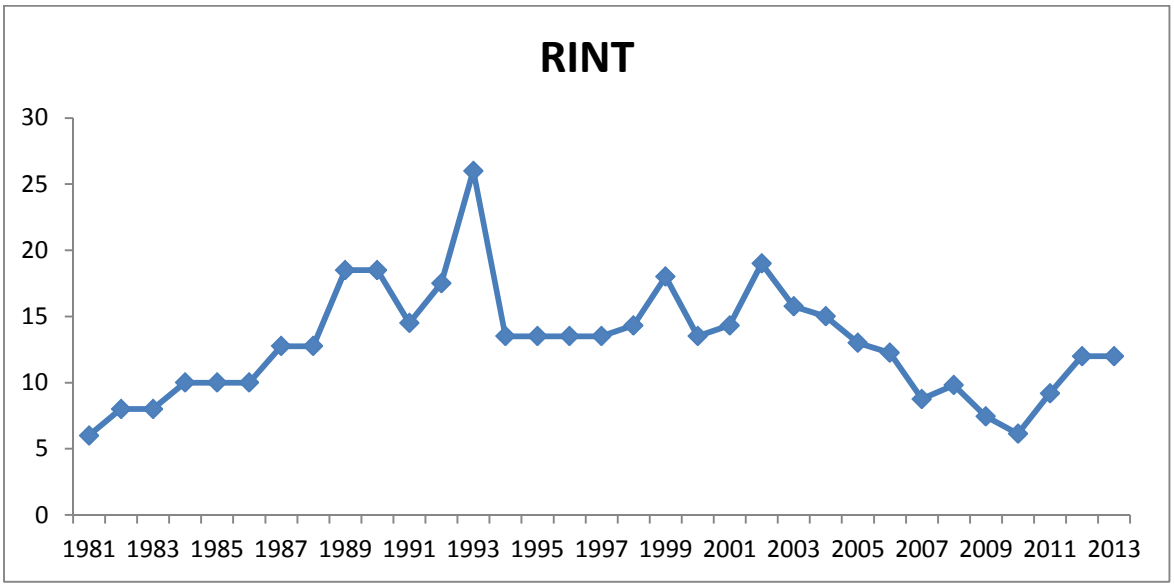
The term rediscounted interest rate as a rule means the rate of interest charged to member banks when they borrow from the Federal Reserve System. Frequently called the discount rate. Loewenstein and Prelec (1992), in his theory explained that discount rate can thus be described by two parameters: a rate of pure preference for the present δ, and a factor γ that reflects the elasticity of marginal utility to changes in consumption. The efficient discount rate r is linked to the rate of growth of GDP g in the following formula:

$$r = \delta + \gamma g$$

Intuitively, as suggested by this formula, a larger growth in the economy should induce us to make less effort for the future. This is achieved by lowering the discount rate. Weitzman (2001) showed that if there is some uncertainty on the future return to capital, and if society is risk-neutral, the year-to-year discount rate should fall progressively to its smallest possible value. Newell and Pizer (2004) arrived at a similar conclusion. It is important to observe that this declining rate comes on top of the variable short-term discount rate, which should be frequently adapted to the conditions of the market interest rate. This study uses discounted interest rate as

proxy for Nigeria economy to investigate the relationship between monetary policy and GDP in Nigeria economy.

Fig 4.5.3: Rediscounted Interest Rate 1981-2913



Source: Central Bank of Nigeria Statistical Database.

Real Effective Exchange Rate (REER)

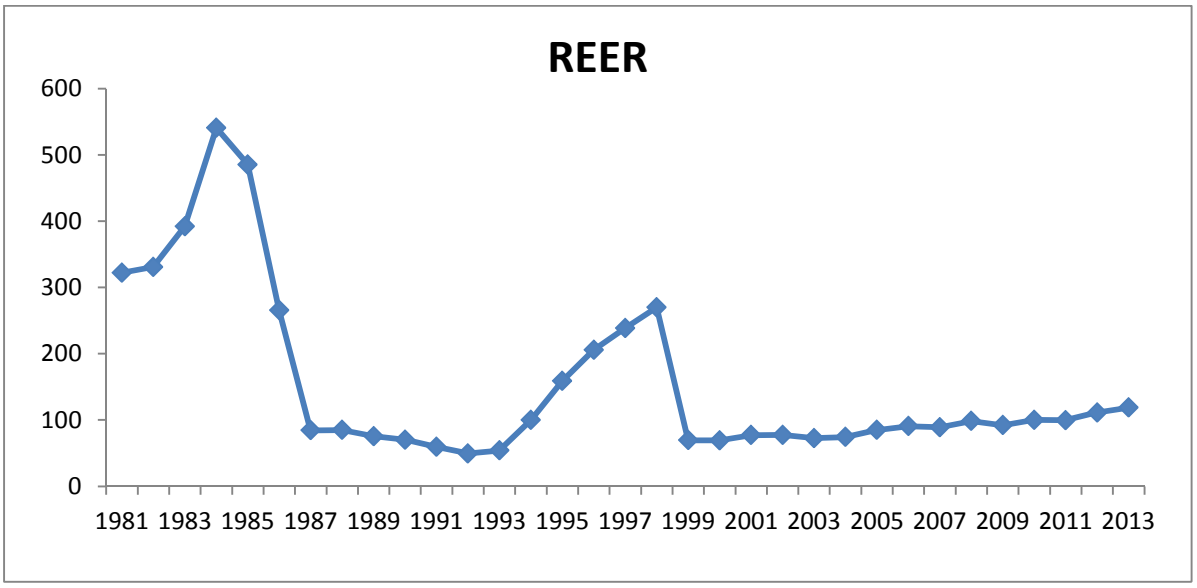
Exchange rate is the difference in currency value between two or more countries at a particular period of time; the real effective exchange rate is the nominal real rate i.e. a measure of the value of the Nigerian currency against a weighted average of several foreign currencies divided by a price deflator or index of cost.

According to Gustav Cassel (1921), in the theory of Exchange rate determination, he postulated that at the point where external equilibrium is obtained in an economy, increase in the money supply within an economy would lead to appreciation of the domestic currency. Conversely, international price level as well as the output level relates inversely with the exchange rate. Many literatures have examined the relationship among exchange rate and economic growth.

Edwards (1986), this line of research hypothesis that a country's equilibrium exchange rate is determined by a set of 'fundamentals', but various factors such as distortionary monetary and fiscal policies can cause the actual rate to deviate from the equilibrium rate. In comparison with the equilibrium values, one can then assess if the real exchange rate is overvalued.

Overwhelming evidence exists and there seems to be a consensus that overvaluation has adverse implications for growth (Dollar, 1992; Easterly, 2005).

Fig 4.5.4: Nigeria Naira Real Exchange Rate



Source: Central Bank of Nigeria Statistical Database.

CHAPTER 5
DATA PRESENTATION, ANALYSIS AND SUMMARY

5.1 PRESENTATION TESTING

In the first section, hypothesis testing was clearly stated on how the findings would be presented, whether we accept Null and reject Alternative or reject Null and accept Alternative hypothesis. Nevertheless, our data were tested in different econometrics analysis methods and results are been presented below according to the series testing.

5.2 UNIT ROOT TEST RESULTS

The unit root test is used to check for the stationary of the model; The Augmented Dickey-fuller tests (ADF) and Philips Perron (PP) were employed to test for stationary in the model. The Augmented Dickey-fuller test (ADF) result is accessible below in table 5.2.1 and 5.2.1

Table 5.2.1: Augmented Dickey-fuller Unit root Test: constant and linear trend.

Series	Order	ADF Test Statistics	5% Critical Value	10% Critical Value	P. value
LGDP	Level	-1.69124	-3.557759	-3.212361	0.7318
	First D.	-5.012821	-3.562882	-3.215267	0.0017*
LMS2	Level	-2.322028	-3.568379	-3.218382	0.4102
	First D.	-4.153577	-3.574244	-3.221728	0.0143*
LCPS	Level	-2.458628	-3.562882	-3.215267	0.3447
	First D.	-4.226836	-3.562882	-3.215267	0.0115*
LRINT	Level	-2.809285	-3.557759	-3.212361	0.2044
	First D.	-6.509646	-3.562882	-3.215267	0.0000*
LREER	Level	-2.554950	-3.562882	-3.215267	0.3018
	First D.	-4.179303	-3.562882	-3.215267	0.0128*

Source: Author's Estimation Using E-views 8.1, check Appendix I for full computation.

From the results in Table 5.2.1, all series were not stationary at level, which simply means that the ADF test statistics values was below the critical values at 5% and 10% in absolute value. But after estimation of taking the first difference in the series, its shows that the ADF test statistical values is greater than the critical value, which implies that the series model is stationary and

therefore has no unit root. Hence, we cannot accept the null hypothesis but reasonably accept the alternative hypothesis that the variables are stationary.

Table 5.2.2: Augmented Dickey-fuller test equation: Lag (-1) series models.

Variable	Coefficient	Std. Error	T-Statistic	Prob.
D(LGDP(-1))	-0.948951	0.189305	-5.012821	0.0000
D(LMS2(-1))	-1.735656	0.41787	-4.153577	0.0004
D(LCPS(-1))	-0.765955	0.181213	-4.226836	0.0002
D(LRINT(-1))	-1.191952	0.183105	-6.509646	0.0000
D(LREER(-1))	-0.765461	0.183155	-4.179303	0.0003

Source: Author's Estimation Using E-views 8.1, check appendix I for full computation.

From the results in Table 5.2.2, explains the Augmented Dickey-fuller test equation, its shows that the entire series model coefficients are carrying a negative sign (-) i.e., Lag (-1) simply means that the models are valuable. Alternatively the results can be concluded by using the P value i.e. if the p value is less than 5% which is said to be significant.

Table 5.2.3: Philips Perron Unit root Test: constant and linear trend.

Series	Order	PP Test Statistics	5% Critical Value	10% Critical Value	P. value
LGDP	Level	-1.681334	-3.557759	-3.212361	0.7362
	First D.	-4.995448	-3.562882	-3.215267	0.0018*
LMS2	Level	-3.092383	-3.557759	-3.212361	0.1251
	First D.	-14.23981	-3.562882	-3.215267	0.0000*
LCPS	Level	-1.664722	-3.557759	-3.212361	0.7434
	First D.	-4.565339	-3.562882	-3.215267	0.0051*
LRINT	Level	-2.751843	-3.557759	-3.212361	0.2242
	First D.	-6.509646	-3.562882	-3.215267	0.0000*
LREER	Level	-2.073085	-3.557759	-3.212361	0.5405
	First D.	-3.998972	-3.562882	-3.215267	0.0194*

Source: Author's Estimation Using E-views 8.1, check Appendix I for full computation.

The Philips Perron Test results also show that at level all the series have unit root, which implies that PP test statistical value is lower than the critical value at 5% and 10%; therefore we say that the models are not stationary. But after taking the first difference (-1) in the models, the PP test

statistics becomes greater than the 5% and 10% critical value at absolute and we conclude that the models as no unit root and are said to be stationary. See Table 3 and 4 below for the computed test results.

Table 5.2.4: Philip Perron test equation: Lag (-1) series models.

Variable	Coefficient	Std. Error	T-Statistic	Prob.
D(LGDP(-1))	-0.948951	0.189305	-5.012821	0.0000
D(LMS2(-1))	-1.11483	0.187185	-5.955774	0.0000
D(LCPS(-1))	-0.765955	0.181213	-4.226836	0.0002
D(LRINT(-1))	-1.191952	0.183105	-6.509646	0.0000
D(LREER(-1))	-0.765461	0.183155	-4.179303	0.0003

Source: Author's Estimation Using E-views 8.1, check appendix I for full computation.

Table 5.2.4 shows the Philips Perron test equations, it's simply means that the models are valuable since the coefficients are having a (-) negative sign and the probability value is below 5%.

5.3 LAG SELECTION

The lag selection is one of the steps in developing the vector error correction model (VECM); the generated optimum lag must be identified and shall be used in Johansen test of co-integration. The table below is the summary of lag selection from the computation of the variables.

Table 5.3.1: VAR Lag Order Selection Criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-39.18614	NA	1.45e-05	3.047320	3.283061	3.121151
1	43.27658	130.8029*	2.84e-07*	-0.915626	0.498818*	-0.472640*
2	69.51734	32.57474	3.09e-07	-1.001196	1.591951	-0.189055
3	94.81325	22.67909	4.95e-07	-1.021603	2.750247	0.159693
4	127.9917	18.30533	9.63e-07	-1.585632*	3.364922	-0.03518

Source: Author's Estimation Using E-views 8.1, check appendix II for full computation.

From table 5.3.1 above, the lag selection falls with 2 levels where the figures are been identified by the star signs *, AIC consist of 3 lags while LR, FPE, SC and HQ required 1 lag. Any of the

optimum lags can be used in the Johansen test of co-integration but for our Johansen co-integration test below the optimum 1 lag will be used in the testing.

5.4 JOHANSEN CO-INTEGRATION TEST RESULT

After the testing for the stationary of the variables, The Johansen co-integration test is introduced to check whether if the variables are co-integrated or have a long run relationship within the exogenous variable and endogenous variables. The Johansen co-integration testing comprises of Trace test and Max Eigen test method that tests the null hypothesis of no co-integrating relationship. Both test results are shown in Table 5.4.1 and 5.4.2 below.

Table 5.4.1: Unrestricted Co-integration Rank Test (Trace).

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.787245	109.7567	88.80380	0.0007
At most 1	0.514868	61.78073	63.87610	0.0741
At most 2	0.488745	39.35734	42.91525	0.1085
At most 3	0.318799	18.55984	25.87211	0.3075
At most 4	0.193302	6.659002	12.51798	0.3814

Trace test indicates 1 co-integrating equation(s) at the 0.05 level
Source: Author's Estimation Using E-views 8.1, check appendix II for full computation.

Based on the result from table 5.4.1 above, the trace test indicate 1 co-integrating equation (None *) were the probability value is below 0.05 level, which implies that we cannot accept null hypothesis, testifying that they is no co-integration amongst the variables. But from At most 1 to 4 simply means that the variables are co-integrated in the sense that their probability value is above 0.05 levels, and therefore we accept the null hypothesis.

Table 5.4.2: Unrestricted Co-integration Rank Test (Maximum Eigen value).

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.787245	47.97598	38.33101	0.0029
At most 1	0.514868	22.42339	32.11832	0.4610
At most 2	0.488745	20.79750	25.82321	0.2006
At most 3	0.318799	11.90084	19.38704	0.4244
At most 4	0.193302	6.659002	12.51798	0.3814

Max-Eigen value test indicates 1 co-integrating equation(s) at the 0.05 level
Source: Author's Estimation Using E-views 8.1, check appendix II for full computation.

From the Maximum Eigen Test result above, we observed that they is only 1 indication of co-integrating equation (none*) where the probability value is below 0.05 level, however we reject null hypothesis of no co-integration. But from (At most 1 to 5), the probability value is above 0.05 level and we accept null hypothesis stating that the variables are said to be co-integrated and have a long running affiliation

The table below presents the results of the normalized co-integration equation long run relationship.

Table 5.4.3: Results of Long Run Relationship Model of the Variables.

Variables	Coefficients	Standard error
C	-0.005644	0.00747
LMS2	0.619877	0.12600
LCPS	2.186192	0.27272
LRINT	1.602176	0.35481
LREER	0.627846	0.13211

Source: Author's Estimation Using E-views 8.1, check appendix II for full computation

5.4.1 LONG RUN RELATIONSHIP TEST RESULT

The long run test is introduced to check if they are a significant relationship from the monetary instruments to GDP.

From Table 5.5.1 above shows that the long run co-integration equation will be as follow:

$$GDP = -0.005644 + 0.619877MS_t + 2.186192CPS_t + 1.602176RINT_t + 0.627846REER_t + \varepsilon_t \ldots (5)$$

From equation (5), if all independent variables are held constant, GDP will decrease by (-0.005644) units in the long run.

Money Supply M2 has a coefficient (0.619877) and significant long run effect on economic growth, a unit increase in MS would increase GDP by approximately 0.619877 units. Monetarists therefore believe that in the short-run, expansionary monetary policies may increase the level of real GDP by increasing aggregate demand. However, in the long-run when the economy is operating at the full employment level they consent that the classical quantity theory

remains a good approximation of the link between the supply of money, the price level, and the real GDP. Similar results were found in the studies of Khabo (2002), Fasanya, Onakoya and Agboluaje (2013), Mehrara et.al (2010), Daniela and Mihalil (2010). The findings in their study indicate a significant positive relationship between Money supply and economic growth.

Credit to private sector CPS has a positive coefficient (2.186192) and significant long run effect relation with GDP, a unit increase in CPS would increase GDP by 2.186192 units. This result is backed up with the studies of Hoffman and Calza, et.al (2001), their findings reveal a positive significant long-run relationship between private sector bank credits and economic growth. Apparently, lending rates are found to impede economic growth.

Rediscounted interest rate RINT coefficient appears to have a positive (1.602176) and significant long run relationship with economic growth, a unit increase in RINT would as well increase GDP by 1.602176 approximately. Lower and stable discounted interest rate makes a great deal on economic activities, which urge investors to acquire and put resources into productive projects. This outcome is reliable with the observational discoveries of Obamuyi and Olorunfemi (2011). Be that as it may, such a relationship is conceivable, if there is a connection between aggregate investment (public and private) and economic growth.

Real effective exchange rate REER also has a positive coefficient (0.627846) and significant long run association with economic growth, if REER should be increase by a unit, GDP would rise by 0.627846 units respectively. Our result is consistent with the traditional theory explaining the relation between exchange rate and GDP. Although larger undervaluation hinder growth, small to moderate currency undervaluation enhance growth. The positive relation is consistent with previous empirical literature of Amarasekara (2007) who found out that exchange rate appreciation almost always lead to an increase in GDP growth.

5.5 VECTOR ERROR CORRECTION MODEL

The fundamental component of the ECM (Error Correction Model) is its ability to amend for any disequilibrium that may stun the framework now and again. The blunder adjustment term gets such disequilibrium and aides the variables of the framework back to balance. They are 3 steps in developing the vector error correction model, which are as follows:

i. The Lag selection: the optimum lag must be identified and shall be used in Johansen test of co-integration.
ii. Johansen test of co-integration: non-stationary variables at level must be converted into first difference to become stationary integrated of same order.
iii. Finally, VECM.

Apparently, the VECM test can be conducted since all steps above have been properly followed.

5.5.1 THE SHORT RUN CAUSALITY TEST

In order to get an optimistic significant result for the short run causality, we run the Wald test for individual independent variable. The table below presents the results for short run causality.

Table 5.5.1: Short Run Causality Test Result

Wald Test

Series	Null Hypothesis	Chi-square Value	df	P. value
D(LMS2(-1))	C(3)=0	0.001590	1	0.9682
D(LCPS(-1))	C(4)=0	0.872958	1	0.3501
D(LRINT(-1))	C(5)=0	0.005588	1	0.9404
D(LREER(-1))	C(6)=0	0.064770	1	0.7991

Source: Author's Estimation Using E-views 8.1, check appendix III for full computation.

From the result in the table above, the probability value for the Chi-square of the monetary policy variables i.e. MS2, CPS, DINT and REER are above the 0.05 level. It shows that there is no short run causality running from Monetary instruments to GDP, therefore we cannot reject Null hypothesis rather we accept null: C (3) = 0, C (4) = 0, C (5) = 0 and C (6) = 0.

In outline, we can say that there is no short run causality running from monetary policy variables to GDP, which implies that they is no significant relationship between the variables.

5.6 RESIDUAL DIAGNOSTIC CHECKS FOR THE VECMs

The residuals from a regression model are calculated as the difference between the actual values and the fitted values $\varepsilon i = Yi - \bar{Y}i$. Each residual is the unpredictable component of the associated observation.

After selecting the regression variables and fitting a regression model, it is necessary to plot the residuals to check that the assumptions of the model have been satisfied. There are a series of plots that should be produced in order to check different aspects of the fitted model and the underlying assumptions. The VAR was tested for serial correlation Breuch-Godfrey (LM Test), ARCH Test. All tests reveal the suitability of the model; hence the results from this research can be relied on. The following test results are been shown in the table 5.3 below.

Table 5.6.1: Diagnostic Test Results

Test	**Null Hypothesis**	**Probability**
Breuch Godfrey LM test (CH-sq)	No Serial Correlation	0.7374
ARCH Test (CH-sq)	No Conditional Heteroskedasticity	0.8710

Source: Author's Estimation Using E-views 8.1, check appendix III for full computation.

In light of the above result from table 5.3, the probability estimations of Breuch Godfrey serial correlation test (0.7374) is above 0.05 Level. Therefore, the null hypothesis would be accepted stating that there is no serial correlation in the model and it is alluring for the model.

The ARCH test outcome basically demonstrates probability value (0.8710) of the model is more than 0.05 Level. Along these lines we can't dismiss the null hypothesis; rather we acknowledge the null hypothesis, implying that there is no ARCH (Autoregressive conditional heteroskedasticity) in the model and that the residual is absolutely desirable.

5.7 SUMMARY

This research study examines the impact of a stabilized monetary policy on economic growth with the use of monetary policy variables by Utilizing the Augmented dickey- Fuller and Philips Perron Unit Roots Test, Johansen Co-integration and VECM. The empirical findings of the tests are summarized below:

1. Based on the Unit Root Test result (ADF and PP), all variables were not stationary at zero level, which means that they all had unit roots. Therefore they were all transformed into first difference in other to achieve stationarity in the series; the quintessence is to elude unauthentic result.

2. The co-integration test result indicates one co-integrating equation and a positive significant relationship between monetary policy variables and economic growth in Nigeria.

3. The error correction mechanisms test result also explains that they are no short causality running from the monetary policy variables to gross domestic product (GDP). It also indicates that that there is no serial correlation and heteroskedasticity in residual of the model.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

This study has presented the impact of stable monetary policy variables on economic growth in Nigeria for the period (1981-2013). In all cases in the study, the empirical findings perform better for the Nigerian economy. Thus, there is no evidence that the monetary policy variables for Nigeria have become unstable due to financial sector liberalization and reform. Hence, following Friedman's (QTM) analysis whereby a rise in the money amount with unchanged velocity of money in circulation and aggregate output, leads to a proportional growth rate and Hicksian (IS-LM) analysis in which an expansion monetary policy causes a rightward shift in the LM curve making interest rate fall and increasing the income level respectively. As related to these models, it is clear to conclude that the monetary policy variables are the appropriate instruments to be targeted by the Central Bank of Nigeria for economic development.

6.2 RECOMMENDATION

Taking into account the discoveries made over the findings of this study. Our study implemented unit root, co-integration, VECM and diagnostic tests to test the model like autocorrelation and heteroscedactisity. The findings revealed that the monetary policy variables in the model have a positive significant relationship with economic growth in Nigeria. The study recommends that monetary authorities should regulate money supply in the economy to avoid increase in price change, which can affect the standard of living in the economy. Also, measures should be introduced by the Central Bank of Nigeria for longer term credit product to commercial bank in order to make their intermediation roles in the economic growth more significant. The Central Bank should ensure that frivolous charges are reduced by the deposit money banks in Nigeria in order to stimulate deposits and discourage the increasing apathy of the Nigerian public. It is further recommended that good fiscal policy measures should be undertaken alongside monetary, as both are re-enforcing and complementary to enable a favorable investment environment that attracts both domestic and foreign investments thereby promoting a sustainable economic growth in Nigeria.

BIBLIOGRAPHY

Barungi, B. and Michael, A. (2000) "Growth and Foreign Debt: The Ugandan Experience" in Ajai and Khan, External Debt and Capital Flight in sub-Saharan Africa, IMF.

Brauninger, M. (2002), "The Budget Deficit, Public Debt and Endogenous Growth", Journal of Economics, 63(41): pp.1-15.

Chamberlin, G. and Yueh, L. (2006). Macroeconomics. London: Thomsom Publishers.

Cohen, A. (2005) "Low Investment and Large LDC Debt in the 1980s"America Economic Review, 34: pp. 199-208.

De Castro, F. (2004). The Macroeconomic Effects of Fiscal Policy in Spain", Banco de Espana, Working Paper Series, http//www.bde.es

Easterly, and Schmidt-Hebbel, K. (1993). Fiscal Adjustment and Macroeconomic Performance. Outreach 10 May, (World Bank Policy Research Department).

Easterly, W. and Rebelo, S. (1994), 'Fiscal Policy and Economic Growth: An Empirical Investigation', *Journal of Monetary Economics*, 32: 417-458.

Edwards, S. (2001) "Debt Relief and Fiscal Sustainability" NBER Working Paper 8939, Cambridge.

Essien, E. A. andOnwioduokit, E. A. (2002) "Nigeria's Economic Growth and Foreign Debt: An Analytical Re-Examination" CBN Economic and Financial Review, 3(1), March.

Grossman, H. and Elhannan, R. W. (1990) "Foreign Aid, Taxes and Public Investment" Journal of Development Economics, 24: pp. 355-369.

Hnatkovska, V. and Loayza, N. (2005) "Volatility and Growth", the World Bank Working Paper Series, No 3184.

Iyeli I. I. and Ijomah M. A. (2013), "A Re-examination of Fiscal Policy Applicability in Nigeria's Economic Growth Process: An Econometric Policy Evaluation from Empirical Evidence", AMERICAN JOURNAL OF SOCIAL ISSUES AND HUMANITIES, Vol. 3, Issues 4: pp. 180-

Jhingan, M. L. (2003). Macroeconomic Theory.New Delhi: Vrinda Publishers.

Johansen, S. and Juselius, K. (1990).Maximum Likelihood Estimation and inference on Cointegration, with Applications for the Demand for money. Oxford Bulletin of Economics and Statistics (52), 169 - 210.

Johansen, S., (1988).A Statistical Analysis of Co-integration Vectors.Journal of Economic Dynanmics& Control Vol. 12, pp. 231–254.

Central Bank of Nigeria Statistical Bulletin (2007) Volume 18: "An Annual Publication of the Central Bank of Nigeria". Garki, Abuja.

Central Bank of Nigeria (November 2009); Communiqué No. 66 of the Monetary Policy Committee Meeting.

Fischer, S. (2002). "The Role of Macroeconomic Factors in Growth," Journal of Monetary Economics, Vol. 32, pp. 485-512.

Folawewo, A.O., 2006. "Macroeconomic policies and economic growth", Journal of monetary economics, vol 30, pp 233-268.

Jinghan, M.L. (2004). "Acroeconomic Theory". 10th Revised & Enlarged Edition. Vrinda Publications (P) Ltd. ISBN 81-87125-01-2. Pg 99.

Ojo (2001) "Macroeconomic policies and economic growth", Journal of monetary economics, vol 30, pp 233-268.

Rafiq, M.S. & Mallick, S.K., 2008. "The effect of monetary policy on output in EMU3: A sign restriction approach," Journal of Macroeconomics, Elsevier, vol. 30(4), pages 1756-1791, December

Adeyeye EA, Fakiyesi, T.O (1980) Productivity Prices and Incomes Board and Anti-Inflationary Policy in Nigeria. *Success et al. 41* Nigerian Economic Society, Proceedings of the 1980 Annual Conference, Ibadan.

Adebiyi, M.A (2006) "Inflation Targeting: Can we Establish a Stable and Predictable Policy Instrument between Inflation and Monetary Policy Instruments in Nigeria and Ghana?" http://www.google.com.ng

APPENDIX I

LOG OF ORIGINAL SOURCE DATA

YEAR	LGDP	LMS2	LINF	LCPS	LINT
1981	6.566124	1.774952	3.034953	2.658159	1.791759
1982	6.529463	2.256541	2.04122	2.820783	2.079442
1983	6.452238	2.640485	3.144152	2.847232	2.079442
1984	6.406484	2.451005	2.879198	2.839663	2.302585
1985	6.460749	2.196113	2.00148	2.72589	2.302585
1986	6.343072	0.667829	1.740466	2.887033	2.302585
1987	6.203021	3.109507	2.424803	2.649715	2.545531
1988	6.249377	3.493777	3.998201	2.571084	2.545531
1989	6.285886	2.55955	3.921973	2.331173	2.917771
1990	6.380207	3.487375	2.00148	2.172476	2.917771
1991	6.348527	3.621136	2.564949	2.125848	2.674149
1992	6.327615	4.147253	3.797734	2.250239	2.862201
1993	6.323247	3.98453	4.046554	2.542389	3.258097
1994	6.307333	3.540959	4.043051	2.515274	2.60269
1995	6.279309	2.965788	4.287716	2.214846	2.60269
1996	6.303058	2.783776	3.377588	2.129421	2.60269
1997	6.305709	2.775086	2.140066	2.273156	2.60269
1998	6.307479	3.105483	2.302585	2.471484	2.660959
1999	6.287171	3.500137	1.88707	2.523326	2.890372
2000	6.313892	3.872658	1.931521	2.343727	2.60269
2001	6.331911	3.272606	2.939162	2.695978	2.660959
2002	6.343828	2.93492	2.557227	2.532108	2.944439
2003	6.416945	2.60343	2.639057	2.494857	2.75684
2004	6.681958	3.029167	2.70805	2.443216	2.70805
2005	6.689786	3.11795	2.884801	2.511224	2.564949
2006	6.742338	3.593194	2.104134	2.493205	2.505526
2007	6.781727	4.173156	1.686399	2.899221	2.169054
2008	6.815596	4.069539	2.451005	3.309448	2.283402
2009	6.855419	2.845491	2.442347	3.566429	2.006871
2010	6.903426	1.919859	2.617396	3.443299	1.813195
2011	6.921214	2.564949	2.379546	3.131573	2.218116
2012	6.958619	2.820783	2.501436	3.025291	2.484907
2013	7.001218	2.581731	2.140066	2.980619	2.484907

UNIT ROOT TEST ADF AND PP

Null Hypothesis: LGDP has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.691240	0.7318
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LGDP)

Method: Least Squares

Date: 01/12/16 Time: 12:18

Sample (adjusted): 1982 2013

Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.104128	0.061569	-1.691240	0.1015
C	0.603641	0.383239	1.575105	0.1261
@TREND("1981")	0.005146	0.001514	3.398762	0.0020

R-squared	0.294070	Mean dependent var	0.013597
Adjusted R-squared	0.245385	S.D. dependent var	0.068499
S.E. of regression	0.059504	Akaike info criterion	-2.716473
Sum squared resid	0.102682	Schwarz criterion	-2.579061
Log likelihood	46.46357	Hannan-Quinn criter.	-2.670925
F-statistic	6.040281	Durbin-Watson stat	1.876874
Prob(F-statistic)	0.006413		

Null Hypothesis: D(LGDP) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.012821	0.0017
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LGDP,2)

Method: Least Squares

Date: 01/12/16 Time: 12:28

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-0.948951	0.189305	-5.012821	0.0000
C	-0.041467	0.026141	-1.586267	0.1239
@TREND("1981")	0.003296	0.001445	2.280516	0.0304

R-squared	0.473090	Mean dependent var	0.002557
Adjusted R-squared	0.435453	S.D. dependent var	0.084364
S.E. of regression	0.063388	Akaike info criterion	-2.587319
Sum squared resid	0.112505	Schwarz criterion	-2.448546
Log likelihood	43.10345	Hannan-Quinn criter.	-2.542083
F-statistic	12.56999	Durbin-Watson stat	1.959013
Prob(F-statistic)	0.000127		

Null Hypothesis: LMS2 has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.322028	0.4102
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LMS2)

Method: Least Squares

Date: 01/12/16 Time: 12:32

Sample (adjusted): 1984 2013

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMS2(-1)	-0.551951	0.237702	-2.322028	0.0287
D(LMS2(-1))	0.146354	0.215539	0.679011	0.5034
D(LMS2(-2))	-0.071220	0.202309	-0.352036	0.7278
C	1.643498	0.683761	2.403614	0.0240
@TREND("1981")	0.002486	0.015547	0.159914	0.8742

R-squared	0.276826	Mean dependent var	-0.001958
Adjusted R-squared	0.161118	S.D. dependent var	0.738242
S.E. of regression	0.676159	Akaike info criterion	2.206235
Sum squared resid	11.42978	Schwarz criterion	2.439768
Log likelihood	-28.09353	Hannan-Quinn criter.	2.280944
F-statistic	2.392460	Durbin-Watson stat	1.969340
Prob(F-statistic)	0.077607		

Null Hypothesis: D(LMS2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.153577	0.0143
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LMS2,2)

Method: Least Squares

Date: 01/12/16 Time: 12:34

Sample (adjusted): 1985 2013

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMS2(-1))	-1.735656	0.417870	-4.153577	0.0004
D(LMS2(-1),2)	0.525284	0.307137	1.710258	0.1001
D(LMS2(-2),2)	0.177928	0.205863	0.864304	0.3960
C	0.287162	0.341201	0.841619	0.4083
@TREND("1981")	-0.015376	0.017269	-0.890377	0.3821

R-squared	0.615856	Mean dependent var	-0.001709
Adjusted R-squared	0.551832	S.D. dependent var	1.118379
S.E. of regression	0.748703	Akaike info criterion	2.414637
Sum squared resid	13.45335	Schwarz criterion	2.650378
Log likelihood	-30.01224	Hannan-Quinn criter.	2.488468
F-statistic	9.619138	Durbin-Watson stat	2.107579
Prob(F-statistic)	0.000087		

Null Hypothesis: LCPS has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.458628	0.3447
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LCPS)

Method: Least Squares

Date: 01/12/16 Time: 12:39

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCPS(-1)	-0.245224	0.099740	-2.458628	0.0206
D(LCPS(-1))	0.352908	0.173672	2.032036	0.0521
C	0.542058	0.247767	2.187770	0.0375
@TREND("1981")	0.006226	0.003929	1.584636	0.1247

R-squared	0.246212	Mean dependent var	0.005156
Adjusted R-squared	0.162458	S.D. dependent var	0.197066
S.E. of regression	0.180350	Akaike info criterion	-0.467925
Sum squared resid	0.878202	Schwarz criterion	-0.282894
Log likelihood	11.25283	Hannan-Quinn criter.	-0.407609
F-statistic	2.939697	Durbin-Watson stat	2.076055
Prob(F-statistic)	0.051075		

Null Hypothesis: D(LCPS) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.226836	0.0115
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LCPS,2)

Method: Least Squares

Date: 01/12/16 Time: 12:41

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPS(-1))	-0.765955	0.181213	-4.226836	0.0002
C	-0.042452	0.075806	-0.560001	0.5799
@TREND("1981")	0.002637	0.003963	0.665541	0.5112

R-squared	0.389870	Mean dependent var	-0.006687
Adjusted R-squared	0.346289	S.D. dependent var	0.242323
S.E. of regression	0.195924	Akaike info criterion	-0.330412
Sum squared resid	1.074817	Schwarz criterion	-0.191639
Log likelihood	8.121382	Hannan-Quinn criter.	-0.285175
F-statistic	8.945930	Durbin-Watson stat	1.939866
Prob(F-statistic)	0.000991		

Null Hypothesis: LINT has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.809285	0.2044
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LINT)

Method: Least Squares

Date: 01/12/16 Time: 12:44

Sample (adjusted): 1982 2013

Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LINT(-1)	-0.318907	0.113519	-2.809285	0.0088
C	0.895003	0.295077	3.033118	0.0051
@TREND("1981")	-0.004453	0.004111	-1.083107	0.2877

R-squared	0.238274	Mean dependent var	0.021661
Adjusted R-squared	0.185741	S.D. dependent var	0.237980
S.E. of regression	0.214744	Akaike info criterion	-0.149679
Sum squared resid	1.337336	Schwarz criterion	-0.012266
Log likelihood	5.394865	Hannan-Quinn criter.	-0.104131
F-statistic	4.535711	Durbin-Watson stat	2.160750
Prob(F-statistic)	0.019323		

Null Hypothesis: D(LINT) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.509646	0.0000
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LINT,2)

Method: Least Squares

Date: 01/12/16 Time: 12:45

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LINT(-1))	-1.191952	0.183105	-6.509646	0.0000
C	0.087261	0.093985	0.928456	0.3611
@TREND("1981")	-0.004111	0.004871	-0.843969	0.4058

R-squared	0.602745	Mean dependent var	-0.009280
Adjusted R-squared	0.574370	S.D. dependent var	0.365801
S.E. of regression	0.238650	Akaike info criterion	0.064128
Sum squared resid	1.594706	Schwarz criterion	0.202901
Log likelihood	2.006021	Hannan-Quinn criter.	0.109364
F-statistic	21.24186	Durbin-Watson stat	2.086869
Prob(F-statistic)	0.000002		

Null Hypothesis: LREER has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.554950	0.3018
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LREER)

Method: Least Squares

Date: 01/12/16 Time: 12:46

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREER(-1)	-0.291675	0.114161	-2.554950	0.0166
D(LREER(-1))	0.382567	0.177121	2.159920	0.0398
C	1.457104	0.631543	2.307213	0.0289
@TREND("1981")	-0.005220	0.008255	-0.632301	0.5325

R-squared	0.258858	Mean dependent var	-0.033054
Adjusted R-squared	0.176509	S.D. dependent var	0.386919
S.E. of regression	0.351115	Akaike info criterion	0.864511
Sum squared resid	3.328615	Schwarz criterion	1.049541
Log likelihood	-9.399915	Hannan-Quinn criter.	0.924826
F-statistic	3.143424	Durbin-Watson stat	2.093060
Prob(F-statistic)	0.041453		

Null Hypothesis: D(LREER) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.179303	0.0128
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LREER,2)

Method: Least Squares

Date: 01/12/16 Time: 13:02

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LREER(-1))	-0.765461	0.183155	-4.179303	0.0003
C	-0.117881	0.150209	-0.784783	0.4392
@TREND("1981")	0.005463	0.007789	0.701383	0.4889

R-squared	0.384388	Mean dependent var	0.001244
Adjusted R-squared	0.340416	S.D. dependent var	0.473084
S.E. of regression	0.384214	Akaike info criterion	1.016532
Sum squared resid	4.133372	Schwarz criterion	1.155305
Log likelihood	-12.75624	Hannan-Quinn criter.	1.061768
F-statistic	8.741605	Durbin-Watson stat	1.949626
Prob(F-statistic)	0.001123		

Null Hypothesis: LGDP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.681334	0.7362
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.003209
HAC corrected variance (Bartlett kernel)	0.002652

Phillips-Perron Test Equation
Dependent Variable: D(LGDP)
Method: Least Squares
Date: 01/12/16 Time: 13:10
Sample (adjusted): 1982 2013
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.104128	0.061569	-1.691240	0.1015
C	0.603641	0.383239	1.575105	0.1261
@TREND("1981")	0.005146	0.001514	3.398762	0.0020

R-squared	0.294070	Mean dependent var	0.013597
Adjusted R-squared	0.245385	S.D. dependent var	0.068499
S.E. of regression	0.059504	Akaike info criterion	-2.716473
Sum squared resid	0.102682	Schwarz criterion	-2.579061
Log likelihood	46.46357	Hannan-Quinn criter.	-2.670925
F-statistic	6.040281	Durbin-Watson stat	1.876874
Prob(F-statistic)	0.006413		

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.995448	0.0018
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.003629
HAC corrected variance (Bartlett kernel)	0.002485

Phillips-Perron Test Equation
Dependent Variable: D(LGDP,2)
Method: Least Squares
Date: 01/12/16 Time: 13:12
Sample (adjusted): 1983 2013
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-0.948951	0.189305	-5.012821	0.0000
C	-0.041467	0.026141	-1.586267	0.1239
@TREND("1981")	0.003296	0.001445	2.280516	0.0304

R-squared	0.473090	Mean dependent var	0.002557
Adjusted R-squared	0.435453	S.D. dependent var	0.084364
S.E. of regression	0.063388	Akaike info criterion	-2.587319
Sum squared resid	0.112505	Schwarz criterion	-2.448546
Log likelihood	43.10345	Hannan-Quinn criter.	-2.542083
F-statistic	12.56999	Durbin-Watson stat	1.959013
Prob(F-statistic)	0.000127		

Null Hypothesis: LMS2 has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.092383	0.1251
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.370850
HAC corrected variance (Bartlett kernel)	0.349343

Phillips-Perron Test Equation
Dependent Variable: D(LMS2)
Method: Least Squares
Date: 01/12/16 Time: 13:13
Sample (adjusted): 1982 2013
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMS2(-1)	-0.497611	0.158409	-3.141303	0.0039
C	1.480024	0.472581	3.131785	0.0039
@TREND("1981")	0.002190	0.012823	0.170809	0.8656

R-squared	0.265831	Mean dependent var	0.025212
Adjusted R-squared	0.215199	S.D. dependent var	0.722097
S.E. of regression	0.639699	Akaike info criterion	2.033421
Sum squared resid	11.86721	Schwarz criterion	2.170833
Log likelihood	-29.53473	Hannan-Quinn criter.	2.078969
F-statistic	5.250218	Durbin-Watson stat	1.826203
Prob(F-statistic)	0.011325		

Null Hypothesis: D(LMS2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 30 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-14.23981	0.0000
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.502898
HAC corrected variance (Bartlett kernel)	0.027851

Phillips-Perron Test Equation
Dependent Variable: D(LMS2,2)
Method: Least Squares
Date: 01/12/16 Time: 13:14
Sample (adjusted): 1983 2013
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMS2(-1))	-1.114830	0.187185	-5.955774	0.0000
C	0.164070	0.289944	0.565869	0.5760
@TREND("1981")	-0.008806	0.015078	-0.584039	0.5639

R-squared	0.558903	Mean dependent var	-0.023246
Adjusted R-squared	0.527396	S.D. dependent var	1.085408
S.E. of regression	0.746177	Akaike info criterion	2.344057
Sum squared resid	15.58983	Schwarz criterion	2.482830
Log likelihood	-33.33288	Hannan-Quinn criter.	2.389293
F-statistic	17.73904	Durbin-Watson stat	2.080316
Prob(F-statistic)	0.000011		

Null Hypothesis: LCPS has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.664722	0.7434
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.033486
HAC corrected variance (Bartlett kernel)	0.032113

Phillips-Perron Test Equation
Dependent Variable: D(LCPS)
Method: Least Squares
Date: 01/12/16 Time: 13:16
Sample (adjusted): 1982 2013
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCPS(-1)	-0.171307	0.101162	-1.693399	0.1011
C	0.387569	0.252762	1.533337	0.1360
@TREND("1981")	0.004517	0.003956	1.141920	0.2628

R-squared	0.098847	Mean dependent var	0.010077
Adjusted R-squared	0.036698	S.D. dependent var	0.195850
S.E. of regression	0.192223	Akaike info criterion	-0.371265
Sum squared resid	1.071537	Schwarz criterion	-0.233852
Log likelihood	8.940244	Hannan-Quinn criter.	-0.325717
F-statistic	1.590496	Durbin-Watson stat	1.393952
Prob(F-statistic)	0.221095		

Null Hypothesis: D(LCPS) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 15 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.565339	0.0051
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.034672
HAC corrected variance (Bartlett kernel)	0.007681

Phillips-Perron Test Equation
Dependent Variable: D(LCPS,2)
Method: Least Squares
Date: 01/12/16 Time: 13:17
Sample (adjusted): 1983 2013
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPS(-1))	-0.765955	0.181213	-4.226836	0.0002
C	-0.042452	0.075806	-0.560001	0.5799
@TREND("1981")	0.002637	0.003963	0.665541	0.5112

R-squared	0.389870	Mean dependent var	-0.006687
Adjusted R-squared	0.346289	S.D. dependent var	0.242323
S.E. of regression	0.195924	Akaike info criterion	-0.330412
Sum squared resid	1.074817	Schwarz criterion	-0.191639
Log likelihood	8.121382	Hannan-Quinn criter.	-0.285175
F-statistic	8.945930	Durbin-Watson stat	1.939866
Prob(F-statistic)	0.000991		

Null Hypothesis: LINT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.751843	0.2242
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.041792
HAC corrected variance (Bartlett kernel)	0.032949

Phillips-Perron Test Equation
Dependent Variable: D(LINT)
Method: Least Squares
Date: 01/12/16 Time: 13:19
Sample (adjusted): 1982 2013
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LINT(-1)	-0.318907	0.113519	-2.809285	0.0088
C	0.895003	0.295077	3.033118	0.0051
@TREND("1981")	-0.004453	0.004111	-1.083107	0.2877

R-squared	0.238274	Mean dependent var	0.021661
Adjusted R-squared	0.185741	S.D. dependent var	0.237980
S.E. of regression	0.214744	Akaike info criterion	-0.149679
Sum squared resid	1.337336	Schwarz criterion	-0.012266
Log likelihood	5.394865	Hannan-Quinn criter.	-0.104131
F-statistic	4.535711	Durbin-Watson stat	2.160750
Prob(F-statistic)	0.019323		

Null Hypothesis: D(LINT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.509646	0.0000
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.051442
HAC corrected variance (Bartlett kernel)	0.051442

Phillips-Perron Test Equation
Dependent Variable: D(LINT,2)
Method: Least Squares
Date: 01/12/16 Time: 13:20
Sample (adjusted): 1983 2013
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LINT(-1))	-1.191952	0.183105	-6.509646	0.0000
C	0.087261	0.093985	0.928456	0.3611
@TREND("1981")	-0.004111	0.004871	-0.843969	0.4058

R-squared	0.602745	Mean dependent var	-0.009280
Adjusted R-squared	0.574370	S.D. dependent var	0.365801
S.E. of regression	0.238650	Akaike info criterion	0.064128
Sum squared resid	1.594706	Schwarz criterion	0.202901
Log likelihood	2.006021	Hannan-Quinn criter.	0.109364
F-statistic	21.24186	Durbin-Watson stat	2.086869
Prob(F-statistic)	0.000002		

Null Hypothesis: LREER has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.073085	0.5405
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.123957
HAC corrected variance (Bartlett kernel)	0.171435

Phillips-Perron Test Equation
Dependent Variable: D(LREER)
Method: Least Squares
Date: 01/12/16 Time: 13:21
Sample (adjusted): 1982 2013
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREER(-1)	-0.200518	0.112573	-1.781234	0.0854
C	0.953053	0.621544	1.533363	0.1360
@TREND("1981")	-0.001422	0.008180	-0.173833	0.8632

R-squared	0.117480	Mean dependent var	-0.031189
Adjusted R-squared	0.056616	S.D. dependent var	0.380774
S.E. of regression	0.369838	Akaike info criterion	0.937555
Sum squared resid	3.966619	Schwarz criterion	1.074968
Log likelihood	-12.00088	Hannan-Quinn criter.	0.983104
F-statistic	1.930219	Durbin-Watson stat	1.399185
Prob(F-statistic)	0.163308		

Null Hypothesis: D(LREER) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.998972	0.0194
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.133335
HAC corrected variance (Bartlett kernel)	0.076036

Phillips-Perron Test Equation
Dependent Variable: D(LREER,2)
Method: Least Squares
Date: 01/12/16 Time: 13:22
Sample (adjusted): 1983 2013
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LREER(-1))	-0.765461	0.183155	-4.179303	0.0003
C	-0.117881	0.150209	-0.784783	0.4392
@TREND("1981")	0.005463	0.007789	0.701383	0.4889

R-squared	0.384388	Mean dependent var	0.001244
Adjusted R-squared	0.340416	S.D. dependent var	0.473084
S.E. of regression	0.384214	Akaike info criterion	1.016532
Sum squared resid	4.133372	Schwarz criterion	1.155305
Log likelihood	-12.75624	Hannan-Quinn criter.	1.061768
F-statistic	8.741605	Durbin-Watson stat	1.949626
Prob(F-statistic)	0.001123		

APPENDIX II

LAG CRITERIA

VAR Lag Order Selection Criteria

Endogenous variables: LGDP LMS2 LCPS LINT LREER

Exogenous variables: C

Date: 01/12/16 Time: 13:34

Sample: 1981 2013

Included observations: 29

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-39.18614	NA	1.45e-05	3.047320	3.283061	3.121151
1	43.27658	130.8029*	2.84e-07*	-0.915626	0.498818*	-0.472640*
2	69.51734	32.57474	3.09e-07	-1.001196	1.591951	-0.189055
3	94.81325	22.67909	4.95e-07	-1.021603	2.750247	0.159693
4	127.9917	18.30533	9.63e-07	-1.585632*	3.364922	-0.035180

* indicates lag order selected by the criterion

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

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

CO-INTEGRATION TEST

Date: 01/12/16 Time: 13:47
Sample (adjusted): 1983 2013
Included observations: 31 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: LGDP LMS2 LCPS LINT LREER
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.787245	109.7567	88.80380	0.0007
At most 1	0.514868	61.78073	63.87610	0.0741
At most 2	0.488745	39.35734	42.91525	0.1085
At most 3	0.318799	18.55984	25.87211	0.3075
At most 4	0.193302	6.659002	12.51798	0.3814

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.787245	47.97598	38.33101	0.0029
At most 1	0.514868	22.42339	32.11832	0.4610
At most 2	0.488745	20.79750	25.82321	0.2006
At most 3	0.318799	11.90084	19.38704	0.4244
At most 4	0.193302	6.659002	12.51798	0.3814

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

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

LGDP	LMS2	LCPS	LINT	LREER	@TREND(82)
2.450588	-1.519063	-5.357455	-3.926272	-1.538592	0.013831
5.222669	-1.308533	1.650647	7.755423	1.127706	-0.046011
-6.033037	-2.123802	3.212146	-0.109443	-1.983921	0.022636
-1.496686	-0.061771	0.042931	-2.431023	0.402377	-0.068703
-6.548969	-0.296477	-0.133095	-1.198931	1.290720	0.198615

Unrestricted Adjustment Coefficients (alpha):

D(LGDP)	-0.005917	-0.010642	0.012859	-0.030663	0.011037
D(LMS2)	0.491885	0.187172	0.091447	-0.031162	0.024490
D(LCPS)	0.040163	-0.026112	-0.100992	-0.010054	0.014964
D(LINT)	0.074486	-0.083702	0.059312	0.066090	0.033587
D(LREER)	-0.035124	-0.094847	0.019196	-0.110483	-0.114259

1 Cointegrating Equation(s): Log likelihood 44.88821

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LMS2	LCPS	LINT	LREER	@TREND(82)
1.000000	-0.619877	-2.186192	-1.602176	-0.627846	0.005644
	(0.12600)	(0.27272)	(0.35481)	(0.13211)	(0.00747)

Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.014501
	(0.03221)
D(LMS2)	1.205408
	(0.19801)
D(LCPS)	0.098423
	(0.07766)
D(LINT)	0.182536
	(0.10232)
D(LREER)	-0.086074
	(0.17642)

2 Cointegrating Equation(s): Log likelihood 56.09990

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LMS2	LCPS	LINT	LREER	@TREND(82)
1.000000	0.000000	2.013555	3.579235	0.788332	-0.018615
		(0.44165)	(0.56175)	(0.18505)	(0.01209)
0.000000	1.000000	6.775131	8.358774	2.284613	-0.039135
		(0.98174)	(1.24869)	(0.41134)	(0.02687)

Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.070079	0.022914
	(0.07479)	(0.02599)
D(LMS2)	2.182944	-0.992125
	(0.41074)	(0.14275)
D(LCPS)	-0.037950	-0.026842
	(0.18022)	(0.06263)
D(LINT)	-0.254612	-0.003623
	(0.21979)	(0.07638)
D(LREER)	-0.581427	0.177465
	(0.40002)	(0.13902)

3 Cointegrating Equation(s): Log likelihood 66.49865

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LMS2	LCPS	LINT	LREER	@TREND(82)
1.000000	0.000000	0.000000	0.923517	0.272292	-0.006920
			(0.12434)	(0.06750)	(0.00443)
0.000000	1.000000	0.000000	-0.577081	0.548260	0.000216
			(0.28675)	(0.15566)	(0.01022)
0.000000	0.000000	1.000000	1.318920	0.256283	-0.005808
			(0.11906)	(0.06463)	(0.00424)

Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.147657	-0.004396	0.055440
	(0.10598)	(0.03708)	(0.08203)
D(LMS2)	1.631243	-1.186339	-2.032559
	(0.57352)	(0.20067)	(0.44391)
D(LCPS)	0.571337	0.187645	-0.582673
	(0.19593)	(0.06856)	(0.15166)
D(LINT)	-0.612446	-0.129591	-0.346700
	(0.30154)	(0.10550)	(0.23339)
D(LREER)	-0.697237	0.136697	0.093276
	(0.57788)	(0.20219)	(0.44729)

4 Cointegrating Equation(s): Log likelihood 72.44907

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LMS2	LCPS	LINT	LREER	@TREND(82)
1.000000	0.000000	0.000000	0.000000	0.946289	-0.070694
				(0.46858)	(0.03517)
0.000000	1.000000	0.000000	0.000000	0.127097	0.040066
				(0.30926)	(0.02321)

0.000000	0.000000	1.000000	0.000000	1.218851	-0.096887
				(0.66063)	(0.04958)
0.000000	0.000000	0.000000	1.000000	-0.729815	0.069055
				(0.49725)	(0.03732)

Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.101764	-0.002502	0.054124	0.013836	
	(0.09368)	(0.03227)	(0.07137)	(0.09971)	
D(LMS2)	1.677883	-1.184414	-2.033897	-0.413933	
	(0.58017)	(0.19985)	(0.44202)	(0.61754)	
D(LCPS)	0.586385	0.188266	-0.583104	-0.324704	
	(0.19830)	(0.06831)	(0.15108)	(0.21107)	
D(LINT)	-0.711361	-0.133673	-0.343863	-1.108755	
	(0.28418)	(0.09789)	(0.21651)	(0.30249)	
D(LREER)	-0.531879	0.143522	0.088533	-0.331185	
	(0.55507)	(0.19121)	(0.42290)	(0.59082)	

APPENDIX III

VECTOR ERROR CORRECTION MODEL

Dependent Variable: D(LGDP)

Method: Least Squares

Date: 01/12/16 Time: 14:17

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

D(LGDP) = C(1)*(LGDP(-1) - 0.50699937441*LMS2(-1) - 1.78900937367
*LCPS(-1) - 1.2407217085*LINT(-1) - 0.516659503316*LREER(-1) +
5.37911152391) + C(2)*D(LGDP(-1)) + C(3)*D(LMS2(-1)) + C(4)
*D(LCPS(-1)) + C(5)*D(LINT(-1)) + C(6)*D(LREER(-1)) + C(7)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.022843	0.039063	-0.584777	0.5642
C(2)	0.289637	0.206834	1.400332	0.1742
C(3)	-0.000804	0.020163	-0.039871	0.9685
C(4)	-0.078642	0.084170	-0.934322	0.3594
C(5)	-0.004680	0.062605	-0.074750	0.9410
C(6)	-0.010131	0.039807	-0.254500	0.8013
C(7)	0.012266	0.013590	0.902576	0.3757

R-squared	0.105172	Mean dependent var	0.015218
Adjusted R-squared	-0.118534	S.D. dependent var	0.069005
S.E. of regression	0.072980	Akaike info criterion	-2.201584
Sum squared resid	0.127826	Schwarz criterion	-1.877781
Log likelihood	41.12456	Hannan-Quinn criter.	-2.096033
F-statistic	0.470135	Durbin-Watson stat	2.044323
Prob(F-statistic)	0.823571		

SHORT RUN CAUSALITY TEST

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.039871	24	0.9685
F-statistic	0.001590	(1, 24)	0.9685
Chi-square	0.001590	1	0.9682

Null Hypothesis: C(3)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	-0.000804	0.020163

Restrictions are linear in coefficients.

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.934322	24	0.3594
F-statistic	0.872958	(1, 24)	0.3594
Chi-square	0.872958	1	0.3501

Null Hypothesis: C(4)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(4)	-0.078642	0.084170

Restrictions are linear in coefficients.

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.074750	24	0.9410
F-statistic	0.005588	(1, 24)	0.9410
Chi-square	0.005588	1	0.9404

Null Hypothesis: C(5)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(5)	-0.004680	0.062605

Restrictions are linear in coefficients.

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.254500	24	0.8013
F-statistic	0.064770	(1, 24)	0.8013
Chi-square	0.064770	1	0.7991

Null Hypothesis: C(6)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(6)	-0.010131	0.039807

Restrictions are linear in coefficients.

SERIAL CORRELATION TEST

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.220496	Prob. F(2,22)	0.8039
Obs*R-squared	0.609186	Prob. Chi-Square(2)	0.7374

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/12/16 Time: 14:46
Sample: 1983 2013
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.014529	0.046177	-0.314642	0.7560
C(2)	0.421067	1.009633	0.417050	0.6807
C(3)	0.005697	0.022550	0.252619	0.8029
C(4)	-0.010335	0.097332	-0.106185	0.9164
C(5)	0.004019	0.065411	0.061437	0.9516
C(6)	0.002896	0.041999	0.068945	0.9457
C(7)	-0.005572	0.019453	-0.286413	0.7772
RESID(-1)	-0.461247	1.046910	-0.440580	0.6638
RESID(-2)	0.029484	0.357814	0.082401	0.9351

R-squared	0.019651	Mean dependent var	4.64E-18
Adjusted R-squared	-0.336839	S.D. dependent var	0.065275
S.E. of regression	0.075472	Akaike info criterion	-2.092399
Sum squared resid	0.125314	Schwarz criterion	-1.676080
Log likelihood	41.43218	Hannan-Quinn criter.	-1.956689
F-statistic	0.055124	Durbin-Watson stat	1.985682
Prob(F-statistic)	0.999873		

HETEROSKEDASTICITY TEST

Heteroskedasticity Test: ARCH

F-statistic	0.125033	Prob. F(2,26)	0.8830
Obs*R-squared	0.276263	Prob. Chi-Square(2)	0.8710

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 01/12/16 Time: 16:07

Sample (adjusted): 1985 2013

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004210	0.002421	1.739243	0.0938
RESID^2(-1)	0.074963	0.195852	0.382752	0.7050
RESID^2(-2)	-0.068023	0.196377	-0.346390	0.7318

R-squared	0.009526	Mean dependent var	0.004231
Adjusted R-squared	-0.066664	S.D. dependent var	0.011070
S.E. of regression	0.011433	Akaike info criterion	-6.006879
Sum squared resid	0.003399	Schwarz criterion	-5.865434
Log likelihood	90.09974	Hannan-Quinn criter.	-5.962580
F-statistic	0.125033	Durbin-Watson stat	2.009349
Prob(F-statistic)	0.882995		