MONETARY POLICY AND PRICE STABILITY IN NIGERIA

(DECEMBER, 2006 THROUGH FEBRUARY, 2012)

BY

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Declaration

I hereby declare that the work in this thesis titled 'Monetary Policy and Price Stability (December, 2006 through February, 2012)' was performed by Abubakar Dalhatu of the Department of Economics under the supervision of Prof (Mrs.) P. S Aku and Dr. Peter Njiforti. The information derived from the literature has been duly acknowledged and a list of references provided. No part of this work has been published or presented for another degree here or another institution.

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Certification

This thesis titled 'Monetary Policy and Price Stability (December, 2006 through February, 2012)' meets the regulation governing the award of Master Degree of Science of the Department of Economics, Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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Dedication

This study has been dedicated to the Almighty Allah, who made what would have ordinarily be pre-empted as impossible, very possible and to the soul of my bereaved Daddy, Mal. Buba for his fatherly touch, ardent prayers and encouragement. My Daddy who had supported me throughout the program could not live long enough to witness its final completion because he passed on to the great beyond on Sunday, 26th August, 2012. Allahumma, agfir li'abi. Amen ya Allah.

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Abstract

This research work evaluates the responses of inflation, interest and exchange rate to shocks in Monetary Policy (captured by MPR) as well as the impacts of MPR on these Macroeconomic Variables. The study used monthly data spanning from December, 2006 (when the MPR was introduced) through February, 2012. Following Joao and Andrea (2006), the research used Structural VAR to estimate the model. The result shows that inflation responds to shocks in MPR only in a fairly unstable manner (a pattern that is almost unpredictable); in the first four periods, positive shocks in MPR could not bring down inflation but thereafter, any further increase in MPR produced gradually declining but positive rate of interest. On the other hand, exchange rate responds to shocks in MPR in a relatively downward fashion and quickly assumes upward trend from the second period lasting throughout the period, while interest rate, responds quickly and positively to shocks in MPR from the first thorough the last period.

Therefore, interest and exchange rates are more responsive to shocks in MPR than inflation and above all sometimes changes in MPR cannot guarantee the expected changes in Inflation (because of large informal sector as well as policy divergence between the monetary and fiscal authorities among other reasons). Hence, of all the three variables, inflation is the most difficult to deal with and stability of which is a necessary condition for the achievement of stability in the other two variables (interest & exchange rates). More so, interest and exchange rates as well as MPC meetings are better predictors of MPR (because of their high sensitivity to it) than the rate of inflation. The result also uncovered that as the most difficult enemy of the economy, inflation cannot be effectively and efficiently conquered with the variation in MPR alone, other instruments particularly Cash Reserve Requirement (CRR) and especially Open Market Operations (OMO) should be prudently used to compliment the efficacy of MPR. Consequently, the paper further recommends the current monetary tightening stance of CBN but should be used with caution, improvement and expansion of the cash-lite policy and non-interest banking of the CBN, infrastructural development, harmonization of fiscal and monetary policy as well as the reduction in the number of MPC meetings to at most quarterly unless in case of emergency.

TABLE OF CONTENT **PAGE**

1.1 Background of the Study ……..1

1.2 Problem Statement …… 2

1.3 Research Questions …… 4

1.4 Objectives of the Study ……. 4

1.5 Justification of the Study ..……. 5

1.6 Hypothesis ……. 6

1.7 Scope ….. ……..7

1.8 Limitations of Study ……..... 7

2.0 Literature Review …… 9

2.1 Conceptual Literature …….. 9

2.1.1 Overview of Inflation ……... 9

2.1.2 Monetary Policy and Inflation in Nigeria …….. 14

2.2.0 Overview of Exchange Rate …….. 15

2.2.1 Exchange Rate Management in Nigeria ……. 16

2.2.2 Problem with the Nigerian Exchange Rate System ……..... 17

2.2.3 Inflation and Exchange Rate …… 19

2.2.4 Monetary Policy and Exchange Rate ……19

2.3.0 Overview of Interest Rate . ……..20

2.3.1 Interest Rate Management . ……..21

2.3.2 Interest Rate Management Techniques ….……....22

2.3.3 Interest and Exchange Rates …….....22

2.3.4 Interest and Inflation ….……...23

2.3.5 Monetary Policy and Interest Rate ……....24

2.4.0 Inflation, Interest and Exchange rate (Macroeconomic) Stability …….... 24

2.4.1 Definition of very important Terminologies (VIT) …….……..... 26

2.5.0 Theoretical Literature …… 29

2.5.1 The Monetarist Theory..……...……..… 29

2.5.2 Keynesian Liquidity Theory of Interest ……...30

2.5.3 Purchasing Power Parity (PPP) Theory ……...33

2.5.4 Interest Rate Parity Theory …….. 34

2.6.0 Empirical Literature …..…… 34

3.1.0 Methodology; introduction …… 38

3.2.0 Sources of Data...……. 38

3.3.0 Model Specification.…… 38

3.4.0 Estimation Techniques…… 39

3.4.1 Unit Root Test……. 39

3.4.2 Granger Causality Test…….. 40

3.4.3 Impulse Response Function …… 40

3.4.4 Variance Decomposition ……. 41

4. 0.0 Analysis of the Result …… 42

4.1.0 Unit Root Test …… 42

4.2.0 Granger Causality Test …….. 42

4.3.0 Impulse Response Function …… 44

4.4.0 Variance Decomposition ……49

5.0.0 Summary, Conclusion and Recommendations……..…..... 51

5.1.0 Summary……..……..... 51

5.2.0 Outline of Findings……..…….……..... 51

5.3.0 Conclusion…….……... 52

5.4.0 Recommendation…..…….…….…… 52

5.5.0 Future Directions of Research ……. 54

Reference…….……..……55

LIST OF FIGURES

FIGURE 1: Determination of the Rate of interest…….....32

FIGURE 2: Impulse Response Function of Macroeconomic Variables to MPR ……..48

LIST OF TABLES

TABLE 1: Selected Macroeconomic Indicators ……. 18

TABLE 2: Result of Unit Root Test ……..…42

TABLE 3: Granger Causality Test ……..…44

TABLE 4: Variance Decompositions of MPR……. 50

LIST OF APPENDICES

Appendix 1: Lag Length Criteria …….……61

Appendix 2: Vector Autoregressive Estimates……..….....62

Appendix 3: Variance Decomposition of Macroeconomic Variables 63

Appendix 4: Macroeconomic Variables, Dec., 2006 to Feb., 2012……..... 65

Appendix 5: World Inflation Rates, Countries Comparison……..…….6

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Economic literatures vindicated that price stability could be achieved through monetary or fiscal policy or an appropriate combinations of the two (CBN, 2012; Idowu, 2010); fiscal policy is a policy under which the Government uses its expenditure and revenue programmes to produce desirable effects and avoid undesirable effects on the national income, production and employment; the Monetary policy on the other hand refers to the specific actions taken by the Central Bank to regulate the value, supply and cost of money in the economy with a view to achieving Government's macroeconomic objectives (CBN, 2012). For many countries like Nigeria, these objectives are explicitly stated in the laws establishing the central bank, while for others they are not. In Nigeria, the major objectives of monetary policy are the attainment of price stability and sustainable economic growth (Sanusi, 2012).

Associated objectives are those of full employment, stable long-term interest rates and real exchange rates. In pursuing these objectives, the CBN recognises the existence of conflicts among the objectives necessitating at some points some sort of trade-offs (Uchendu, 2010). The Bank manipulates the operational target (monetary policy rate, MPR) over which it has substantial direct control to influence the intermediate target (broad money supply, M2) which in turn impacts on the ultimate objective of price stability and sustainable economic growth (Okafor, 2009; Uchendu, 2009).

The Central Bank of Nigeria (CBN), like other central banks in developing countries, achieves the monetary policy goals through the amount of money supplied. Money supply comprises narrow and broad money. The definition of narrow money (M1) includes currency in circulation with non-bank public and demand deposits or current accounts in the banks. The broad money (M2) includes narrow money plus savings and time deposits, as well as

foreign denominated deposits (CBN, 2011). The broad money measures the total volume of money supply in the economy. Thus, excess money supply (or liquidity) may arise in the economy when the amount of broad money is over and above the level of total output. The need to regulate money supply is based on the knowledge that there is a stable relationship between the quantity of money supply and economic activity and that if its supply is not limited to what is required to support productive activities it will result in undesirable effects such as high prices or inflation (Sanusi, 2009; Soludo, 2009; CBN, 2010).

The Central Bank of Nigeria (CBN) derives its mandate from the CBN Act of 1958 and its subsequent amendments. In specific terms, part one, section one of the CBN Decree No. 24 of 1991, stipulates that the principal objects of the Bank shall be to: - Issue legal tender currency in Nigeria; maintain external reserves to safeguard the international value of the legal tender currency; promote monetary stability and a sound financial system in Nigeria, and Act as banker and financial adviser to the Federal Government (CBN, 2012).

1.2 Problem Statement

The primary objective of monetary policy is the achievement of price stability (Sanusi, 2012); however this may sound ambiguous because one may ask which price? Is it the price of Naira in relation to other currencies (i.e. exchange rate, which could be nominal or real effective), price of capital/reward for accumulating financial asset (i.e. interest rate, which could be deposit or lending rate), or the price of goods and services in the country {i.e. the general price level, which could be core or non-core inflation?}. Whichever price the CBN seeks to stabilize, there is no doubt monetary policy seeks to limit the growth of money supply to a level that is consistent with the desired level of output and prices (inflation, interest and exchange rates). Above all, empirical evidences have shown that it is only in the midst of stability in the general price level that sustained growth can be achieved (Olatunde, 2010).

However there seems to be no unanimity among economists as regards to the impact of monetary policy on these prices as well as how they respond to innovations in such a policy (Soludo, 2009).

Inflation in Nigeria has maintained a downward trend since February, 2010: it stood at 15.60 in February, 2010 but descended to a historic single digit of 9.40 & 9.30 in July and August, 2011 respectively but bounced back to a double digit of 11.90 in February, 2012. Regardless of whatever parameter used the inflation figure of 11. 90 (i.e. the figure as at the cut off of this research) is a double digit and any double digit inflation is considered high.

More so, inflation in Nigeria which stood at 11.90 as at February, 2012 was the 5th highest in the world and the second highest (next to Venezuela, with the world's highest inflation (of 24.60)) among the oil producers. Compare this with that of Ghana (8.6), South Africa (6.0), Saudi Arabia (5.4), Brazil (5.2), Malaysia (2.2), Morocco (1.6), Qatar (1.2) or Japan with the world lowest inflation rate of 0.30 as at February, 2012 (see appendix 5).

Inflation is very difficult to tackle largely because any meaningful attempt to curb it entails a trade-off among other important macroeconomic and social safety nets in the short run. As a monetary phenomenon, inflation cannot be sustained without accommodating increase in money supply but if money supply rises beyond the absorptive capacity of the economy, domestic prices will increase (Soludo, 2009). Despite this, the relative contribution of monetary policy to inflation is still a subject of debate (Nnanna, 2003).

Achievement of stable exchange rate in Nigeria (which is an open economy that depends heavily on oil exports for foreign exchange receipts and on imports for consumption and production of goods) has not been an easy task. The two exchange rate regimes (Fixed and Floating) have not yielded the optimum result, given that the rate which was relatively stable at N128.65/$ between February, 2006 to November, 2008 began to dwindle thereafter; it was N134/$ in December same year and now rose to N157.87/$ at WDAS in February, 2012

(CBN, 2012). The reasons attributable to that may include the fact that our economy is characterized by structural rigidities and bottlenecks; most of our imports and exports are characterized by inelasticity either on the demand or on the supply side or both. Additionally, the guidelines of the CBN on the purchases of foreign currency are often cumbersome, causing some frustrated potential foreign exchange users to patronize the parallel market. Expectedly, bi-weekly forex data revealed the existence of a gap between the demand and supply for foreign exchange in Nigeria (CBN, 2012).

Interest rate on the other hand, is a price and must be right and attractive to reward depositors and encourage long term savings as well as reward lenders. There exist conflicting and competing views regarding what constitute an appropriate interest rate depending on whose perspective – savers or lenders/borrowers (Soludo, 2008). However, there appear to be no much confusion that in most monetary policy regimes, interest rate is used as a policy instrument to achieve low inflation and stable exchange rate. For interest rate to fall on a sustained basis, inflation must fall and inflationary expectation must be low (Bergen, 2010). If CBN deliberately pushes interest rate low, the economy must be ready to live with a depreciated exchange rate. More so, if interest and exchange rates are controlled as we did in Nigeria between 1970 and 1980, then we should be prepared to live with any level of inflation rate that will result from such controls.

1.3 Research Questions

From the foregoing, the following research questions are germane;

a) How do interest rate, exchange rate and inflation respond to shocks in monetary policy rates (MPR)?
b) Is monetary policy rate (MPR) sufficient enough to bring about stability in inflation, interest & exchange rates?

1.4 **Objectives of the Study**

The General objective of the study is to find out the extent to which monetary policy (captured by MPR) could bring about Price Stability (stability in inflation, interest and exchange rates) in Nigeria. Consequently, the following is the specific objective of the study:

> To investigate how interest rate, exchange rate and inflation respond to shocks in monetary policy rate (MPR).

1.5 Justification for the Study

Inflation would not have been the attraction of this research if it has no reasonable influence on the standard of livings of Nigerians; more so, if policy measures so far adopted by Central Bank of Nigeria (CBN), from its inception in 1958 to date, have yielded the optimum result. Undoubtedly, inflation has not only continued to exist but remain a costly menace; it arbitrarily benefits debtors and hurts creditors by decreasing the real value of the outstanding debt; it is harmful to the general economy. It discourages savings and investment by creating uncertainty about future prices. It distorts relative prices and undermines the efficiency of the market pricing mechanism.

Moreover, Exchange rate would not have attracted attention in this research if it does not determine the relative prices of both domestic and foreign goods, the strength of the external sector, the demand for export and by extension the social welfare of Nigerians. The failure of Monetary Authorities to initiate and implement monetary policy that will stabilize exchange rate in favour of Nigeria and Nigerians is another justification for this study.

Furthermore, interest rate would have been neglected if not for its popular usage as an instrument for achieving stability in the two aforementioned rates. More importantly, interest rate would not have been an issue if it does not affect peoples' decision or behaviour with regards to consumption, savings and investment as well as profits that keep bourgeoisies in

business and above all determine the direction of funds (i.e. to where they can earn the highest return, or where loans can do the most for the economy). Above all, the need for the study would have been null and void, if CBN is able to produce (through its monetary policy) an interest rate that tells the truth about the availability of resources for meeting the present and future consumer demands, allowing production plans to be kept in line with the preferred patterns of consumption.

In an attempt to make contributions and possibly fill most or all of the vacuums identified above, various researches have been conducted. These researches in turn are equally not perfect; hence the gaps and/or deficiencies inherent in them necessitated this study.

First and foremost, a research titled "An assessment of the effect of money supply in Nigerian inflationary trend (1970-1993)", by one Omofa Moses Niyigbenga, a student of this department, can be considered narrow and deficient; it only succeeded in relating monetary policy with inflation holding the effects of interest and exchange rates constant. Consequently, by overlooking the role of interest rate as well as exchange rate on inflation and the monetary policy itself, the research in question needs to be improved and upgraded. The reason is that the two rates are so important to be easily overlooked when considering the influence of monetary policy. There is equally the need to update such a research to accommodate the effects of global financial meltdown, Euro-zone crises, Iranian and Libyan oil saga, partial removal of oil subsidy, development in monetary base as well as the monetary policy in general. This includes shift from direct to indirect monetary control and the change of nominal anchor from minimum rediscount rate (MRR) to monetary policy rate (MPR) just to mention but a few.

Similarly, another research on monetary policy and macroeconomic instability (1980-2000) by Emeka Nkoro is also inadequate because of non-inclusion of the same interest and exchange rates in his definition of macroeconomic instability in Nigeria. Thereby, making his

conclusion tight and constricted. Though a research captioned "Monetary policy and Macroeconomic instability; A rational expectation approach ($1980Q_1$-$2000Q_4$)" was more comprehensive, for defining macroeconomic instability to include fluctuations in both the inflation and interest rates, it is still weak and underprovided for neglecting interest rate. Hence the need to include interest rate in the model, so we can see if the conclusions obtained in the prevailing studies will still stand.

1.6 Hypotheses

The following hypotheses guided this study;

(1) H_0: Interest rate, exchange rate and inflation do not respond to shocks in monetary policy rate (MPR).

1.7 Scope of the Study

The study made use of monthly macroeconomic data in Nigeria to cover the period between December, 2006 and February, 2012 (a period of seventy five (75) months). This period is considered long enough to minimise the chances of committing either type I or type II errors while using the VAR model to achieve the targeted objectives.

Monetary policy rate (MPR), introduced in December, 2006 (which is the reason that informed the choice of December, 2006 as the leading period/month) will be used as a proxy to capture monetary policy in Nigeria. More so, for the long term interest rate, we used prime lending rate and the nominal effective exchange rate (NEER) figures were used to capture exchange rate while the headline inflation figures from National Bureau of Statistics was used for inflation in the research study.

1.8 Limitations of the Study

One of the major limitations of the study is the use of MPR as a proxy to capture monetary in Nigeria. In practice, CBN uses other instruments like OMO, Liquidity ratio and Cash reserve

Requirement to compliment variation in MPR in achieving Price Stability. The use of prime lending rate (excluding the maximum lending rate) for interest rate could also be a challenge toward producing the accurate and most reliable outcome. In a nutshell, there is likelihood that the research model has omitted some important explanatory variables.

Furthermore, the accuracy and the reliability of the data produced by NBS, CBN etc. used in this study cannot be guaranteed. Finally, the study might be seen as restrictive because any development (in the variables examined) before December, 2006 and after February, 2012 is considered to be beyond the scope of this study.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter is divided into three, the conceptual, theoretical and empirical literature; the conceptual literature break down in piece meals the key words in the study (monetary policy, inflation, interest and exchange rates) in addition to other important terminologies used in the research, the empirical literature reviews various researches that are considered germane to the research work. On the other hand, the theoretical literature, for the economy of time and space concentrates only on those economic theories that are deemed most appropriate for the study.

2.1 Conceptual Literature;

2.1.1 Overview of inflation

Inflation could be defined as an economic situation in which the increase in money supply is "faster" than the new production of goods and services in the economy (Hamilton, 2001). More often than not economists draw a line of difference between inflation and an economic condition of a onetime increase in price or when there are price increases in a narrow group of economic goods and services (Piano, 2001). Consequently, inflation signifies a general and persistent increase in the prices of goods and services in an economy (Ojo, 2000; Melberg, 1992).

Usually, the rate of Inflation is measured by the percentage change in the price index, which may be wholesale price index, producer price index, retail price index, or consumer price index. In Nigeria, inflation is measured as the percentage change in the consumer price index, which aggregates the price of a representative basket of goods and services purchased by the

average consumer, and obtained through periodic survey of consumer prices (CBN, 2005; Essien, 2002).

The National Bureau of Statistics has the statutory responsibility for compiling inflation statistics in Nigeria. Different weights are assigned to the goods in the representative consumer basket. As a result of these weights, changes in the prices of some goods in the basket exert varying effects on measured inflation. However, in this research work we used the headlines inflation used by CBN as against the consumer price index.

The year-on-year headline inflation was preferred because of the following disadvantages associated with the consumer price index (CPI) as a measure of the price levels; first it does not reflect goods and services bought by firms or government, such as machinery. Second, it does not reflect the changes in the quality of goods which might have occurred over time. Third, changes in the price of substitutable goods are not captured. Lastly, CPI basket usually does not change often. Inflation could also be measured by GDP deflator, though it is sparingly used because CPI represents the cost of living and is therefore more appropriate for measuring the welfare of the people.

As regards the causes of inflation; three school of thought stand out; the neo-Classical/monetarist, neo-Keynesian and structuralist. The neo-Classical/monetarists opine that inflation is driven mainly by growth in the quantum of money supply. However, practical experiences of the Federal Reserve in the United State (US) have shown that this may not be entirely correct. To buttress this, the US money supply growth rates increase faster than the price itself (Hamilton, 2001; Colander, 1995). This has been traced to the increased demand for the US dollar as a global trade currency (Mordi, C et al, 2007). On the other hand, the neo-Keynesians attribute inflation to diminishing returns of production. This occurs when there is an increase in the velocity of money and an excess current consumption over

investment. Finally, the structuralists postulate that inflation is caused by structural factors as well as the underlying characteristics of the economy (Adamson, 2000). Examples of these structural factors may include hoarding and hedging in Nigeria.

There are so many factors that affect inflation but the most popular ones could be narrowed down to institutional, fiscal, monetary and balance of payments. Several studies (Melberg, 1992; Cukierman, Webb and Neyapti, 1992; Grilli, et al, 1991; Alesina and Summers, 1993; Posen, 1993; Pollard, 1993, Debelle and Fischer, 1995 as well as Wikipedia, 2010) have shown that the level of independence (legal, administrative, instrument, etc.) of the monetary authority is an important institutional factor that determines inflation, especially in industrialised countries, while the rate of turnover of Central Bank Governors in developing countries was seen as an important factor influencing inflation. However, caution must be exercised in the interpretation of these findings, given the difficulty in measuring the actual level of independence of a central bank (CBN, 2009).

On the other hand, the fiscal factors have to do with the financing of budget deficits, largely through money creation process. The notion held here is that inflation is the result of large fiscal imbalances, arising from inefficient revenue collection procedures and limited development of the financial markets, which tend to increase the reliance on seigniorage as a source of deficit financing (Agenor and Hoffmaister, 1997 and Essien, 2005). The monetary factors or demand side determinants include increases in the level of money supply in excess of domestic demand, monetization of oil receipts, interest rates, real income and exchange rate (Moser, 1995). Prudent monetary management was also found to aid the reduction in the level and variability in inflation (Alesina and Summers, 1993). The supply side factors, popularly addressed as the balance of payment factors on the other extreme have to do with the effects of exchange rate movement on the price level. For instance, exchange rate

devaluation/depreciation induces higher import prices, external shocks and accentuates inflationary expectations (Melberg, 1992; Odusola and Akinlo; and Essien, 2005).

The neo-Keynesian economists identified the existence of three major types of inflation; demand pull, cost push and the structural inflation. Demand pull inflation (also known as the Philips curve inflation) occurs when aggregate demand is in excess of available supply (capacity) (Mordi, et al, 2007). The output gap could be as a result of increases in government purchases, increase in foreign price level, or increase in money supply. On the other end the cost push inflation (also addressed as the commodity or supply shock inflation) occurs when there is a sudden decrease in aggregate supply, as a result of an increase in the price/cost of the commodity/production where there are no suitable alternatives (Thomas, 2006). This type of inflation is becoming more common today than before, as evident in the rising prices of housing, energy and food. It is often reflected in price/wage spirals in firms, where workers try to keep up their wages with the changes in the price level and employers pass on the burden of higher costs to consumers through increase in prices. To wrap this up, the structural inflation is the built-in inflation, usually induced by changes in monetary policy (Mordi, et al, 2007).

Moreover, inflationary episodes can be characterized as low, moderate, high, extreme and hyper. Low inflation refers to a single-digit inflation rate (from 1-2 to 5%), while moderate inflation refers to double digit rates of 15 to 30 per cent, high inflation is in the 30-100 percentage range and extreme inflation ranges between 100- 1000 per cent. Hyperinflation refers to three digit inflation, episodes of more than 1000 per cent annual inflation rate. Last but not the least, any inflation below zero, is regarded as deflation (Vegh, 1992 and Piana, 2001).

Apart from extreme and hyperinflations, Nigeria had since independence in 1960 witnessed most of the known episodes of inflation, ranging from single-digit to moderate and high inflations;

a) The period before the oil price shock in 1973 witnessed a relatively low inflation rate with an average annual inflation rate year-on-year of 4.8%;

b) The period between 1973 and the National Economic Emergency Programme in 1985; this period was characterized by high inflation, the figure rose from 18.5% in 1993 to 43.5% in 1975 and 38.8% in 1983. This is not unconnected with the general wage increase in 1975 for workers in the public sector with arrears from April, 1974 (i.e. Udoji Award as popularly addressed), the oil price shock in that same 1975 as well as huge fiscal expenditure by the government as a result of oil revenue windfall.

c) The Structural Adjustment Programme (SAP) period (1986 to 1998); this is another period of high inflation. The economy was deregulated following the introduction of SAP. The resulting deregulation of key prices including the exchange and interest rates generated a pass through to domestic prices, pushing the rate of inflation from 13.7% in 1986 to 61.2% in 1988 and 48.8% in 1992 and back to 61.2% in 1998. The average annual inflation rate during this period was 30.8%.

d) The period of economic reforms 1999 to date. The inflation rate has been moderate between 14.5% in 2000 to 12.1% in 2002, 10% in 2004 and 11.9% as at February, 2012. This development is not unconnected with the limitation of government financing of its deficits through Ways and Means Advances by the CBN, the implementation of budget benchmark oil price rule with the creation of excess crude oil account, recapitalization of the banking sector as well as further liberalization of foreign exchange market, with the introduction of

Wholesale Dutch Auction (WDAS), among others (FOS, 2012; CBN, 2012 and Sanusi, 2012).

2.1.2 Monetary Policy and Inflation in Nigeria

Nigeria's monetary policy experiences could be divided into two broad policy regimes: The direct method of control (1960-1993) and the indirect control (1993-date). The direct control method was characterized by quantitative ceilings on credits, administered interest and exchange rates, aggregate/sectoral allocation of credits and stabilization securities. Under this regime the economy was divided into preferred sector and the less preferred sector and banks were required to allocate a given proportion of their credits to different sectors. The rationale was to moderate aggregate demand by controlling the volume and cost of credit that goes into the economy. Key instruments used include: administrative fixing of the minimum rediscount rate (MRR), cash reserve requirements, liquidity ratio, stabilization securities and transfer of federal government's (including ministries and parastatals) deposits to and from the central bank. Monetary management using direct controls faced a number of constraints which led to repressed financial market (Sanusi, 2009).

Indirect method of control employs market-based instruments and requires some levels of market infrastructural development to be effective. It relies on the power of monetary authorities to influence the availability and rate of return on financial assets. Two broad regimes could be identified during the indirect method of monetary management viz: indirect control under the pre-consolidation era (1993-2005) and indirect control during the post-consolidation era (2006-date). Instruments used under this regime include open market operation (OMO) through use of the Nigerian Treasury Bills (NTB) and Certificates, CBN Bills and Special NTBs, reserve requirements, liquidity ratios and movement of government deposits to and fro CBN (Okafor, 2009; Uchendu, 2009 and Sanusi, 2009).

A new framework for monetary policy implementation was introduced in December 2006 to enable CBN leverage on the success of the banking system consolidation. Elements of the new framework included the introduction of the Monetary Policy Rate (MPR) to replace the MRR, and a standing lending and deposit facility. Instruments under the new framework included, Open Market Operations, Repurchase Transaction (repo and reverse repo), Expanded Discount Window operations (EDW), Cash reserve requirements (averaging system) and Foreign exchange swap.

The strategy was to control the aggregate demand through the control of interest rates and money supply. Higher interest rates reduced aggregate demand in the following ways: discouraging borrowing by firms and households, increasing the rate of savings (the opportunity cost of spending), Business investments may also fall as the cost of borrowing increases. Some planned investment projects may also become unprofitable thus leading to a fall in aggregate demand. Higher interest rates could also reduce the demand for lending and, therefore, reduce the growth of broad money (reduce monetary inflation).

2.2.0 Overview of Exchange Rate

Exchange rate is the price of one currency expressed in terms of another, and it is of crucial importance to companies selling goods abroad. When the exchange rate rises (for example, when the Naira rises from $1.50 to $1.70), this makes exporters' goods *priced in naira* more expensive in foreign currency. Such a rise in the price of exported goods leads to a drop in export demand, and so in total demand in the economy, reducing inflationary pressure. Thus, a rising exchange rate *tends* to put downward pressure on inflation, often helping to lead to lower base rates. Conversely, a *fall* in the exchange rate will typically boost export demand, and so put upward pressure on both inflation and interest rates. Moreover, a rise in Naira exchange rate will tend to make imports into Nigeria cheaper, by boosting its purchasing

power in foreign currency terms. This reduces costs for manufacturers and consumers. This is a second channel through which a rising Naira puts downward pressure on inflation. Similarly, a fall in exchange rate makes imports more expensive, putting upward pressure on demand, inflation, and interest rates (Wikipedia, 2012).

Exchange rate helps in ensuring international exchange of goods and services as well as achieving and maintaining international competitiveness and hence ensures viable Balance of Payment position. Exchange rate serves as an anchor for domestic prices and contributes to internal balance in price stability. The general objectives of foreign exchange policy in Nigeria are basically the same as those of economic policy. The specific short and medium-term identifiable objectives include: To narrow the gap between the official and parallel markets and prevent disequilibrium in the foreign exchange market; ensure stability and sustainability of the exchange rate; maintain a favourable external reserve position and ensure external balance without compromising the need for internal balance, while keeping in view the overall goal of sustainable output, growth and employment; reduction of dependence on imports and oil exports; diversification of the export base; elimination or reduction of incidence of capital flight as well as correcting the sky rocketing Naira exchange rate (Idika, 1999; Akinlo, 2007).

We have four major mechanisms for managing/ determining exchange rate (Exchange rate management).These are;

Monetary unification /integration with other nations e.g., the EU. Here, the power to issue currency is surrendered to the supernatural body and member countries are usually made to align their economies to meet the set conditions, i.e., convergence test.

Fixed Exchange Rate system: In a fixed rate regime, the government sets the rate at which the currency will exchange for other currencies. The currency is supported by the government and is usually protected with Exchange Controls. Nigeria practiced this in the 1980s. The

assumption here is that market failure exists and the forces of demand and supply cannot be trusted to effectively allocate resources in ways that best promote the stated economic objectives. Forex is believed to be scarce and must be carefully utilized.

Freely floating rate system: Here the external value of the national currency is left to be determined exclusively by the forces of demand and supply. If demand for the country's currency (represented by the demand for its exports by other nationals) is high, its price (exchange rate) must be high. The reverse holds if the supply of the national currency (which is mirrored by demand for imports of the residents of importing country) is relatively high, the currency will be cheap.

Floating Exchange Rate system within set limits or boundaries (dirty float): Here, the government sets the exchange rate with upper and lower limits. Under this situation, the government sets the exchange rate, but allows some degree of flexibility for rate adjustment. Therefore, the dirty float system tries to combine the features of both fixed and floating exchange rate regimes (Elumelu, 2002).

2.2.1 Exchange Rate Management in Nigeria

Before the introduction of the Structural Adjustment Programme (SAP) in 1986, the country operated a fixed exchange rate regime based on trade and exchange controls, which was anchored through import license controls regime. Between 1986 and 1995, different exchange rate management regimes were introduced by the various governments in power at the time, including a dual exchange rate regime in 1988, the Interbank Foreign Exchange Market [IFEM] in 1989 and the reintroduction of a dual exchange rate system in 1995. Over this period, the demand for foreign exchange outstripped supply progressively. The existence of different foreign exchange markets in Nigeria is primarily born out of the inadequate supply of foreign exchange. In order to crowd out some requests for foreign exchange, the

monetary authorities scrutinize requests to differentiate between productive (genuine) and frivolous demands. Unmet demands are met at the parallel market. The pressure on the daily Inter-Bank Foreign Exchange Market has continued to be on the increase and this has resulted in the instability of the Naira exchange rate, while the gap between the official and the parallel markets continues to widen (Gotrin, 2010).

2.2.2 Problems with the Nigerian Exchange Rate System

A critical requirement for a freely floating exchange rate regime is the absence of any form of economic rigidity. The Nigerian economy is characterized by structural rigidities and bottlenecks. Most of our exports and imports are characterised by inelasticity either on the demand or supply side or both. More so, there exist a restraint on the free flow of goods and services by our trading partners. Above all the guidelines of CBN on the purchase of foreign currency are often cumbersome, causing some frustrated potential foreign exchange users to patronize the parallel market. Consequently, there is always a gap between supply and demand for foreign exchange. The Nigerian economy is import dependent. Thus, pressure on forex demand will inevitably create the alternative market, hence different rates. Non-oil export is under-reported and proceeds are hardly repatriated into the country, thus compounding the supply rigidity (Jason, 2010).

A review of financial statistics from the World Bank reveals that the real sector (consisting Agriculture, Manufacturing, Building & Construction, Mining and Quarrying) of Nigeria's economy has been the worse for Nigeria's Interest and Exchange Rate Management Experiences. Between 1993 and 1999, the manufacturing sector contributed less than 8% of GDP at 1984 constant factor cost. Interest rates on 2 years' government bonds, corporate bonds and 90 days' money market instruments is at least 4 times higher in Nigeria than in most developed countries of the world (including the G-8 countries). This was not

unconnected with lack of good basic amenities like power and roads that contributed to high cost of doing business in Nigeria. On the other hand, GNP in absolute terms and per capita is lower in Nigeria than in some third world countries such as India, Malaysia, Egypt, Indonesia, South Africa and Israel, to name a few. Even against some African countries, Nigeria's GNP Per Capita is one of the lowest, despite a relatively high GNP. With a GNP per head of US$292, the average Nigerian falls below the international poverty line of US$300 as approved by UNDP. This corroborates the World Bank position that Nigeria's per capital income is currently below the threshold of the Highly Indebted Poor Countries [HIPC]. In general, the macroeconomic indicators reveal that between 1995 and 1999, GDP growth rate was below 4%, industrial capacity utilization was below 40% and change in the exchange rate was as high as 92.8% in 1999. In the external sector, insufficient supply of foreign exchange continues to mount pressures on Nigeria's exchange rate (Elumelu, 2002).

The stringent documentation requirements in the official market crowds out some forex demands that are ultimately met in the parallel or black market. Thriving malpractices in the parallel market and the documentation requirements of the official market have both contrived to make patronage of the former increasingly attractive and profitable, further discouraging domestic production and worsening Nigeria's balance of payment position. The Nigerian macro economy is therefore, characterized by structural rigidities, dualism and the false paradigm model. Generally, the sectors of the economy are in silos to the extent that the primary sector does not relate meaningfully with the secondary sector and the same for the secondary and the tertiary sectors. It is clear that Nigeria is in dire need of rapid and sustainable rate of economic growth and development, if we are to reduce the level of human miseries pervading the country (Elumelu, 2002; Jason, 2010 and Sanusi, 2010).

Table 1: Selected Macroeconomic Indicators

Indicator	2005	2006	2007	2008	2009	2010	2011
Real GDP Growth Rate	6.51	6.0	6.5	6.4	6.7	7.87	7.69
Inflation (year on Year)	17.9	8.5	6.6	15.1	12.0	11.8	10.3
Growth in M_2	13.6	30.6	44.2	58.0	17.1	6.9	15.4
FDI(US$ Billions)	4.98	13.9	5.6	5.8	n/a	13.46	34.18
External reserves (US$ billions)	28.3	42.3	51.3	53.0	42.4	32.34	32.64
Exchange rate (end period)	132.15	128.2	117.9	132.5	149.6	152.32	158.21
External debt(US$B)	2.0	3.5	3.6	3.7	3.9	31.97	33.12

Source: CBN Annual Report and Statement of Accounts Various Issues

2.2.3 Inflation and Exchange Rate

As a general rule, a country with a consistently lower inflation rate exhibits a rising currency value, as its purchasing power increases relative to other currencies. During the last half of the twentieth century, the countries with low inflation included Japan, Germany and Switzerland, while the U.S. and Canada achieved low inflation only later. Those countries with higher inflation typically see depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates (Jason, 2010)

2.2.4 Monetary policy and Exchange Rate

Between 1960 and 1973, monetary policy framework in Nigeria centred on exchange rate targeting. The primary objective of this framework was to promote price stability as a sound basis for sustainable economic growth. The frame was broken into regimes and incorporates

several features of the basket, band and crawling peg regimes. First, the Naira was managed against a basket of currencies of its major trading partners. The various currencies were assigned different weights, depending on Nigeria's extent of trade relationship. Second, the CBN operated the Inter-bank Foreign Exchange market (IFEM) which was conducted as a managed float.

Later, the Dutch Auction System was introduced where the exchange rate of the Naira was determined by auctioning and the clearing rate determined the exchange rate. This system contained both features of managed float and crawling peg. In 2005, the exchange rate policy allowed the exchange rate to fluctuate with a policy band of (+/- 3). The band provided a mechanism to accommodate short-term fluctuations in the foreign exchange market and flexibility in managing the exchange rate.

The Retail Dutch Auction System was changed to Whole Sale Dutch Auction System (WDAS) in February 2006. The success of the consolidation exercise provided the muscle for WDAS as the threat of insolvency of deposit money banks had been drastically reduced and payment system became more efficient. In January 2009, CBN reintroduced the RDAS and back to WDAS in July 2009.

Additionally, it should be noted that in theory, 'optimal' inflation rate has to be greater than zero. But determining the 'right' rate for a particular economy at any point in time is a complicated issue. In practice, low inflation of 2-3% has been the norms for developed countries and 5-7% for developing countries. Contrariwise, high level of inflation promotes uncertainty, discourages savings and investment. On the other hand, excessively low inflation tends to cause cyclical downturns that last unnecessarily longer. Hence, a little inflation may make it easier for firms to reduce real wages necessary to maintain employment during economic downturns. Consequently, it could be deduced that at very low level of inflation,

nominal interest rate would also be low, limiting the central bank's ability to ease policy in case economic activity experiences a downturn. Therefore, low and stable inflation is the best contribution monetary policy can make to the efficient allocation of resources, economic development and growth (Soludo, 2009).

2.3.0 Overview of Interest Rate

Interest rate is a reward for accumulating financial assets and foregoing current consumption, which influences the willingness to save (deposit rate). It is also a cost of capital, which influences the demand for loanable funds by different types of borrowers (lending rate); it generally affects peoples' decision or behaviour with respect to consumption, saving and investment; it is a signal that directs funds to where they can earn the highest returns, or to where loans can do the most for the economy (Soludo, 2008).

Interest rates are regarded as "high" or "low" relative to some economic fundamentals, namely: the level of inflation rate, the degree of uncertainty and risks economic agents face, how developed and deep financial markets are, the structure of the banking system (how competitive it is), the cost of funds to the banks (including deposit rates) as well as the demand for credit by government (i.e. when it runs deficit and whether it competes with the private sector) (Peter, 2001; Elgar, 2006).

There are conflicting and competing views about what constitutes an appropriate interest rate depending on whose perspective it is (i.e. savers or lenders/borrowers). Generally, interest rates are prices and must be right and attractive to reward depositors and encourage long term savings as well as reward lenders and that long-term savings can only occur when inflation is tamed (Soludo 2008 & 2009 and Sanusi, 2009).

The following factors influence interest rate in Nigeria;

Inflation Expectation: If the rate of inflation is expected to increase, the nominal interest rate needs to be sufficiently high to induce positive real interest rates, so that there is an incentive for savings. Similarly, lenders/savers will want to be compensated for inflation and will push the nominal interest rate up to get the desired real rate of interest.

Volume of Savings: Higher volumes of savings drive down interest rate and promote investment. Conversely, lower volume increases interest rate and lowers investment. The domestic interest rates, in conjunction with the rate of return on foreign financial assets, and the expected change in exchange rate determine the allocation of accumulated savings among domestic financial assets, foreign assets and goods that are hedged against inflation. Raising the levels of long-term savings is therefore vital for achieving the desired level of interest rates as well as sustaining high investment and output growth.

Fiscal Deficits: Government fiscal deficits financed by the banking system crowd-out the private sector. Real interest rates rise as the government attracts funds away from the private sector. High interest rate has the effect of reducing the private sector's demand for capital. Government fiscal deficit as a percentage of GDP in Nigeria has dropped significantly, averaging less than 1% in the last three years.

Risk Profiles: Borrowers'(including sectoral) risk profile and the pricing of risks by the DMBs play an important role in determining the level of interest rates charged by banks. Where a borrower/sector or project is assessed to be high risk, a higher than "normal "nominal interest rate is charged. This explains why some customers are charged a higher interest rate than others under similar conditions (Soludo, 2008 & 2009).

2.3.1 Interest Rate Management

Interest rate management refers to the totality of steps and processes designed and used by the monetary authorities (the CBN) to determine, sustain or support the level of interest rates in an economy in ways that engender the achievement of macroeconomic stability. It needs to also ensure that rates do not fall to levels where the liquidity trap ensnares the economy (Liquidity trap is the level of interest rate below which further reductions will not impact on the level of economic activities/national income) (Elumelu, 2002).

2.4.2 Interest Rate Management Techniques

Administrative Fiat: Nigeria practiced this in pre-SAP era. The regulatory authorities relied exclusively on the use of direct controls to regulate the economy. The apex bank fixed interest and other banking charges. Monetary aggregates were fixed by a combination of both direct and indirect measures. The regulatory authorities set the maximum rate by which credit could be expanded. Allocation to the different sectors was also fixed by the body. Credit expansion was strictly controlled by the monetary authorities and sectoral allocation of credit was prescribed to favour the preferred economic sectors.

It promotes stability since the rates are seldom changed while the monetary authorities resolve to defend the monetary aggregates creates a high level of credibility.

However, it leads to inefficient use of capital input, due to the artificially low cost of commercial credit resulting in inappropriate pricing of credit and deposits, acute scarcity of loanable funds in the system (because banks would prefer to invest their funds in Treasury Bills than lend below their average cost of funds) and lastly low level of capital formation for economic development.

Free Market Determination: this involves the deregulation of interest rates and abolition of sectoral allocation. Nigeria is currently using this technique. Under this technique, the regulators only set the rules and allow the operators to play according to their dictates within the rules. Another important element of this technique is the licensing of more banks so as to increase the depth and intensity of competition in the industry. However, another important element of deregulation is that the pricing of deposit and credits is left for the banks and their customers. Borrowers will not pay an interest higher than the Marginal Productivity of capital (MPC). Depositors demand and interest rate are high enough to compensate them for postponing their consumption and cover risks of value associated with inflation. The most popular interest rate management techniques in Nigeria are, the use of regular open market operations, manipulations of rediscount rate, cash reserve ratio and liquidity ratio (Elumelu, 2002: Gotrin, 2010).

2.3.3 Interest and Exchange rates

Changes in exchange rates can have knock-on implications for interest rates because of their effects on inflation. In the same vein, changes in interest rates can themselves *feed back* into exchange rates, so there is often a complex relationship between the two. Conventional assumptions suggest that an increase in interest rates will tend to raise the exchange rate, and vice versa. Higher interest rates boost returns on Nigerian assets, attracting inflows of funds from overseas and this rise in demand for Naira can push up the price (in other words, the exchange rate of Naira). In the real world, however, things are more complicated. In some circumstances, a rise in interest rates can lead to a *fall* in the exchange rate, and vice versa. For instance, if the increase in interest rate makes investors to worry about growth prospects and to move their funds elsewhere, the exchange rate can drop (Stanley, 2010).

2.3.4 Interest and inflation

Interest and inflation are keys to investment decisions, since they have direct impact on the investment yield. When prices rise, the same unit of a currency is able to buy less. A sustained deterioration in the purchasing power of money is called inflation. Investors aim to preserve the value of their money by opting for investments that generate yields higher than the rate of inflation. In most developed economies, banks try to keep the interest rates on savings accounts equal to the inflation rate. However, when inflation rate rises, companies or governments issuing debt instruments would need to lure investors with a higher interest rate (Wikipedia, 2012).

Monetary Authorities use the interest rate to control money supply and, consequently, the inflation rate. When interest rates are high, it becomes more expensive to borrow money and savings become attractive. When interest rates are low, banks are able to lend more, resulting in an increased supply of money. Alteration in the rate of interest can be used to control inflation by controlling the supply of money in the following ways.

A high interest rate influences spending patterns and shifts consumers and businesses from borrowing to saving mode. This influences money supply. A rise in interest rates boosts the return on savings in building societies and banks. Low interest rates encourage investments in shares. Thus, the rate of interest can impact the holding of particular assets. A rise in the interest rate in a particular country fuels the inflow of funds. Investors with funds in other countries now see investment in this country as a more profitable option than before. Inflation has a significant impact on the time value of money (TVM). Changes in the inflation rate (whether anticipated or actual) result in changes in the rates of interest. Banks and companies anticipate the erosion of the value of money due to inflation over the term of the debt instruments they offer. To compensate for this loss, they increase the interest rates. The

central bank of a country alters interest rates with the broader purpose of stabilizing the national economy. Investors need to keep a close watch on interest and inflation to ensure that the value of their money increases over time (Wikipedia, 2012).

2.3.5 Monetary Policy and Interest Rate;

To begin with let us bear in mind that the economy is a wheel with money as the gas, monetary policy is the power of the government to control the flow of money in its society. When interest rates are high, the tendency of people is to control their spending and as much as possible stay away from borrowing money. This in turn slows down the movement of money in society. So one strategy the government employs is to lower the interest rates, to attract people to borrow money and spend them on projects or businesses. Who among us would not suddenly think of purchasing houses, cars or expansion of current businesses when very low interest rates prevail? Such interest rates would make you think your money will earn more by investing it where yields are higher.

When the economy is in danger of overheating (when growth is too fast, threatening a rise in inflation), the government increases interest rates to make access to excess money more expensive and arrest spending. Normally, such policies are implemented by a central bank that has more influence with creditors such as banks and other financial institutions. The main reason that governments undertake such measures is to spur or to impede the economic growth through introduction of the monetary policy. Interest rates become a tool to help manage the economy.

In effect, the monetary policy can be gleaned to be tied up with interest rates. However, just as stated earlier, there are a lot of macroeconomic factors that affect interest rates. Inflation,

supply and demand for money and other general economic indicators are normally related to one another, which in turn dictates which interest rate to peg (Michael, 2010).

2.4.0 Inflation, Interest and Exchange Rate (Price) Stability

The exchange rate and interest rate can be kept low and stable only if we succeed in keeping inflation low and stable over time (Sanusi, 2012). If the Central Bank artificially keeps the interest rate low, the economy must be prepared to live with a depreciated exchange rate. In most monetary policy regimes, interest rate is used as a policy instrument while low Inflation and stable exchange rates are the policy objectives. Interest rate could be varied to fight inflation and positive real interest rate is the norm. For interest rate to fall on sustained basis inflation must fall and inflationary expectations must be low. If interest rate and exchange rate are controlled as we did in Nigeria in 1970s-80s, then we should be prepared to live with any level of inflation outcome that will result from such controls (Soludo, 2009). Hence, the conclusions that can be drawn are as follows:

Under a high inflation environment, a low nominal interest rate regime is not only inconsistent but is also not feasible, as creditors would demand a high interest rate to compensate them for parting with their funds and the erosion of the purchasing power induced by the high inflation. In such circumstances, the policymaker desirous of achieving low and stable inflation (price stability) will be compelled to raise its base policy rate to: Signal a tight monetary policy stance, influence (drive-up) market interest rates to constrain aggregate demand (through lower consumption and investment spending) and ultimately lower inflation. Over time, this outcome will expectedly elicit a lower interest rate regime when all adjustments must have taken place (MPC, 2012).

A low interest rate regime in an environment of high inflation leads to an inefficient use/allocation of financial resources, as "sub-optimal" investments which do not promote economic growth will be undertaken. Furthermore, a high inflation environment is inconsistent with a "strong" and stable currency. In an open economy such as Nigeria, a high domestic price level (high inflation) relative to those of the trading partners accompanied by a highly appreciated domestic currency vis-à-vis trading partners' currencies will (i) Diminish the country's competitiveness in the international market. (ii) Discourage exports (in Nigeria's case, non-oil exports). (iii) Encourage imports. (iv) Discourage foreign investment, portfolio and other inflows. (v) Encourage capital outflows (vi) Encourage foreign exchange arbitraging and emergence of a thriving parallel market for foreign exchange and (vii) Deplete external reserves.

Thus, in order to ameliorate such adverse developments, the policymakers desirous of bringing sanity to the economic system will deploy the instruments available to it, such as pursuing an interest rate policy that will significantly moderate inflation, encourage domestic savings, encourage capital inflows and mitigate capital outflows. Thus, there is an inherent trade-off in trying to strike an appropriate balance among the three key price variables—interest rate, exchange rate and inflation rate (Soludo, 2009).

Hence, the necessary and sufficient conditions for the achievement of low and stable exchange and interest rates in Nigeria are; Stable and low inflation rate, a diversified productive and export base as well as political stability (fighting Boko Haram insurgency, Militancy in Niger Delta, Armed Robbery on our roads etc.) which will enhance the supply of foreign exchange as well as improving business environment and productivity. We equally need to improve the physical and social infrastructure of the economy which would reduce the cost of doing business. Fiscal prudence must be practised by the 3-tiers of government

and full implementation of the Fiscal Responsibility Act. Banks must also improve their operational efficiency by limiting their over-head cost.

Before drawing the curtains of our discussion in this segment it is paramount we define the following very important terminologies:

Prime lending rate and maximum lending rate: Prime lending rate is interest rate charged by banks on big time customers, who are judged to be highly credit worthy, while the maximum lending rate is rates charge on other risky customers, who are judged to have higher risk of default. Usually, the prime lending rate is always lower than the maximum lending rate, so as to reflect on the riskiness of the respective borrowers.

IB call rate and Open buy back: Interbank (IB) call rate is the rate of interest that banks pay each other for lending over short period (sometime over night in the money market). It is call money because banks have the right to call their money at any time. **Open Buy Back**, OBB, is a money market instrument used to raise short term capital in the Nigerian money market. It is a form of borrowing using Nigerian Government Securities as collateral. It is an open ended transaction with both parties maintaining the right of liquidation or a roll-over without prior notice within trading hours of the day. An OBB transaction is usually sealed between dealers of different banks and settlement is made at Central Bank where bills are transferred from the borrower's bills holding to the lenders bills portfolio. On the other hand, funds equivalent to the face value of the treasury bills is moved from the account of the lender to the borrower's current account with the Central Bank of Nigeria. This product offers flexibility, but with interest rate and bank stability risk. It is a product for short-term liquidity. OBB offers the benefits of Treasury Bills (counts as liquid asset) while removing the rediscounting risk associated with carrying Treasury Bills.

Year on Year and Core inflation: year on year inflation is the rate of inflation calculated from a price index over one year. It is calculated as (X2/X1-1)*100; where x2 is CPI in the current year, X1 is CPI at the end of the corresponding period of last year. **Core inflation** is the inflation rate that does not consider food items. It is inflation calculated on the core real sectors of the economy but the food subsector.

Currency swaps (or foreign exchange swap) is a FX agreement between 2 parties to exchange a set amount of 1 currency for another and, after a certain specified period of time, to give back the original amounts that swapped. Currency swaps can be negotiated for various types of maturities of up to thirty years. Unlike back-to-back loans, financial swaps are not considered to be a loan by US accounting laws and thus it isn't reflected on a firm's balance sheet. A swap is seen as a short leg foreign exchange transaction plus a far leg as the obligation to close the swaps from being a forward contract.

Basis Point: A unit that is equal to 1/100th of 1%, and is used to denote the change in a financial instrument. The basis point is commonly used for calculating changes in interest rates, equity indexes and the yield of a fixed-income security.

Open Market Operation (OMO) is the sale or purchase of government or other eligible securities thereby altering the reserve base of banks and their credit creating capacities, aggregate demand and the general level of economic activity.

Liquidity ratio: this is the proportion between a bank or other financial institution's holdings of liquid asset and total liabilities. Currently, CBN pegs minimum liquidity ratio at 30%.

Cash Reserve Ratio (CRR): it is the minimum ratio of cash holding to total liabilities of banks or other financial institutions. CRR is supposed to guard against the collapse of such

institutions due to lack of confidence in their ability to pay deposit. CRR in Nigeria is currently 8%.

Fiscal Responsibility Act: An Act that provides for prudent management of the Nation's Resources, ensure Long-Term Macro-Economic stability of the National Economy, secure greater accountability and transparency in Fiscal operations within the Medium Term Fiscal Policy Framework, and the establishment if the Fiscal Responsibility Commission to ensure the promotion and enforcement of the Nation's Economic objectives; and for related matters.

Nominal Effective Exchange Rate: The unadjusted weighted average value of a country's currency relative to all major currencies being traded within an index or pool of currencies. The weights are determined by the importance a home country places on all other currencies traded within the pool, as measured by the balance of trade:

Real Effective Exchange Rate: The weighted average of a country's currency relative to an index or basket of other major currencies adjusted for the effects of inflation. The weights are determined by comparing the relative trade balances, in terms of one country's currency, with each other country within the index.

Real and Nominal Interest Rates: In Economics, **nominal interest rate** or **nominal rate of interest** refers to the rate of interest before adjustment for inflation (in contrast with the real interest rate); or, for interest rates "as stated" without adjustment for the full effect of compounding (also referred to as the **nominal annual rate**). More so, an interest rate is called *nominal* if the frequency of compounding (e.g. a month) is not identical to the *basic time unit* (normally a year). The real interest rate on the other hand, is the nominal rate of interest minus inflation. In the case of a loan, it is this real interest that the lender receives as income. If the lender is receiving 8 percent from a loan and inflation is 8 percent, then the real rate of interest is zero because nominal interest and inflation are equal. A lender would

have no net benefit from such a loan because inflation fully diminishes the value of the loan's profit.

Rediscount Rate: The act of discounting a short-term negotiable debt instrument for a second time. Banks may rediscount these short-term debt securities to assist the movement of a market that has a high demand for loans. When there is low liquidity in the market, banks can generate cash by rediscounting short-term securities. Consequently, the central bank's discount facility is often called a discount window. The term comes from the days when a clerk would go to a window at the central bank to rediscount a company's securities.

Time value of money (TVM): this is the value of money figuring in a given amount of interest earned over a given amount of time. The time value of money is the central concept in **finance theory.** For example, N100 of today's money invested for one year and earning 5% interest will be worth N105 after one year. Therefore, N100 paid now or N105 paid exactly one year from now both have the same value to the recipient who assumes 5% interest; using **time value of money terminology**, N100 invested for one year at 5% interest has a *future value* of N105.

Repurchase and reverse Repurchase (Repo & reverse-Repo) Transactions: These are two types of OMO; in a repurchase transaction, the CBN uses repurchase makes collateralized loans to primary dealers. In a reverse repo or "RRP", the CBN borrows money from primary dealers. The typical term of these operations is overnight, but the CBN can conduct these operations with terms out to 65 business days. The CBN uses these two types of transactions to offset temporary swings in bank reserves; a repo temporarily adds reserve balances to the banking system, while reverse repos temporarily drains balances from the system.

The standing lending facility (SLF) & Standing Deposit Facility (SDF); SLF is available as an overnight lending to banks with deficits, at a fixed interest rate, i.e. the upper band of the CBN standing facility. The CBN stands ready to supply any amount the banks may require at the lending rate. The Central Bank also set up a standing Deposit facility that pays banks with surplus funds, a fixed interest rate in their deposit or reserves which they keep with the Bank. This arrangement allows the Bank to keep the overnight inter-bank interest rate in between the corridor with an upper and lower limit on interest rate.

Monetary Policy Committee (MPC): this is the highest monetary policy making body of CBN, it's a twelve member committee and meets every other month to review the domestic economy as well as other international happenings that are likely to have impact on the Nigerian economy.

2.5.0 Theoretical Literature

2.5.1 The Monetarist Theory

The monetarists, following the quantity theory of money (QTM), have propounded that the quantity of money is the main determinant of the price level, or the value of money, such that any change in the quantity of money produces an exactly direct and proportionate change in the price level. The QTM is traceable to Irving Fisher's famous equation of exchange;

$$MV = PQ \quad \ldots\ldots (1)$$

Where M stands for the stock of money; V the velocity of circulation of money; Q the volume of transactions which take place within the given period; while P stands for the general price level in the economy. Transforming the equation by substituting Y (total

amount of goods and services exchanged for money) for Q, the equation of exchange becomes;

$$MV = PY \quad \text{..... (2)}$$

The introduction of Y provides the linkage between the monetary and the real side of the economy. In this framework however, P, V and Y are endogenously determined within the system. The variable M is the policy variable, which is exogenously determined by the monetary authorities. The monetarists emphasised that any change in the quantity of money affect only the price level or the monetary side of the economy, with the real sector of the economy totally insulated. This indicates that changes in the supply of money do not affect the real output of goods and services, but their values or the prices at which they are exchanged only. An essential feature of the monetarist model is its focus on the long- run supply-side properties of the economy as opposed to the short run dynamics.

Nevertheless, the model's general weakness is found in its inadequacy to explain general price movement. The truism of direct proportion between change in the quantity of money and change in the price level cannot be accepted in today's world (as there are other factors involved such as infrastructural and structural factors). Moreover, it is technically inconsistent to multiply two non-comparable factors as M relates to a point of time (static concept) and V to a period of time (dynamic concept). Furthermore, the velocity of circulation is highly unstable and would change with variation in the stock of money or money income. Thus, it is unrealistic to assume V to be constant and independent of M. More importantly it has been criticised for neglecting short run factors, such as expectation; Lucas opined that only unanticipated changes of money supply generate price variation that economic agents misconstrue as relative price movements, which leads to price and output increase.

The QTM also gives undue importance to price level as if it is the most important phenomenon of economic system, overlooking factors like interest rate as one of the causative factors between money and prices (Mordi et al, 2007; Jinghan, 2002). Despite these deficiencies, the theory could still be used to analyse inflation in relation to monetary policy (See Salisu, 1993). The general message of the theory is that increase in money supply is the causal factor of inflation and hence reduction in money supply will tackle the menace of inflation.

2.5.2 Keynesian Liquidity theory of interest rate

According to this theory, the rate of interest is determined by the demand for and the supply of money. The theory is therefore characterised as the monetary theory of interest, as distinct from the real theory of the classical. The supply of money according to the theory is the total quantity of money in the country for all purposes at any time. Though, the supply of money is a function of the rate of interest to a degree, yet it is considered to be fixed by the monetary authority, that is the supply curve of money is taken as perfectly inelastic.

On the other end, demand for money (addressed as liquidity preference) is the desire to hold cash. The money in cash "lulls disquietude" and the rate of interest which is demanded in exchange for it is a" measure of degree of disquietude". The rate of interest in Keynes's word is the premium which has to be offered to induce people to hold their wealth in some form other than hoarded money. The higher the liquidity preference, the higher the interest rate that will have to be paid to the holders of cash to induce them to part with their liquid assets. The lower the liquidity preference, the lower will be the rate of interest that will be paid to cash holders. According to Keynes, there are three motives behind the desire of the people to hold liquid cash; these are; transactionary, precautionary and speculative motives;

Transactionary motive; this relates to the needs to hold cash balances to meet current transactions of personal and business exchanges. It is further divided into the income and business motive. The income motive is meant to bridge the interval between the receipt of income and its disbursement, while the business motive is to bridge the gap between the time of incurring business cost and the time of the receipt of the sale proceeds. Hence transactionary demand depends on the level of income, employment and prices, the business turnover, the normal period between the receipt and disbursement of income, amount of salary or income and on the possibility of getting a loan.

Precautionary motive; this relates to provide for contingencies requiring sudden expenditures and for unforeseen opportunities of advantageous purchases. Both individuals and businessmen keep cash in reserves to meet unexpected needs. Individuals hold some cash to provide for illness, accident, unemployment and other unforeseen contingencies. Similarly, businessmen keep cash in reserves to tide over unfavourable conditions or to gain from unexpected deals. Money held for precautionary motive is rather like water kept in reserve in water tank. It depends upon the level of income, business activity, opportunities for unexpected profitable deals, availability of cash, the cost of holding liquid asset in bank reserves, etc.

Keynes holds that transactionary 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 of (L_1) of the level of income (Y) and is expressed as $M = L_1(Y)$.

Speculative motive; money is held here for securing profit from knowing better than the market what the future will bring forth. Individuals and businessmen have funds, after keeping enough for transactionary and precautionary purposes, like to gain by investing in bonds. Money held for speculative purposes is a liquid store of value which can be invested

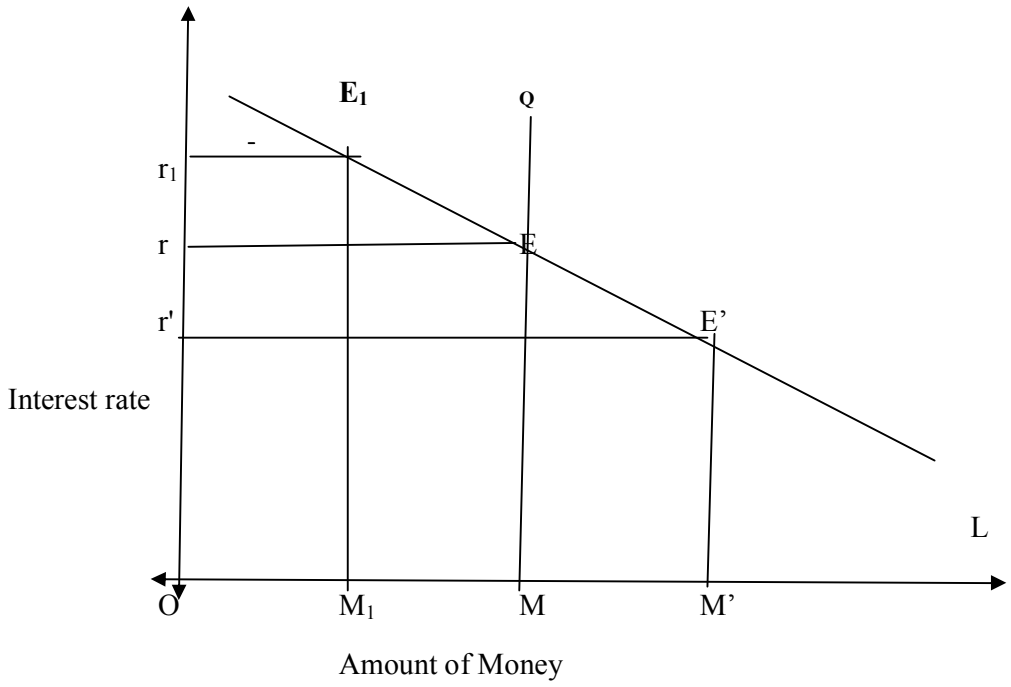
at an opportune moment in interest bearing bond or securities. The speculative demand for money is therefore a decreasing function of the rate of interest to the matter of expectation about a safe future rate of interest. The higher the rate of interest the lower the speculative demand for money and vice versa.

Algebraically, Keynes expressed the speculative demand for money as $M_2 = L_2(r)$, where L_2 is the speculative demand for money and r is the rate of interest. Consequently, the total demand for money (M) {which is $M_1 + M_2$} can be expressed as; $M = L(Y, r)$. So, M_1 is the active or circulating money and M_2 is the idle or passive money. Though M_1 is a function of income and M_2 of the rate of interest yet they cannot be held in water tight compartments. Even M_1 is interest elastic at high interest rates. If there is increased demand for M_1 it can be met by transferring funds from idle balances, M_2.

Having, analysed the factors behind the supply and demand for money, Keynes argue that interest rate, like the price of any product or service is determined geometrically at a point where the demand for and the supply of money are equal. In the Figure 1 below it is denoted by E (both intersect at E), it is the point where the equilibrium rate of interest is established. If there is any deviation from this equilibrium an adjustment will take place via the rate of interest, and the equibrium level E, is re-established. For example, if the supply of money is increased by the monetary authorities, but the liquidity preference remains the same, the rate of interest will fall to the point of liquidity trap; thereafter further increase in money supply will not affect the rate of interest (Jhingan, 2002).

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Figure 1; Determination of the rate of interest



However, the theory has been vigorously criticised by Hansen, Robertson et al, as a college bursar's theory, at best an inadequate and at worst a misleading account and a pre classical, mercantilist, and a man in the street economics. This is because of its deficiencies such as the wrong notion of liquidity trap, assumption that only money held for speculative purposes is fruitful while money held as a store of value is barren, as well as the assumption that the demand for money is mainly associated with the liquidity preference for the speculative motive to which the rate of interest is brought directly into touch. In spite of this and many others, the theory is still the closest one can use to relate monetary policy and interest rate.

2.5.3 The Purchasing Power Parity (PPP) Theory

This theory states that the rate of exchange of a currency can be explained in terms of the purchasing power of the domestic currency. In essence, the theory attempts to establish a close relationship between the rate of inflation and the exchange rate of a currency. The theory argues that a high rate of inflation will lead to depreciation in exchange rate (i.e. a

depreciated currency) and vice versa (Idika, 1998). In its absolute version, the purchasing power parity of different currencies is equalized for a given basket of goods. In the relative version, the difference in the rate of change in prices at home and abroad (the difference in the inflation rates) is equal to the percentage depreciation or appreciation of the exchange rate. PPP exchange rate (the real exchange rate) fluctuations are mostly due to different rates of inflation between the two economies. Aside from this volatility, consistent deviations of the market and PPP exchange rate are observed, for example (market exchange rate) prices of non-traded goods and services are usually lower where incomes are lower. (A U.S. dollar exchanged and spent in Nigeria will buy more cotton than a dollar spent in the United States). Basically, PPP deduces exchange rates between currencies by finding goods available for purchases in both currencies and comparing the total cost for those goods in each currency (Wikipedia, 2010).

However, there can be marked differences between PPP and the market exchange rates. For example, the World Bank's World Development Indicators 2005 estimated that in 2003. One Geary-Khamis dollar was equivalent to about 1.8 Chinese Yuan by purchasing power parity (PPP) (considerably different from the nominal exchange rate). This discrepancy has large implications; for instance, GDP per capita in India is about US$1,100 while on a PPP basis is about US$3,000. This is frequently, used to assert that India is the world's fourth- largest economy, but such a calculation would only be valid under the PPP theory, at nominal exchange rate its economy is only the eleventh largest (Wikipedia, 2010). However, this weakness is not enough to prevent us from using it to have an insight about the relationship between inflation and exchange rate.

2.5.4 The Interest Rate Parity Theory

According to this theory, the difference in the rate of interest in two countries should be able to explain the exchange value of the currencies of the two countries. Thus, if a country is experiencing high interest rate regime, there is a strong tendency for the exchange rate of its domestic currency to be high as well, depicting that the domestic currency has depreciated in value against foreign ones. Therefore, there exist some form of linear relationship between the interest and the exchange rate operatives in any domestic economy. If interest rates are low, the exchange value of the domestic currency vis-a-vis foreign ones will be low (an appreciation) while the reverse will be the case if interest rates are high (a depreciated local currency results). In effect, differences in the interest rate structure between two economies will give an indication of what their exchange rates would be like. The interest rate parity theory is arguing that the rate of interest is an important factor influencing the rate of exchange of a local currency vis-a-vis a foreign one (Idika, 1998).

Nonetheless, the main argument against the interest rate parity theory is for its non-arbitrage condition; which says that the returns from borrowing in one currency, exchanging that currency for another currency and investing in interest-bearing instruments of the second currency, while simultaneously purchasing futures contracts to convert the currency back at the end of the holding period, should be equal to the returns from purchasing and holding similar interest-bearing instruments of the first currency. If the returns are different, an arbitrage transaction could, in theory, produce a risk-free return (Wikipedia, 2010). Upon all these the theory could still be adopted to have an insight about the possible relation between interest and exchange rates.

2.6.0 Empirical Literature

Quite a number of researches have been conducted world over on monetary policy and macroeconomic variables and how these variables respond to shocks in monetary policy. Few of these researches are considered relevant and hence reviewed here under;

Joao and Andrea (2006) developed an international monetary aggregate for US, Euro, Japan, UK and Canada to examine its indicator properties for global output and inflation. Applying a structural VAR approach, the two scholars established that after a monetary policy shock, output decline temporarily with the downward effect reaching its pinnacle within the second year, and the global monetary aggregate drops significantly. More so, the price level rises permanently in response to a positive in the global liquidity aggregate.

Oliver and Thepthida (2005) used a general equilibrium model to discover that real exchange rate fluctuations arise from two sources: changes in the relative price of traded goods, and movement in the relative price of traded to non-traded goods across countries. In their conclusion, they maintained that the introduction of non-traded goods would not alter the predictive powers of monetary shocks because the presence of non-traded goods magnifies the response of the deviation from the law of one price.

Canova (2005) established that a US monetary shock has a strong impact on macroeconomic development in US. Owing to a US contractionary monetary policy shock, interest rates are found to rise, which attracts capital inflows and pushes aggregate demand up, and down.

Chuku (2009) used a structural vector auto regressive model with quarterly data from 1986:1 to 2008:4 to measure the effects of monetary policy innovations in Nigeria. Variables used in his model were: real gross domestic product (GDP), consumer price index (CPI), broad money (M2), minimum rediscount rate (MRR) and real effective exchange rate (REER). His study discovered that monetary policy innovations carried out on innovations on the price-based nominal anchors (MRR and REER) had neutral and fleeting effects on output. While

the quantity-based nominal anchor (M2) had modest effects on output and prices with a very fast speed of adjustment implying that the quantity of money (M2) in the economy is the most influential instrument for monetary policy implementation in Nigeria.

Cheng (2007) examined the impact of a monetary policy shock on output, prices, and the nominal effective exchange rate for Kenya using quarterly data from 1997–2005 with economic variables: real GDP and prices, money stock, short-term interest rates, and the nominal effective exchange rate. Based on the vector auto regression technique, the main results suggested that an exogenous increase in the short-term interest rate tends to be followed by a decline in prices and appreciation in the nominal exchange rate, but had insignificant impact on output. His key finding showed that, variations in the short-term interest rates accounted for significant fluctuations in the nominal exchange rate and prices, while accounting little for output fluctuations.

Salisu (1993) using OLS to investigate the role of interest rate in the determination of the demand real cash balances, concluded that there existed no significant relationship between the duo, and that any attempt by the policy makers of the Nigerian Economy to influence this kind of money demand through the use of interest rate will not yield any positive result.

Omofa (19**) using the Quantity Theory of money (QTM) established a positive but not significant relationship between money supply and price level. This means that though money supply contributes to price determination in Nigeria, it is not the major causal factor. Other variables of significance are price level lagged and exchange rate. They are both positively related to current price level and their coefficients are both high and significant. Moreover, Nkoro (2005) on a topic monetary policy and macroeconomic instability in Nigeria (1980-2000) concluded that factors responsible for excess liquidity and inflationary pressure in Nigeria included; instability of the financial sector, which was attributed to bank

distress and lack of managerial efficiency, resulting to financial institution failures, non-harmonization of fiscal and monetary policies and increase in government expenditure.

Folawewo and Osinubi (2006) used rational expectation approach to conclude that the effort of Monetary Authority in Nigeria at using its credit and reserves as monetary tools in checking inflation and the rate of exchange has affected the volatility of the two variables over the years. Thus monetary policy, if not well targeted could yield negative results. This is because the speculations of the private agents may frustrate monetary effort (Berg and Pattillo, 1999), just as improper inflation targeting could affect real exchange rate volatility (Amato and Gerlach, 2002) and exchange rate intervention induce inflation (Galati, 2000). Thus monetary policy should be set in such a way that the objective it set to achieve is well defined, in a way that effort at stabilizing exchange rate will not generate inflation and vice versa.

Additionally, several studies (Idowu, 2010; Uchendu, 2009; Okafor, 2009 and Nkoro, 2005) have established that huge public spending has constrained the efficacy of monetary policy in Nigeria. They buttressed that huge public spending by the three tiers of government, over the years, had hampered monetary management resulting in the missing of monetary targets by wide margins, while inducing serious pressure on the general price level. Moreover, the poor state of economic infrastructure, resulting from past neglect, influence monetary management adversely.

CHAPTER THREE: METHODOLOGY

3.1.0 Introduction

Monetary policy actions are transmitted through a series of connections among macroeconomic variables. For this reason VAR models have been a popular framework for the study of monetary policy in recent years, as they are able to embody the interaction between the conduct of monetary policy and the economy without ascribing to a particular theoretical model (Mies and Tapia, 2003). VAR effectively captures linkages among macroeconomic variables since it is a dynamic system that permits simultaneity of activities among included variables. In other words, the variables in the system express themselves freely at the same time and the impulse response function serves to trace out the actions due to each variable in the entire system (Mbutor: 2009). To be specific, we strictly, implored Structural Autoregressive (SVAR) model to achieve the objective of the study. The choice of SVAR was informed by its ability to allow modeling non-recursive structures of the economy with a parsimonious set of variables and above all it facilitates the interpretation of the contemporaneous correlations among disturbances (Joao and Andrew, 2006)

3.2.0 Sources of Data

The study made use of data mainly from secondary sources, particularly unpublished data from the research as well as monetary policy departments of CBN. We equally used data from the published works in CBN official websites, Statistical Bulletins, monthly journals, financial reviews as well as annual Reports and various Communiqués of the monetary policy committee meetings. Another source of data for the study included statistics and published materials by the National Bureau of statistics (NBS), Nigerian Economic Society, newspapers, magazines, journals, seminar papers as well as my previous lecture notes and

similar studies conducted in the department. The variables involved in the study are monetary policy rate (i), market rate of interest (l), inflation rate (In), and exchange rate (x).

3.3.0 Model Specification

The specification model for the vector of endogenous variable, Y_t includes i_t, In_t, x_t is represented in a SVAR model founded by Granger's (1969) specification of causality and endogeniety. Thus, we consider the standard form of our VAR model with lag order *p* as:

$$Y_t = C_0 + \sum_{i=1}^{p} A_i Y_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Y_t represents the vector of endogenous variables, C_o is a vector of constants; A_i denotes the matrices of autoregressive coefficients and ε_t is a vector of white noise processes. According to Anguyo (2008) identification of the structural shocks is achieved through the appropriate ordering of the variables of interest and applying Choleski decomposition to the variance covariance matrix of the reduced form residualsε_t. In estimating the standard SVAR model depicted in (1) above, the variables must be stationary.

The model which seeks to explain the effects of monetary policy innovations on endogenous variables is a simple unrestricted SVAR model (adopted from Joao and Andrea, 2006) written as:

$$Y_t = AY_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots 2$$

Y is a vector of endogenous variables and A is a matrix of polynomials in the lag operator and ε_t is a vector of random errors.

The above variables must be stationery in order to run SVAR; if not this might lead to spurious regressions. Hence Augmented Dickey fuller and Phillip Peron test were conducted

to establish the absence of a unit root while, the Akaike information (AIC) and Schwarz Criteria (SC) were used to determine the appropriate lag order.

3.4.0 Estimation Technique

3.4.1 Unit Root Test

The empirical analysis started by checking the time series properties of the variables using the Augmented Dickey Fuller (ADF) test to establish the order of stationarity. This became necessary in order to avoid the incidence of spurious regression estimates. The test involved estimation of the following regression equation given in (4) bellow.

$$\Delta x_t = \alpha + \beta t + \delta x_{t-1} + \Sigma \Delta x_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Where, x in the above equation is the variable under consideration. Thus, the ADF unit root test states that $H_o : \beta = 0$ and $H_1 : \beta < 0$, where the ADF statistics was compared with the observed Mackinnon critical values.

3.4.2 Granger Causality Test

At the level of theory bringing out the evidence of the causal relationship between economic variables furnish us with elements of reflexion and better understanding of economic phenomena. In a practical, the "causal knowledge" is necessary to formulate correct economic policies (Bourbonnais 2002). Granger (1996) proposed the concepts of causality and exogeneity: a variable Y_t is said to cause X_t, if the predicted value of X_t is ameliorated when information related to Y_t is incorporated in the analysis. This is translated as follows,

$$Y_t = \sum_{i=1}^{n} \alpha_i X_{t-i} + \sum_{j}^{n} \beta_j Y_{t-j} + \varepsilon_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

$$X_t = \sum_{i=1}^{n} \gamma_i X_{t-i} + \sum_{j=1}^{n} \delta_i Y_{t-j} + \varepsilon_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

If the set of X and Y coefficients are statistically different from zero, then there exists bilateral causation. On the other hand, unilateral causation occur when only one of the coefficients is significant (i.e. X causing Y or vice versa) and absence of causation exists if both coefficients are not significant.

3.4.3 Impulse Response Function

A shock to a particular variable may not only directly affect the variable but is also transmitted to all of the other endogenous variables. An impulse-response function traces the effect of a one-time shock to one of the innovations on the current and future values of the endogenous variables. The impulse-response, therefore, tells us how macro variables respond to innovations in monetary policy rates. In order words, an impulse-response will be applied to trace the reactions of interest rate, inflation and exchange rate to innovations in monetary policy rates in Nigeria. Equation 3 explains the response in question;

$$\begin{pmatrix} l_t \\ x_t \\ Im_t \\ i_t \end{pmatrix} = A_1 \begin{pmatrix} l_{t-1} \\ x_{t-1} \\ Im_{t\ \ 1} \\ i_{t-1} \end{pmatrix} + \ldots + + A_p \begin{pmatrix} l_{t-p} \\ x_{t-p} \\ Im_{t\ \ p} \\ i_{t-p} \end{pmatrix} \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{pmatrix} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Where $\square_t$ is the market rate of interest (or the long term interest rate or the prime lending rate in this case), χ_t is the exchange rate (or the nominal effective exchange rate in this case), In_t is the rate of inflation (or the headline inflation in this case) while, i_t is the monetary policy rate (or the short term interest rate) at a particular period of time. More so, ε's denote serially uncorrelated white noise error terms for each series at time *t*. 'A_1' represents the coefficients of first lagged parameters while 'A_p' denotes the coefficients of the parameters up to lag *p* which was determined by Akaike-information and Schwarz criterion

3.4.4 Variance Decomposition

While impulse-response functions trace the effects of a shock to one endogenous variable on to the other variables in the SVAR, the Variance Decomposition provides information about the relative importance of each random innovation in affecting the random variables in the SVAR (Hamilton, 1994). Therefore, Variance Decompositions show the magnitude of the variations in the macro variables due to policy variables.

CHAPTER FOUR:

ANALYSIS OF THE RESULTS

4.0 Introduction

This Chapter presents the results of the various estimation techniques used to achieve the specific objective of the study. Unit root test was conducted to determine the order of stationarity, Granger causality to find the direction of influence among the variables, Impulse Response to identify the response of interest rate, exchange rate and inflation to shocks in MPR while Variance Decompositions helped in the establishment of the contributions of MPR to these variables.

4.1 UNIT ROOT TEST

The empirical analysis started with the investigation of the time series properties of each variable employed in the study by using both the Augmented Dickey Fuller (ADF) and Phillip Peron (PP) tests to determine the order of integration of the series. Table 2 below has shown that the two tests were consistent, signifying that the MPR, NEER, INF as well as LEND are all stationary at first difference which implied that, they were all integrated of order one.

Table 2: Results of Unit Root Test

Variable	Augmented Dickey Fuller (ADF) Test		PHILLIP PERON (PP) TEST		Oder of Integration
	Levels	First Difference	Levels	First Difference	
MPR	-1.121654	-4.495014	-1.426835	-7.126216	**I(1)**
NEER	-2.116657	-4.040414	-1.963850	-5.166931	**I(1)**
INF	-1.594496	-4.336490	-1.798398	-6.841454	**I(1)**
LEND	-1.334733	-4.147539	-1.556317	-7.360347	**I(1)**

Source: Computer Printout, 2012
Notes: The ADF and PPT critical value at 5% level is -3.4969. All the series had intercepts with trends respectively. The critical values are based on Mckinnon criterion. The optimal lag is selected on the basis of Akaike Information Criterion (AIC). The null hypothesis of the test is: a series has a unit root. The rejection of the null hypothesis is at the 5% level of significance. I(1) shows the level of integration.

4.2 GRANGER CAUSALITY TEST

The Monetary Policy Rate (MPR) has been designed as a nominal anchor, which supposed to determine the behaviour of inflation, interest and exchange rate in Nigeria. Hence, it was only rational to open the curtains of this analysis with the investigation of whether MPR has determined the direction or behaviour of inflation, interest and exchange rate or better still, whether the MPR has followed the behaviour of these macroeconomic variables. The Granger causality test was used to find answers to these inquisitive questions.

Table 3 shows a Unidirectional causality between the monetary policy rate (MPR) and the exchange rate (NEER) implying that it is the changes in the exchange rates that granger causes the CBN's changes in monetary policy rate (MPR) and not the other way round. In practice this could be viewed through the interest channel; if exchange rate depreciates, MPR could be increased to raise interest rate so as to bring down inflation and the end product would be a favourable exchange rate (See the interest parity theory in chapter two).

The table revealed some degrees of independence between the monetary policy rate (MPR) and the rate of inflation, indicating that more often than not changes in MPR do not usually lead to changes in the rate of inflation and vice versa; for example in March, 2011 the monetary policy committee (MPC) increased MPR by one hundred basis points from 6.50 to 7.50 and this was further increased to 8.00 in May with a view to bringing down the rate of inflation. However, these actions of the apex bank instead of bringing down the inflation as intended rather exacerbated the figure from 11.10 at the beginning of March to 12.20 at the end of May of the same year. Though the outcome is not consistent with our theoretical framework, it justified the result. The result could not be unconnected with the poor banking culture and habit in the country.

Furthermore, the causality test revealed the existence of unidirectional causality between the lending rate and the MPR, disclosing those changes in the rate of interest by banks and other

financial institutions granger causes changes in MPR by the CBN. This brought to light the fact that CBN brings changes in lending rate in tune with the prevailing economic policies by changing the MPR.

More so, the table has shown that all things being equal, changes in the exchange rate is granger caused by changes in either inflation or lending rate (see interest rate parity theory in chapter two).

To this end, we can conclude based on the data available and the result so far generated that it is the changes in either inflation or interest rate that granger cause the change in exchange rate and in turn changes in exchange rate or interest rate would automatically necessitate changes in MPR and that the two rates (interest and exchange) can be used to predict MPR.

Last but not the least, available data from the CBN official website (as at April, 2012) have established that MPC meetings strongly granger causes changes in MPR; for example, in 2011, out of the seven MPC meetings, MPR was changed 6 times (see appendix 4).

Table 3: Granger Causality Test

NULL HYPOTHESIS	F-Test	P-Value
NEER does not Granger Cause MPR	6.86327	0.00246
MPR does not Granger Cause NEER	0.46132	0.63334
INF does not Granger Cause MPR	1.09618	0.34271
MPR does not Granger Cause INF	0.38539	0.68236
LEND does not Granger Cause MPR	15.3976	0.0076
MPR does not Granger Cause LEND	0.50693	0.60567
INF does not Granger Cause NEER	3.79366	0.02969
NEER does not Granger Cause INF	1.47517	0.23914
LEND does not Granger Cause NEER	4.20384	0.02091
NEER does not Granger Cause LEND	1.11102	0.33771
LEND does not Granger Cause INF	0.95625	0.39168
INF does not Granger Cause LEND	0.77418	0.46687

Source: Computer Printout, 2012
Notes: All tests are achieved with a lag length chosen according to the Akaike criterion. The direction of causality is based on the probability value. The smaller p-value indicated the presence of causality (P Value less than 0.05 indicate the presence of causality).

4.3 IMPULSE RESPONSE FUNCTION: INTERPRETATION OF RESULT

Figure 2 below showed the responses of inflation (In_t), market rate of interest($\square_t$) and nominal effective exchange rate (χ_t) to shocks in the monetary policy rate (i_t). A value of zero means that the shocks in monetary policy rate have no effect on macroeconomic variables, implying that it does not influence them. On the other hand, a positive or negative value reveals respective increase or decrease in the monetary variables as a result of shocks in monetary policy rate. A lag length of two was chosen based on the Akaike information (AIC), Schwarz Criteria (SC) and Hannan-Quinn criteria (HQ). This lag was also justified owing to the fact that in Nigeria, CBN expects macroeconomic variables to take like two months to adjust to changes in monetary policy rate. Perhaps, this could be the more reason why the twelve members of the monetary policy committee of CBN meet every other month (bimonthly) to review MPR among other macroeconomic variables in line with the domestic economic conditions as well as the international challenges facing the Nigerian economy.

From the graph, a positive shock in MPR did not have immediate impact on the value of naira, but this became apparent only in the second month (justifying our choice of the lag length of two). Consequently, at the end of the second month further increase in MPR automatically led to increase in the exchange rate (value of naira). This outcome was not far from CBN's expectation, quantity theory of money as well as our a priori expectation.

When CBN decides to use contractionary monetary policy by increasing MPR (the short term interest rate), the immediate effect of this action is to increase the cost of funds. As a result banks would reduce their credit to marginal customers (normally SMEs), concentrate lending activities to short term projects and intensify deposit mobilization with higher rate of interest and other incentives. In essence, the increase in MPR (short term interest rate) would translate to increase in the nominal rate of interest (long term interest rate) in the economy. All things being equal high interest rate would serve as a cynosure (or incentive) for foreign investors to troop and invest in the economy. This state of affairs would automatically mean higher demand for local currency and would give birth to appreciation in exchange rate for the domestic currency. This has equally agreed with the interest rate parity theory reviewed in chapter two.

Another way to justify the result is that increase in MPR (contractionary policy) would lead to low inflation by exerting downward pressure on aggregate demand (i.e. by discouraging borrowing and encouraging savings). Undoubtedly, low inflation makes domestic goods and services cheaper and imported products dearer; this situation ceteris paribus, could lead to low demand for import (which could be mirrored as demand for foreign currency) as well as high demand for export (which could be viewed as the demand for local currency). The end product of this (all things being equal) would be increase in exchange rate (or the value of Naira). This has also gone in tandem with the Quantity Theory of Money (QTM) (see chapter two).

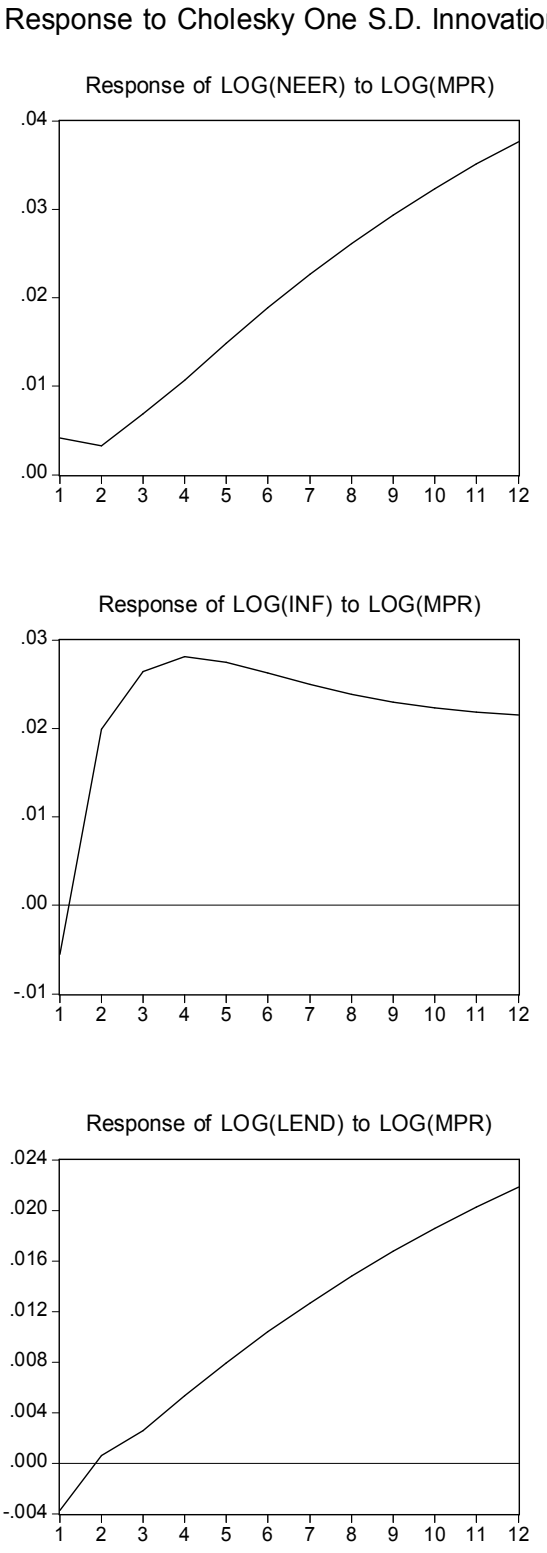
A careful observation of the response of inflation to shocks in MPR reveals oscillation between the two variables. To buttress this, an initial positive shock in MPR (i.e. a contractionary monetary policy) ab-initio led to a significant and consistent increase in the rate of inflation until the fourth month where the peak is reached. Unfortunately, this outcome did not agree with the Quantity theory of money and hence with our a priori expectation. However, the justification for this somewhat irregular result was not far-fetched;

First and foremost, in Nigeria, there has always been policy divergence between CBN and the federal ministry of finance; more often than not CBN uses contractionary monetary policy mechanisms, while the federal ministry of finance embarks on fiscal expansion. Another possibility for that result might be the poor banking culture and habit in Nigeria, more funds sleep outside the banking system. More so, the attitude of economic agents to effectively adjust their goals and resources to changing constraint and resources could be another reason for such a result. Last and probably, most importantly, the monetary policy pronouncement by CBN usually tend to be more reactionary than proactive to the development in the Nigerian economy and concentrate more on the demand management techniques.

Soon after the fourth month, the graph unveils that any further positive shock in MPR would expectedly lead to a gradually declining but positive rate of inflation. This confirmed the Quantity theory of money and our a priori expectation as well. Consequently, it revealed that if CBN should embark on restrictive monetary policy, by increasing the basis points of MPR, the cost of borrowing as well as the reward for lending would both be high. Hence, borrowing would be discouraged (owing to higher cost) and savings encouraged (owing to higher reward) and therefore mopping up the excess liquidity in the economy and by extension taming the menace of inflation. To further buttress this, in July, 2011 MPR was increased by 75% basis points, from 8.00 to 8.75 and this brought down inflation figures from 10.20 in June to a historic single digit of 9.30 in August of the same year.

The reaction of the lending rate to shocks in MPR was probably the best reflection of the ideal relationship existing between the two variables. The graph divulged the very much anticipated positive and near perfect linear relationship between the lending rate and MPR. This relationship has never been unexpected considering the significant influence of the monetary authority (CBN in this case) in determining the direction of the two variables. Undoubtedly, CBN through its monetary policy committee meetings shapes the character of MPR, and being the nominal anchor, the MPR is the policy rate which fully determines both the standing lending facility and standing deposit facility. The two facilities in question have direct and strong effect on the interbank rate and by extension the banks' lending rate. Hence, anything that influences the two would greatly affect the lending rate and of course, this was the more reason why MPR has such a gigantic influence on the lending rate.

Figure 2; Impulse Response functions



4.4 VARIANCE DECOMPOSITION: INTERPRETATION OF RESULT

To examine the effects of monetary policy rate (MPR) on inflation, interest and exchange rate we implore the use of variance decomposition depicted in table 4 below. From the said table, it was glaring that MPR contributed (impacted) much more in the variation of lending rate (LEND) throughout the period under consideration than to the variation (changes) in inflation rate (INF) and the nominal effective exchange rate (NEER). For example MPR accounted for 4.25% and 4.85% of the variability in the lending rate (LEND) in the second and third month. In the same period, MPR contributed 0.98% and 1.12% to the changes in inflation rate (INF). However, this contribution within same period was much lesser to exchange rate (NEER), where the record exposed a contribution of just 0.03% and 0.04% respectively.

In general, the result uncovered that MPR has much more contribution to interest rate (LEND) than inflation (INF) and exchange rate (NEER). It revealed that the greatest contribution of MPR is to interest rate (LEND), followed by the rate of inflation (INF) and eventually accompanied by exchange rate (NEER) (which receives the lowest share). In a less exact language, the result vindicated that the greatest impact (effect) of changes in MPR was on interest rate (LEND), followed by the rate of inflation (INF) and exchange rate (NEER) (in that order). Hence, this indicates that all things being equal, any change in MPR would first and foremost lead to changes in interest rate (LEND) which would in turn produce change in inflation (INF) and eventually give birth to changes in the exchange rate (NEER).

Fortunately, this result has tallied with our a priori expectation, we expect changes in MPR to have more effect on LEND and INF than NEER which ideally supposed to drive its impact from MPR via changes in inflationary pressures (See interest power parity (IPP) theory in chapter two).

Last but not the least, indications from the outcome of this analysis has disclosed that macroeconomic variables are idiosyncratic i.e. a bigger percentage of the changes in their

outcome was explained by their own innovations within the considered period suggesting that adjustments of aggregate demand in the real sector do not necessarily adhere to shocks in monetary policy variables.

TABLE 4: Result of the Variance Decomposition of MPR

Period	S.E.	MPR	NEER	INF	LEND
1	0.541043	100.0000	0.000000	0.000000	0.000000
2	0.784671	94.74262	0.028842	0.980136	4.248397
3	0.971818	93.98084	0.044715	1.121250	4.853195
4	1.124149	93.61196	0.096085	1.142685	5.149268
5	1.254172	93.44685	0.181391	1.108944	5.262818
6	1.368550	93.33390	0.293642	1.064398	5.308057
7	1.471383	93.23801	0.421720	1.023387	5.316880
8	1.565313	93.14686	0.555880	0.991513	5.305745
9	1.652139	93.05762	0.688752	0.970584	5.283040
10	1.733134	92.96996	0.815373	0.961001	5.253666
11	1.809238	92.88402	0.932736	0.962615	5.220633
12	1.881161	92.79981	1.039278	0.975050	5.185863

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

The study theoretically and empirically investigated how inflation, interest and exchange rate respond to shocks in monetary policy (captured by MPR). The research work used monthly data, beginning from December, 2006 (when the MPR was introduced) through February, 2012. The Structural VAR was employed to estimate the model, where the impulse response revealed how the inflation, interest and exchange rates responded to shocks in MPR and the variance decomposition brought to the limelight the impact of MPR on these Macroeconomic variables. The Granger Causality was equally used to disclose the causal direction among the variables, while Augmented Dickey Fuller (ADF) was conducted on all the variables before the estimations to establish the absence of stochastic process.

OUTLINES OF MAJOR FINDINGS

- Inflation responds to shocks in MPR only in a volatile manner (a pattern that is almost unpredictable); in the first four periods, positive shocks in MPR could not bring down inflation but thereafter, any further increase in MPR produced gradually declining but positive interest rate.
- Exchange rate responds to shocks in MPR in a relatively downward fashion and quickly assumes upward trend from the second period lasting throughout the periods.
- Interest rate responds quickly and positively to shocks in MPR from the first thorough the last period. Therefore, MPR has its greatest influence on interest rate (prime lending rate).

- Of all the three macroeconomic variables, inflation is the most difficult to deal with and cannot always be successfully conquered with the manipulation of MPR alone.
- Low and stable interest and exchange rate can only be achieved when inflation is low and stable. Hence, inflation is the greatest enemy of our economy.
- Changes in the interest and exchange rate as well as MPC meetings can be used to predict MPR.

5.2 CONCLUSION

The study concludes that both interest (prime lending rate) and exchange rates respond quickly and almost in a predictable way to shocks in MPR. However, changes in MPR do not automatically and consistently produce changes in inflation and above all inflation responds to shocks in MPR only in a volatile manner (a pattern that is almost unpredictable). Hence of all the three variables, inflation is the most difficult to deal with (stability of which could leads to stability in the remaining two) and could not be totally addressed by mere manipulations of MPR. Hence low and stable inflation is a necessary condition for the achievement of low and stable interest and exchange rate. We also conclude that MPR is also responsive to Monetary Policy Committee (MPC) meetings.

5.3 RECOMMENDATIONS

- Other monetary policy instruments particularly Cash Reserve Requirements (CRR) and especially, OMO should be prudently used to compliment MPR in achieving Price Stability.
- The current monetary tightening stance of the CBN is a step in the right direction but should be used with caution. Considering the dual objective of CBN, the monetary

policy should be tailored to promote real sector lending while trying to achieve low and stable inflation.

- There is the need for policy harmonization between the monetary and fiscal authorities. Budget deficit should be avoided and more fund be appropriated for capital as against the recurrent expenditures.

- CBN should license more banks to operate non-interest banking so as to boost financial deepening and inclusion. The large informal sector in the country that cripples the transmission mechanism of monetary policy and constraints the ability of CBN to control money supply was to some extent caused by cultural and religious belief that interest is unlawful; this could be avoided by introducing more non-interest banks.

- The "cashless policy" of CBN should be maintained, made more efficient and user friendly. Researches have shown that a system that is cash based is inefficient and distorts transmission mechanism. More efficient point of sale (POS) terminals, multifunctional ATMs as well as mobile payment compatible system should be put in place.

- There is the need for proper enlightenment of the public about any new CBN policy initiatives (e.g. non-interest banking & cash-lite policy). The communication strategy should be clear and concise.

- The physical and social infrastructures of the economy should be improved to reduce the cost of doing business and by extension the interest charged by the banks.

- The three tiers of Government should exercise fiscal prudence and fiscal responsibility act be fully implemented. More so, Banks and Other Financial

Institutions should improve their operational efficiency by cutting down overhead and any other unnecessary expenses.

- The CBN should reduce or strike out any unnecessary stringent documentation requirement for the purchase of forex in the official market. This would kill patronage and by extension the life of parallel market/street trading.

- To ensure policy continuity and consistency, the rate of turnover of CBN Governors should be checked and the frequency of MPC meetings be reduced to at most quarterly unless in case of emergencies.

- The Oil and Gas sector should be fully deregulated, corruption in the sector and other sectors of the economy be fought to the latter and above all the saved subsidy proceeds be used to boost physical infrastructure. This would reduce pressure on forex demand as well as cost of doing business and in addition boost external reserve in the country.

- Last but not the least, CBN should avoid policy summersault, a situation where CBN would initiate a policy that originally supposed to be applicable to all economic agents (e.g. cash-lite) and latter begin to exonerate some agents (e.g. government parastatals, foreign embassies, Primary Mortgage Banks, Microfinance Banks etc.) from compliance, would not augur well for the economy. If Monetary Policy must strive, the credibility of CBN should be held in high esteem especially under condition of uncertainty.

5.5 FUTURE DIRECTION OF RESEACH

Owing to the instability of the money multiplier and velocity of circulation of money as well as the transmission path of monetary policy, it's vital for future researches to concentrate on the feasibility of CBN adopting INFLATION TARGETTING as a new monetary policy framework.

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APPENDIX 1

Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-299.0551	NA	3.497559*	12.60220	13.21405	12.83520
2	-289.5852	15.90942	4.585928	12.86341*	14.08710*	13.32940*
3	-272.5612	25.87644	4.522808	12.82245	14.65799	13.52143

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

APPENDIX 2

VECTOR AUTOREGRESSION ESTIMATES

	MPR	NEER	INF	LEND
MPR(-1)	0.960789	0.502365	0.024301	0.107497
	(0.04374)	(0.41109)	(0.09441)	(0.04294)
	[21.9653]	[1.22204]	[0.25740]	[2.50323]
NEER(-1)	-0.005132	0.882602	-0.012795	0.009847
	(0.00721)	(0.06776)	(0.01556)	(0.00708)
	[-0.71189]	[13.0263]	[-0.82233]	[1.39126]
INF(-1)	0.006053	0.744555	0.983794	0.022099
	(0.02511)	(0.23602)	(0.05420)	(0.02466)
	[0.24101]	[3.15465]	[18.1507]	[0.89634]
LEND(-1)	0.053921	0.286773	0.108807	0.852117
	(0.06700)	(0.62965)	(0.14460)	(0.06577)
	[0.80482]	[0.45545]	[0.75247]	[12.9551]
R-squared	0.904349	0.923248	0.900595	0.832996
Adj. R-squared	0.898371	0.918451	0.894382	0.822559
Sum sq. resids	13.85746	1223.964	64.55036	13.35637
S.E. equation	0.537305	5.049679	1.159655	0.527501
F-statistic	151.2745	192.4643	144.9578	79.80625
Log likelihood	-39.40189	-155.9086	-79.40605	-38.44430
Akaike AIC	1.669303	6.150330	3.207925	1.632473
Schwarz SC	1.819399	6.300426	3.358021	1.782569
Mean dependent	8.000000	142.2233	11.01538	17.12308
S.D. dependent	1.685434	17.68297	3.568291	1.252265
Determinant Residual Covariance		2.549116		
Log Likelihood (d.f. adjusted)		-319.4686		
Akaike Information Criteria		12.90264		
Schwarz Criteria		13.50302		

APPENDIX 3

VARIANCE DECOMPOSITION OF MACROECONOMIC VARIABLES

VARIANCE DECOMPOSITION OF MPR

Period	S.E.	MPR	NEER	INF	LEND
1	0.541043	100.0000	0.000000	0.000000	0.000000
2	0.784671	94.74262	0.028842	0.980136	4.248397
3	0.971818	93.98084	0.044715	1.121250	4.853195
4	1.124149	93.61196	0.096085	1.142685	5.149268
5	1.254172	93.44685	0.181391	1.108944	5.262818
6	1.368550	93.33390	0.293642	1.064398	5.308057
7	1.471383	93.23801	0.421720	1.023387	5.316880
8	1.565313	93.14686	0.555880	0.991513	5.305745
9	1.652139	93.05762	0.688752	0.970584	5.283040
10	1.733134	92.96996	0.815373	0.961001	5.253666
11	1.809238	92.88402	0.932736	0.962615	5.220633
12	1.881161	92.79981	1.039278	0.975050	5.185863

VARIANCE DECOMPOSITION OF NEER

Period	S.E.	MPR	NEER	INF	LEND
1	4.811919	0.153175	99.84682	0.000000	0.000000
2	7.497399	0.087029	93.57793	0.340551	5.994494
3	9.290995	0.215114	90.19110	2.029703	7.564081
4	10.70106	0.946520	84.55918	5.632765	8.861531
5	11.96205	2.458162	77.06825	10.75763	9.715964
6	13.20590	4.609425	68.55333	16.63040	10.20685
7	14.48432	7.143702	59.99471	22.46585	10.39573
8	15.80802	9.812689	52.07537	27.73988	10.37206
9	17.16853	12.44385	45.12532	32.21333	10.21749
10	18.55102	14.94225	39.21490	35.84882	9.994032
11	19.94042	17.26899	34.27229	38.71583	9.742882
12	21.32394	19.41821	30.16816	40.92476	9.488871

VARIANCE DECOMPOSITION OF INF

Period	S.E.	MPR	NEER	INF	LEND
1	1.175615	0.346298	0.066237	99.58747	0.000000
2	1.678073	2.536941	1.206954	95.36529	0.890817
3	2.074223	3.929545	1.983723	93.12610	0.960628
4	2.391377	4.913228	2.466019	91.54770	1.073058
5	2.651972	5.698403	2.736885	90.39254	1.172174
6	2.870952	6.374126	2.877205	89.47169	1.276977
7	3.058421	6.993021	2.936971	88.68524	1.384768
8	3.221493	7.582944	2.946093	87.97603	1.494937
9	3.365294	8.160280	2.922905	87.31048	1.606335
10	3.493628	8.734779	2.878983	86.66817	1.718069
11	3.609384	9.312411	2.821898	86.03630	1.829389
12	3.714806	9.896845	2.756744	85.40673	1.939682

VARIANCE DECOMPOSITION OF LEND

Period	S.E.	MPR	NEER	INF	LEND
1	0.553261	0.391806	4.363171	2.666018	92.57900
2	0.723119	0.656278	7.080720	3.199001	89.06400
3	0.870066	1.576806	9.128020	4.227810	85.06736
4	0.997729	3.299840	10.63486	5.572731	80.49257
5	1.117951	5.641847	11.59636	7.212676	75.54912
6	1.235416	8.456863	12.07482	9.059159	70.40916
7	1.353038	11.56817	12.15591	11.02020	65.25572
8	1.472344	14.81578	11.93558	13.00539	60.24325
9	1.594040	18.06790	11.50514	14.93897	55.48799
10	1.718295	21.22781	10.94270	16.76447	51.06502
11	1.844951	24.23204	10.30981	18.44510	47.01305
12	1.973653	27.04486	9.651661	19.96104	43.34244

APPENDIX 4

MACROECONOMIC VARIABLES, DECEMBER, 2006 TO FEBRUARY, 2012

MPR	Ex Rate	Inf (CPI MVA)	Inf (Y- on-Y)	PLR	MLR
10.00	129.64	8.20	8.50	17.15	18.59
10.00	130.06	8.00	8.00	17.64	18.70
10.00	130.00	7.70	7.10	17.89	18.45
10.00	129.34	7.20	5.20	17.18	18.92
10.00	129.00	6.50	4.20	18.05	18.58
10.00	129.17	6.00	4.60	16.94	17.17
8.00	128.33	5.90	6.40	16.92	18.74
8.00	127.52	6.00	4.80	16.57	18.36
8.00	127.43	6.10	4.20	16.42	18.27
8.00	126.50	5.90	4.10	16.46	18.27
9.00	126.50	5.70	4.60	16.48	18.21
9.00	123.80	5.50	5.20	16.46	18.25
9.50	123.80	5.40	6.60	16.46	18.21
9.50	121.39	5.50	8.60	16.19	18.52
9.50	120.80	5.50	8.00	16.18	18.33
9.50	119.57	5.80	7.80	15.78	17.66
10.00	119.00	6.10	8.20	15.72	18.72
10.00	118.80	6.50	9.70	15.83	17.91
10.25	118.70	7.00	12.00	16.04	17.08
10.25	119.00	7.80	14.00	16.09	17.92
10.25	119.00	8.50	12.40	15.99	17.17
9.75	119.00	9.20	13.00	15.84	19.22
9.75	119.00	10.10	14.70	16.01	19.23
9.75	119.01	10.90	14.80	16.00	18.97
9.75	145.95	11.60	15.10	16.08	21.18
9.75	149.90	12.00	14.00	16.81	21.27
9.75	156.90	12.60	14.60	18.95	21.54
9.75	174.30	13.10	14.40	19.25	23.91
8.00	180.27	13.50	13.30	19.34	23.17
8.00	180.63	13.80	13.20	19.53	22.86
8.00	166.10	13.70	11.20	18.16	22.64
6.00	155.10	13.40	11.10	18.90	22.80
6.00	158.95	13.30	11.00	18.00	19.75
6.00	158.00	13.10	10.40	18.01	22.82
6.00	153.04	12.80	11.60	18.30	22.81
6.00	152.95	12.60	12.40	18.93	23.10
6.00	153.48	12.50	13.90	19.03	23.46
6.00	153.55	12.60	14.40	18.90	23.18
6.00	152.07	12.70	15.60	18.12	23.06
6.00	151.85	12.80	14.80	19.03	23.62

6.00	152.00	12.90	15.00	19.05	23.47
6.00	153.26	12.90	12.90	18.77	22.56
6.00	153.87	13.10	14.10	17.65	22.03
6.00	152.41	13.30	13.00	17.40	22.27
6.00	153.23	13.50	13.70	16.89	22.31
6.25	153.85	13.80	13.60	16.66	22.18
6.25	153.98	13.90	13.40	16.16	21.85
6.25	153.13	13.90	12.80	16.11	21.84
6.25	149.17	13.10	13.40	16.10	21.83
6.50	151.62	13.50	12.10	15.73	21.75
6.50	151.96	13.20	11.10	15.73	21.88
7.50	152.54	13.00	12.80	15.81	22.02
7.50	153.92	12.70	11.30	15.75	22.19
8.00	154.80	12.60	12.40	15.81	22.11
8.00	154.46	12.30	10.20	15.76	22.02
8.75	151.82	12.00	9.40	15.84	22.42
8.75	152.72	11.60	9.30	15.82	22.27
9.25	155.26	11.40	10.30	15.87	22.09
12.00	153.26	11.10	10.50	16.49	23.32
12.00	155.71	11.00	10.50	16.82	23.35
12.00	158.23	10.80	10.30	16.75	23.21
12.00	158.38	10.90	12.60	16.92	23.08
12.00	157.87	11.00	11.90	17.11	23.13

Source: CBN, 2012: http://www.cbn.gov.ng and NBS, 2012: www.nigerianstart.gov.ng

Appendix 5

World Inflation Rate, countries comparison

Country	March, 2012	2011	2010	2009	2008	2007
Venezuela	24.60	27.60	27.20	26.90	31.90	22.50
Tanzania	19.40	19.80	5.60	12.20	13.50	6.40
Kenya	15.61	18.93	4.51	5.32	27.72	12.00
Vietnam	14.00	18.13	11.75	6.52	19.87	12.75
Nigeria	11.90	10.30	11.80	13.90	15.10	6.60
Angola	11.38	11.38	15.31	14.00	13.18	11.78
Mongolia	10.80	11.10	14.30	1.90	20.80	15.10
Pakistan	10.80	9.75	15.46	10.52	23.34	8.79
Bangladesh	10.43	10.63	8.28	8.51		
Turkey	10.43	10.45	6.40	6.53	10.10	8.39
Egypt	9.90	10.40	10.30	13.50	18.30	6.90
Argentina	9.80	9.50	10.90	7.70	7.20	8.50
India	9.47	7.50	9.47	14.97	9.70	5.51
Botswana	8.80	9.20	7.40	5.80	13.70	8.10
Ghana	8.60	8.58	8.58	16.00	18.10	12.70
Rwanda	7.81	8.34	0.20	5.70	22.30	6.60
Algeria	7.53	5.16	2.73	5.74	4.46	3.51
Namibia	6.60	7.20	3.10	7.00	10.90	7.10
Iceland	6.40	6.50	2.50	7.50	18.13	5.86
South Africa	6.00	6.10	3.50	6.30	9.50	8.90
Kazakhstan	5.90	7.40	7.80	7.30	17.00	10.80
Bolivia	5.86	6.90	7.18	0.26	11.85	11.73
Hungary	5.50	4.10	4.70	5.60	3.50	7.40
Sri Lanka	5.50	4.90	6.90	4.80	14.40	18.80
Saudi Arabia	5.40	5.30	5.40	4.25	8.98	6.47
Brazil	5.20	6.50	5.91	4.31	5.90	4.46
Mozambique	5.10	6.14	17.44	2.26		
Tunisia	5.10	4.20	4.00	4.10	4.10	5.10
Hong Kong	4.70	5.70	2.90	1.30	2.10	3.80
Singapore	4.60	5.50	4.60	-0.50	5.50	3.70
Estonia	4.40	3.70	5.72	-1.71	6.98	9.57
Paraguay	4.40	4.90	7.20	1.90	7.50	6.00
Peru	4.23	4.72	2.08	0.25	6.65	3.93
Poland	3.90	4.60	3.10	3.50	3.30	4.00
Chile	3.80	4.40	3.00	-1.06	7.76	6.27
Czech Republic	3.80	2.40	2.30	1.00	3.60	5.40
Slovakia	3.80	4.40	1.30	0.50	4.40	3.40
Mexico	3.73	3.82	4.40	3.57	6.53	3.76
Russia	3.70	6.10	8.80	8.80	13.30	11.90
Ukraine	3.70	4.60	9.10	12.30	22.30	16.60
China	3.60	4.10	4.60	1.90	1.20	6.50
Lithuania	3.60	3.40	3.80	1.30	8.50	8.10

Indonesia	3.56	3.79	6.96	2.78	11.06	6.59
United Kingdom	3.50	4.20	3.70	2.90	3.10	2.10
Colombia	3.40	3.73	3.17	2.00	7.67	5.69
Thailand	3.40	3.60	3.00	3.50	0.40	3.20
Italy	3.30	3.30	1.90	1.00	2.20	2.60
Latvia	3.30	4.00	2.40	-1.40	10.40	14.00
Australia	3.10	3.10	2.70	2.10	3.70	3.00
Belgium	3.10	3.20	3.40	0.30	2.70	3.10
Portugal	3.10	3.70	2.50	-0.10	0.80	2.70
South Korea	3.10	4.20	3.50	2.80	4.14	3.61
Finland	2.90	2.90	2.90	-0.50	3.50	2.60
Luxembourg	2.90	3.20	2.78	1.80	1.09	3.40
Macedonia	2.75	2.80	3.00	-2.10	5.50	4.90
Denmark	2.70	2.50	2.80	1.40	2.40	2.30
Euro Area	2.70	2.70	2.20	0.90	1.60	3.10
Philippines	2.70	4.20	3.10	4.40	8.00	3.90
United States	2.70	3.00	1.50	2.70	0.10	4.10
Canada	2.60	2.30	2.40	1.30	1.20	2.40
Netherlands	2.50	2.40	1.90	1.10	1.90	1.90
Austria	2.40	3.20	2.30	1.10	1.50	3.50
Romania	2.40	3.14	8.00	4.80	6.30	6.60
France	2.30	2.50	1.80	0.90	1.00	2.60
Slovenia	2.30	2.00	1.90	1.80	2.10	5.60
Ireland	2.20	2.50	1.30	-5.00	1.15	4.70
Malaysia	2.20	3.00	2.20	1.10	4.40	2.40
Germany	2.10	2.10	1.70	0.80	1.10	3.10
Spain	1.90	2.40	3.00	0.80	1.40	4.20
New Zealand	1.80	1.80	4.00	2.00	3.40	3.20
Bulgaria	1.70	2.80	4.50	0.60	7.80	12.50
Greece	1.70	2.40	5.20	2.60	2.00	3.90
Israel	1.70	2.20	2.70	3.90	3.80	3.40
Morocco	1.60	1.70	2.20	-1.60	4.00	
Sweden	1.50	2.30	2.30	0.90	0.90	3.50
Qatar	1.20	2.10	-0.14	-9.96	13.16	
Taiwan	1.20	2.03	1.24	-0.25	1.27	3.33
Norway	0.80	0.20	2.80	2.00	2.10	2.80
United Arab Emirates	0.73	0.20	1.73	1.56	12.30	11.10
Japan	0.30	-0.20	0.00	-1.70	0.40	0.70
Switzerland	-1.00	-0.70	0.50	0.28	0.70	2.00

Source; http://www.tradingeconomics.com/inflation-rates-list-by-country