CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Monetary policy is a deliberate action of the monetary authorities to influence the quantity, cost and availability of money credit in order to achieve desired macroeconomic objectives of internal and external balances (CBN, 2011). The action is carried out through changing money supply and/or interest rates with the aim of managing the quantity of money in the economy. The importance of money in economic life has made policy makers and other relevant stakeholders to accord special recognition to the conduct of monetary policy. The Central Bank of Nigeria is the organ that is responsible for the conduct of monetary policy in Nigeria.

According to Onoh (2013), there is need to analyse the monetary policy of an economy to facilitate the design of an appropriate macroeconomic policy framework, which will promote sustainable economic development, domestic stability and external balance. He further noted that a number of variables are involved in the design of macro-economic policy but the strategic importance of the monetary variables cannot be ignored. Authorities ignored it at the peril of the economy. An important function of monetary authority, such as central bank in most countries is to exercise a firm control over money supply, generally considered the nerve-centre of the economy. The firm control over money supply can only be achieved through information obtained from monetary analyses. Onoh (2013) argued that a monetary authority must be adequately equipped for monetary data collection, storage and retrieval of data for use, where and when necessary.

Monetary policy can either be expansionary or contractionary, depending on the overall policy thrust of the monetary authorities. Monetary policy is expansionary when the policy adopted by the central bank increases the supply of money in the system and contractionary, when the actions reduce the quantity of money supply available in the economy or constrains the growth or ability of the deposit money banks to grant further credit (CBN,2011). The primary objective of monetary policy is to ensure monetary and price stability (CBN, 2007). This gives the citizens confidence in the future value of their money, so that they can make sound economic and financial decisions. Low and stable inflation also helps to prevent inflationary boom and bust cycles that could result in a recession and higher unemployment. The major objective of monetary policy for most central banks is the attainment of price stability. An associated objective is stable growth with full employment(accompanied by stable long-term interest and real exchange rates). In pursuit of the objective of price stability and its accompanying objectives, central banks recognize the existence of conflicts amongst the objectives and the need for trade-offs.

Money supply is the amount of money that is available to the economy at any point in time (Okaro, 2014). Similarly, Onoh (2013), stressed that Money supply could be defined both in narrow and broad terms, depending on the ease with which it could be converted into cash. A narrow definition of money supply comprises currency in circulation and demand deposit, while a broader definition would include balances in other deposit accounts. In Nigeria, narrow money (M1) consists of the currency in circulation plus demand deposits while broad money (M2) is made up of narrow money plus savings, time and foreign currency deposits. The definition of what constitutes narrow or broad money depends to a large extent on the level of development of financial infrastructure and its deployment.

Nigeria‘s monetary policy strategy is anchored on the attainment of internal balance and external viability (CBN, 2011).This philosophy has evolved in terms of techniques and instruments. In recent times, the CBN recognized that achieving stable prices would require a continuous reassessment and evaluation of its monetary policy implementation framework to enable it respond to the ever-changing economic and financial environment. Against the requirement for internal and external balance, the CBN announced anew monetary policy framework effective 11th December, 2006. The goal of the new implementation framework was to achieve a stable value of the domestic currency through stability in short-term interest rates around an ―Operating Target‖ - the interest rate, which is determined and operated by the CBN. The―Operating Target‖ rate i.e. the ―Monetary Policy Rate‖ (MPR), serves as an

indicative rate for transaction in the money market as well as other Deposit Money Banks' (DMBs) retail interest rate. According to CBN (2011), the operating principle guiding the new policy is to control the supply of settlement balances of banks and motivate the banking system to target zero balances at the CBN, through an active interbank trading or transfer of balances at the CBN. This is aimed at engendering symmetric treatment of deficits and surpluses in the settlement accounts, so that for any bank, the cost of an overdraft at the CBN would be equal to the opportunity cost of holding a surplus with the Bank. The intervention in the market was to take the form of a standing lending/ standing deposit facilities that ensured an orderly operation of the market.

Monetary policy is one of the macroeconomic instruments with which nations (including Nigeria) use in managing their economy. It entails those actions initiated by the Central Bank which aim at influencing the cost and availability of credits (Nwankwo, 1991). It covers gamut

of measures or combination of packages intended to influence or regulate the volume, prices and direction of money in the economy.

Specifically, it permeates all the efforts by the monetary authorities to control the money supply and credit conditions for the purpose of achieving diverse macroeconomic objectives (Ajie & Nenbee, 2010). In the view of Chamberlin and Yueh, (2010),monetary policy - the act of controlling the supply and price of money, may exert a powerful influence on the economy. Macroeconomic policies in developing countries are designed to stabilize the economy, stimulate growth and reduce poverty (Nnanna, 2006).

In Nigeria, the achievements of these objectives are predicated on the stance of fiscal and monetary policies (Idowu, 2010; Nenbee & Madume, 2011). Fiscal policy is a policy under which the government uses its revenue and expenditure programmes to produce desirable effect and avoid undesirable effect on the national income, production, employment and even price. 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. The primary objective of monetary policy management in Nigeria is to ensure a stable macroeconomic environment, which is the basis for promoting sustainable economic growth and develAssociated objectives of CBN monetary policy management includes full employment, stable long-term interest rates and real exchange rates stability. In pursing these objectives, the CBN recognises the existence of conflicts among the objectives necessitating the need for trade-off (Uchendu, 2010). The Bank manipulates the

operational target of 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 this 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 CBN derives its mandate from the CBN Act of 2007(as amended)and in specific terms, part one, section of the CBN Decree No. 24 of 2007 (as amended), 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 (Naira); ensure monetary

stability, promote sound financial system in Nigeria, and act as banker and provider economic financial advice to the Federal Government of Nigeria (CBN, 2012).

There is a general consensus among Economists and Policy Makers that price instability undermines the role of money as a store of value and frustrates investments and growth (Nnanna, 2001). The primary and current monetary policy framework focuses on the maintenance of price stability and a stable exchange rate, while the promotion of economic growth and employment are the secondary goals. In a bid to achieve desired level of stability and growth, the CBN had employed so many policy measures as spelt out in the CBN Monetary Committee decisions in 2012.

1.2 Statement of the Problem

According to CBN (2011), the objectives of monetary policy may vary according to the level of development of the economy involved, but invariably; they include the attainment of price stability, maintenance of external payments equilibrium, as well as promotion of employment and output growth, and sustainable economic development. Irrespective of the type of economy, these objectives are critical for the attainment of internal and external balance and ultimately the promotion of long-run economic growth. Where the stability of the financial system is threatened, these short and long term objectives could be subordinated to the overriding objective of achieving financial stability.

Monetary policy involves the measure through which the central bank manages the supply of money, inorder to stabilize prices. Though the primary objective of monetary policy is the attainment of low and stable inflation, the central bank also has the added mandate to promote economic development and employment. The CBN (2017) argued that in practice, monetary policy plays a counterbalancing role to address price stability concerns and stabilize the economy. During a period of high inflation, contractionary monetary policy is used to reduce the amount of money in circulation while expansionary

monetary policy is used when economic condition is weak. Depending on the level of the financial development of a country, monetary policy is usually implemented through the banking system and the financial market. Implementing monetary policy involves interactions between the monetary authorities and financial intermediaries, using tools of monetary policy including reserve requirements, open market operation, and the policy rate, among others. Various frameworks of monetary policy have been used including monetary targeting, exchange rate targeting, inflation targeting, etc. In recent times, unconventional (non-standard monetary policy has been implemented to address substantial economic meltdown due to adverse global financial conditions (CBN, 2017).

In pursuit of the provisions of the CBN Act 2007, the primary objective of monetary policy has remained the maintenance of monetary and price stability. Generally, the monetary policy of the CBN is anchored on four main pillars (CBN, 2017):

(i) Inflation as a monetary phenomenon;

(ii) The public‘s expectation of future inflation (this is crucial in the setting of current wages and prices). A corollary to this is that there is no long-run trade-off between unemployment and inflation; to anchor expectations;

(iii) Proactive and rule based monetary policy (for instance, under the Taylor rule, for monetary policy to stabilize prices, the nominal interest rate must be raised by more than the level of inflation); and

(iv) The need for monetary policy to be undertaken outside the control of the political authorities i.e. independence of the central bank to conduct monetary policy.

Equally, the Monetarist Economist believes that Changes in monetary policy rates should result to direct and proportionate change in Economic Development of a country;economic growth being one of the cardinal objectives of monetary policy, and every nation strives to attain a sustainable level of economic growth which will invariably translate into economic development that will ensure a reduction of

unemployment rate, poverty, and poor standard of living which will eventually affect negatively on social welfare/wellbeing of the citizens. Most researchers have been unable to come to a consensus on what should be the exact effect of monetary policy instruments on economic development of a country and there has been array of debates on such outcome. For instance; On Broad money supply, Olubusoye and Oyaromade (2008) investigated inflation, money supply and economic development in Nigeria using the framework of error correction mechanism and found out that the lagged consumer price index (CPI) among other variables propagate the dynamics of inflationary process in Nigeria. The level of output was found to be insignificant but the lagged values of money supply was found to be negative and significant only at 10% level in the parsimonious error correction model, while Omoke and Ugwuanyi (2010), Okpara, (1998) in their long-run study of money, price and output in Nigeria found out no cointegrating vector but however found out that money supply granger causes both output and inflation, suggesting that monetary stability can contribute towards price stability; Also, for interest rate mechanism, Ditimi (2009) adopted a simplified ordinary least squared technique and conducted the unit root and co-integration test in his analysis on monetary policy and macroeconomic stabilization in Nigeria and found out that interest rate has an insignificant influence on price stability while in a similar investigation, Adofu, Abula and Audu (2010) analysed the impact of interest rate deregulation on the Nigerian economy using a time series data spanning 1986-2005 and observed that interest rate plays a significant and positive role in enhancing economic activities; For reserve ratio, we observed that while Onyeiwu (2012), who studied monetary policy and Economic development found a positive and significant relationship between Economic development and reserve ratios like liquidity ratio, Saibu and Nwosa (2011), however discovered only an insignificant relationship; and finally for open market operations medium, Sanchita and Rina (2011) maintained from their studies that there exist a significant between treasury bill operations and economic development but Saibu and Nwosa (2011), disagree with this view point and held from their research work that there is no significant relationship between treasury bill operations and economic development.

Hence, summarily, Sanchita and Rina (2011), Sanusi (2002), Omoke and Ugwuanyi (2010), Okpara and Nwoha (2010), Adofu, Abula and Audu (2010), all agreed that there is a positive and significant relationship between monetary policy instruments such as broad money supply etc and economic growth. While, conversely Olubusoye and Oyaromade (2008), Omofa (1999), Salisu (1993) hold that the relationship is not significant. And more worrisome is the result of the findings of Ditimi (2009) that there is no relationship.

From above studies, it is evident that there is huge disagreement on the likely effect of monetary policy instruments on the economy of a country; hence, while some researchers opine that the effect is positive and significant in the short-run(Suleman, Wasti, Lal & Hussaini, 2009; Adofu, Abula & Audu, 2010) , others maintain that it is negative (Folawewo & Osinubi, 2006; Eregha, 2010) and in some cases not significant while some hold that there is no relationship (Ditimi, 2009). Similarly, other researchers are of the view that there is no cointegration relationship between the monetary policy instruments and economic development (Omoke & Ugwuanyi, 2010) while other group of scholars believe that there is a co-integrating vector between the variables (Okpara & Nwoha, 2010; Sanchita & Rina, 2011; Sanusi, 2002). A further lacuna observed is that most of these researchers used gross domestic product (GDP) to capture economic developmentand instead of using Human Development index (HDI) (Suleman, Wasti, Lal & Hussaini, 2009; Adofu, Abula & Audu, 2010; Folawewo & Osinubi, 2006; Eregha, 2010; Okpara & Nwoha, 2010; Sanchita & Rina, 2011; Sanusi, 2002), as it focuses on measuring the income effect on overall economy (Al-Hilani, 2012), whose import appears to have been

outlived by more modern measurement parameter such as Human Development index for the measurement of economic development, which measures how these policy instruments affects the micro units of the economy such as the household, business firm etc (UNDP, 2016). Hence, in this work, we intend to address these grey areas of disagreements among notable scholars as well as use a more modern and refined tool in measuring economic development, Human Development Index (HDI).

1.3 Objectives of the Study

The broad objective of the study is to examine the Effect of monetary policy instruments on Economic Development of Nigeria from 1986 to 2016. The specific objectives of the study are as follows;

1. To determine the relationship between broad money supply measured by currency in circulation, demand deposits and quasi money, and economic development of Nigeria.
2. To ascertain the relationship between discount rate mechanisms represented by monetary policy rates and interest rates, and economic development of Nigeria.
3. To critically examine the nature of relationship between Reserve requirements captured by liquidity ratios and economic development of Nigeria.

4. To evaluate the relationship between Open market operations measured by Treasury Bill rates, and Central Bank of Nigeria Treasury Certificate rate, and economic development of Nigeria.

1.4 Research Questions

From the foregoing, the following research questions are germane;

1. What is the relationship between broad money supply measured by currency in circulation, demand deposits and quasi money, and economic development of Nigeria?
2. What is the relationship between discount rate mechanisms represented by monetary policy rates and interest rates, and economic development of Nigeria?
3. What is the nature of relationship between Reserve requirements captured by liquidity ratios and economic development of Nigeria?
4. What is the relationship between Open market operations measured by Treasury Bill rates, Central Bank Treasury Certificate rate, and economic development of Nigeria?

1.5 Research Hypotheses

In Carrying out this research, four (4) hypotheses are proffered to assess the effect of monetary policy instruments on economic development of Nigeria. The relationships between these variables are stated in the null form (Ho).

Ho_1: There is no significant relationship between broad money supply (M_2) captured by currency in circulation, demand deposit and quasi money, and economic development of Nigeria.

Ho_2: There is no significant relationship between discount rate mechanisms measured by interest rate and monetary policy rate, and economic development of Nigeria.

Ho_3: There is no significant relationship between reserve requirements represented by liquidity ratio and economic development of Nigeria.

Ho_4: There is no significant relationship between open market operations represented by Treasury bill rates and central bank treasury certificate rates, and economic development of Nigeria.

1.6 Scope of the Study

The study used macroeconomic data in Nigeria that cover the period between 1986 and 2016. This period is considered long enough to minimize the chances of committing either type I or type II errors in trying to achieve the targeted objectives. This period witnessed the introduction of the federal government Structural Adjustment Programme, foreign exchange deregulation, discount windows, High inflation and interest rate regimes, and financial institutions distress resolution to Bank consolidations.

The economy has experienced at least four major phases in its practice of monetary policy. The first phase was between 1975 and 1985 which relied on the deregulation of monetary policy using direct monetary policy instruments such as credit ceilings, selective credit control or credit rationing. The second phase also relied on the deregulation of monetary policy which was

adopted between 1986 and 2003. The third phase was between 2004 to 2008, which experienced demonetization and consolidation of monetary policy while the fourth phase spanned from 2008 till date, which represents new era of monetary policy. The order of these phases notwithstanding, the study will cover a period of thirty(30) years – 1986 to 2016. More so, the Nominal Effective Exchange Rate (NEER) was used to capture exchange rate while the headline inflation figures from National Bureau of Statistics (NBS) was used for inflation in the research study. For economic growth, the data for GDP from the CBN Statistical bulletin (several issues) was used.

1.7 Limitation of the Study

This work focused only on study of the Nigerian macroeconomic spectrum as dictated by the central banks of Nigeria covering thirty (30) years. The data used were limited to all relevant data as provided by Central Bank of Nigeria, World Bank and the United Nations Development Project reports covering the study period as reported by these institutions and we are constrained to adopt them as advised. Also, difficulty in gathering relevant data was considered a major limitation which we reasonably subdued through information gathered reasonably from the world-wide-web. Hence, this study is limited to Nigerian macroeconomic environment, a thirty (30) year period from 1986 to 2016 only and we shall restrict the independent variables to four component instruments, namely – Broad money supply, Discount rate mechanisms, Reserve requirements and Open market operations window.

1.8 Significance of the Study

The primary role of Macroeconomic instruments include price stability, full employment and Economic development. This research amongst other things is expected to broaden the scope of knowledge in the following areas:

1. **Investors:** It will expose the functional relationship existing among the variables of interest which will sharpen their monetary policy appraisal skills and hunches. It will further bring to fore the seemingly silent but significant relationship between monetary policy and economic development to the advantage of both prospective and existing investors in the Nigerian macroeconomic business environment.

2. **Policy Makers**: To encourage policy makers, regulators and the government, to develop appropriate capacities and put in place adequate structures to guide and monitor excellent performance of the monetary policy environment in particular and financial system in general. This current research work contributes to the current literature as it adopts a thirty years period with a more recent data (1986 – 2016) as against other empirical studies in the literature reviewed particularly on Nigeria. The robustness of this result will enable the government, monetary authorities and operators to make informed decisions.

3. **The Academia:** To serve as a knowledge bank and reference on monetary policy and economic development analysis for prospective researchers and students of the banking and finance discipline.

4. **Economic Watchers/General Public:** the general public will gain some insight into the economic and monetary phenomena called monetary policy. It will further enlighten them on whether or not the hypothesized relationship with monetary policy truly exists.

1.9 Definition of Operational Terms

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 charged 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.

Interbank 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 (sometimes overnight 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 ending transaction with both parties maintaining the right of liquidation or 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 bill 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 the price index over one year. It is calculated as $\left(\frac{X_2}{X_1 - 1}\right) \times 100$; where X_2 is CPI in the current year, x_1 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 two (2) parties to exchange a set amount of one (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 from 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 is not 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 $1/100^{th}$ 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 of 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: this 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 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 is 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.

Human Development Index - Is an economic model that considers intrinsic personal factors not considered in economic growth, such as literacy rates, life expectancy and poverty rates.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter is divided into three, the conceptual, theoretical and empirical literature; the conceptual framework break down in piece meals the key words in the study (monetary policy, price stability, exchange rates, treasury bill rates, money supply and economic development) in addition to other important terminologies used in the research. The empirical literature reviews various researches that are considered germane to this 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.

The conceptual framework breaks down in piece meals the key words in the study (monetary policy, price stability, exchange rates, Treasury bill rate, money supply and economic development) in addition to other important macroeconomic variables used in the research.

2.1 Conceptual Review

2. 1. 1 Historical Background of Monetary Policy in Nigeria

Over the years, the objectives of monetary policy had remained the attainment of internal and external balance. However, emphases on techniques/instruments to achieve the objectives had changed over the years. There have been two major phases in the pursuit of monetary policy in Nigeria; namely- Pre SAP (before 1986) and Post SAP (after 1986). The first phase place emphasis on direct monetary controls, while the second phase relies on market mechanism (Meltzer, 1995). (See Table 2.1 appendix 1)

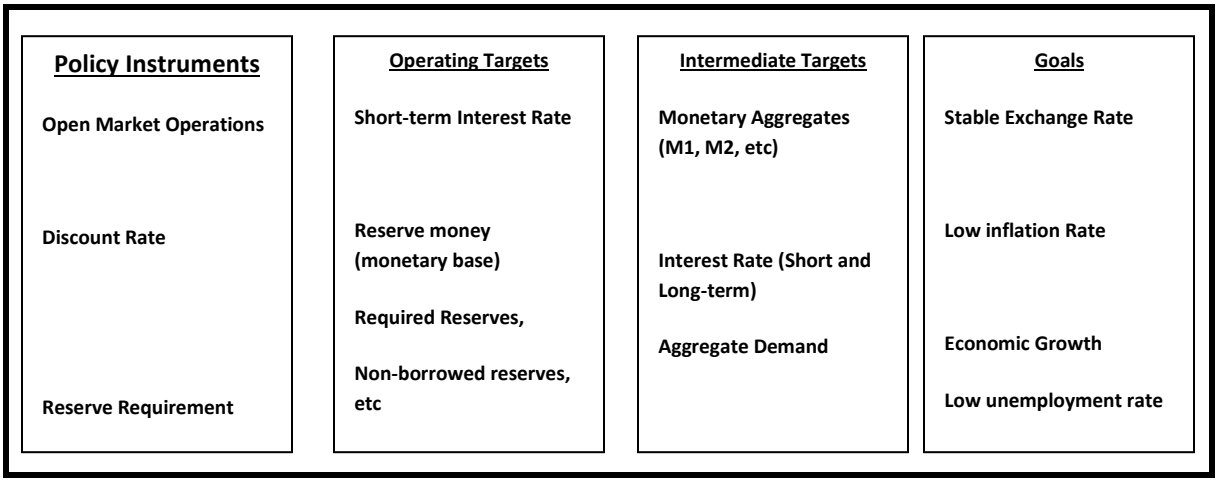


Fig. 2.1: **Monetary Policy Tools, Targets and Goals**

Source: (Handa, 2009)

2.1.1.1 Monetary Policy Variables

According to the CBN (2011), monetary policy guides the central bank's supply of money in order to achieve the objectives of price stability (or low inflation rate), full employment, and growth in aggregate income. This is necessary because money is a medium of exchange and changes in its demand relative to supply, necessitate spending adjustments. Fiduciary or paper money is issued by the central bank based on an estimate of the demand for cash. To conduct monetary policy effectively, the central bank adjusts the monetary aggregates, the policy rate or the exchange rate in order to affect the variables which it does not control directly. The instruments of monetary policy used by the central bank depend on the level of development of the economy, especially the financial sector. These instruments could be director indirect.

The major instrument of indirect monetary control in Nigeria is the Open Market Operations (OMO). As at date this instrument has been complemented by reserve requirements, CBN securities, as well as moral suasion.

2.1.1.2 Direct Instruments of Monetary Policy

i. Direct Credit Control

The central bank can direct Deposit Money Banks on the maximum percentage or amount of loans (credit ceilings) to different economic sectors or activities, interest rate caps, liquid asset ratio and issue credit guarantee to preferred loans. In this way the available savings is allocated and investment directed in particular directions as desired by the authorities.

2.1.1.3 Indirect Instruments of Monetary Policy

i. Money Supply

Onoh (2007) defined money supply as the stock of money in an economy and comprises of Narrow and broad monies, M_1 and M_2 respectively, can be generated either from the liabilities column or assets column of the monetary balance sheet. The M_1 represents the total currency in circulation and demand deposits while the M_2 represents M_1 plus savings deposit, time deposits and other liabilities such as foreign currency deposits.

Money supply policy can either be expansionary or contractionary, depending on the overall policy thrust of the monetary authorities. Money policy is expansionary when the policy adopted by the central bank increases the supply of money in the system and contractionary, when the actions reduce the quantity of money supply available in the economy or constrains the growth or ability of the deposit money banks to grant further credit (CBN,2011).

Onoh (2007) further noted that apart from the monetary assets and monetary liabilities above, there are other variables which directly or indirectly influence the periodic changes in the level of money supply. They include current ratio, demand deposit ratio, reserve ratio, the bank credit

multiplier, the level of base money and the degree of monetization of foreign assets by government and the domestic credits extended by banks to both public and private sector. Other factors include inflation rate, interest rates, exchange rates and fiscal operations of government.

Andrezj (2014), observed that money supply influence on prices as well as production and employment in economy has been the elementary issue in the theories of various schools of economics. They fundamentally differ in the evaluation of whether changes in the quantity of money inspire changes only in the sphere of money or also in the real sphere1. The problem of money's neutrality is thus an issue significantly affecting the targets of the monetary policy. The most popular theory on the effects of changes in the money supply is the quantity theory of money. In its basic version, it was presented by I. Fisher from the mathematical perspective. Monetarism is a contemporary school whose theory is based on it. M. Friedman treated the quantity theory as the theory of the demand for money, arguing that previous versions should not be understood differently. In his research, he substituted the velocity of money with the function of the demand for money. According to him, this demand is stable from the real perspective as it depends on the real permanent income. It is determined by the society's income expected in a long term. It does not change as often as the current income. When analysing an increase of inflation and unemployment in the United States in the 1960s and 1970s, the monetarists negated the existence of the Keynesian Philips curve in a long term. They stated that there is no choice between low unemployment and high inflation or *vice versa*. For a long term, prices and wages are flexible, so there is an equilibrium in the labour market with a certain level of unemployment. This is the famous Friedman's natural rate of unemployment where unemployment is voluntary. Short-term deviations of the actual unemployment rate from the natural one determine the deviations of the actual output from the potential level. This means that inflation does not depend

on the unemployment rate that will oscillate around the natural level. Economists consider it to be variable and dependent on many factors, e.g. the mobility of labour force.

According to Okaro (2014), an expansionary monetary policy for instance will raise the price of equity (i.e. reduce the yield on equities). It was further noted that the margin between the market valuation and the cost of reproducing the existing capital goods will stimulate new investments in these goods. Tobin and Brainard (1968) noted that the equity rate is the major link between money and the level of economic activity. The non-monetarist school of thought known as the new-Fisherians, comprising of the USA federal reserve-MIT school of thought argue that changes in the quantity of money have direct impact on short-term rate which through the process of portfolio substitution affect long-term interest rates, equity yields and possibly other rates of return on real assets. This process shows that the full effect of monetary policy is subject to long lag since it takes time for monetary policy to be reflected in long-term interest rates, equity yields and components of aggregate demand.

Friedman (1970) begins his analysis of the impact of the changes in the quantity of money on the economy at the moment of long-term balance. Expansionary monetary policy leads to an increase in the global demand. In a short term, it reduces the unemployment rate and increases the inflation rate. However, an increase in prices reduces the actual wages which are more important for an employee in wage-setting behaviour than a nominal wage. It means that an employee will include inflation expectations in his or her demands. In case of monetarists, these expectations are adaptive, i.e. the current inflation and the past inflation are taken into consideration8. An increase in inflation entails greater inflation expectations. Therefore, in their pay negotiations employees will demand an increase in nominal salaries higher than the current inflation. This will result in the increase in the production costs and in the accelerated increase of

prices. Inflation higher than the rate of increase of the money supply leads to the reduction of the real quantity of money in circulation. Thus, the production and unemployment rise. This causes greater pressure on salary increase, which suggests lower inflation and decreasing inflation expectations. Adaptation will be continued as long as the inflation rate becomes equal to the rate of increase in the money supply with the natural unemployment rate. Friedman explains that the long-term Philips curve finally takes the shape of a vertical line.

By treating inflation as a purely monetary phenomenon, monetarists argue that its level is affected only by the quality of the central bank's monetary policy. A considerably increased money supply in long-term causes an increase in prices as the velocity of money is constant, there is a natural unemployment rate and non-monetary factors are decisive for the level of production capacities. Therefore, Friedman recommends using the monetary policy only to keep the level of the previously assumed inflation. Contrary to the Keynesians, he does not use it to stimulate the economic situation or to reduce unemployment. It is considered that the monetary policy should not have a countercyclical character but be totally passive. The will to constantly stimulate employment requires constant increase of the growth rate of the money supply. This would lead to a constant increase in the inflation rate and hyperinflation. Another argument against the active role of monetary policy is the problem of delays in disclosing the consequences of the undertaken activities. Monetarists strongly believe in market powers that automatically restore balance in the economy. Fluctuations in the economic situation are only short-term deviations from the long-term trend and depend on many various factors. Thus, the expansionary economic policy aimed at being ahead of the forecast recession may destabilise the economy, leading to the emergence of consequences in the period of prosperity. Then it will be stimulated even further, which may bear the fruit of faster inflation. In order to fight with it, the

central bank will push the economy into depression with its restrictive policy. Changes in the economy are too dynamic in order to predict exactly the time when the consequences of the decisions made will appear. Even though the principle of proportionality functions for a long term, monetarists admit that in a short term an expansionary monetary policy affects the unemployment rate. But the problem lies in the fact that the determination of the actual natural unemployment rate in a specific economy is extremely difficult. Even if authorities did this, they should not reduce the monetary policy. They can do it by following the policy of increased economic liberty that will ensure greater functioning of market powers and will improve the functioning of the labour market and enterprises.

A new classical school is more radical than monetarism in the assessment of the consequences of using the money supply in the policy of controlling output. Reasonable expectations, constant balancing of markets and errors in the perception of business entities are hypotheses that enabled new classics to formulate their elementary thesis of the ineffective traditional economic policy, including the monetary policy, even in the short-term. They are the greatest defenders of the quantity theory of money and emphasise that money is super neutral in economy.

When increasing the money supply, the central bank may:

1) inform entities of its activities;

2) surprise entities with its activities.

The new classical school divides the monetary policy into the predictable and unpredictable one. In the former case, rationally functioning entities take this information into account in their expectations and fully predict its consequences. An increase in the supply of money does not

lead to increased output as employees who want to maintain the real wage at the constant level demand the increase of wage at the beginning of the next period by the amount of the general increase in prices. The only and immediate effect of stimulating the economic situation with such a monetary policy will be inflation. In the latter case, in turn, the unexpected changes to the quantity of money, so changes which are surprising for private entities, have an influence on the real social product and employment. Increased global demand causes an increase in the prices of goods and services. The erroneous evaluation of the economic situation by businesses (they mistake the increase in the general level of prices with the increase in relative prices) leads to the initial reaction involving greater total supply. The generated output deviates from the potential one while the actual unemployment rate diverges from the natural one. Yet such changes are only temporary. Businesses and employees quickly realise that they have misinterpreted the impulse and they change their expectations. Only the level of prices is increased permanently. Output and unemployment quickly return to their natural levels. Also the level of prices constantly grows. Therefore the central bank should not follow a discretionary monetary policy but rather focus on the stabilisation of prices.

Dynamic incoherence in time and credibility of the central bank are important issues raised by the new classical school. Economists argue that the monetary policy should consider the expectations of business entities in its decisions, so it should not conduct policy other than the declared one. Acting differently, it puts itself in the position of losing credibility which is of key importance to the monetary policy. Short-term benefits resulting from the discretionary policy are much less considerable than losses connected with the costs of inflation and disinflation arising from the lack of rules of conduct. The anti-inflation policy may be credible and as such also effective only when the central bank has full independence.

The best-known critics of the quantity theory of money are the continuators of J.M. Keynes's theory. The new Keynesian school aims at demonstrating that the monetary policy is fit for effective use to influence the level of business activity, i.e. to justify non-neutrality of money in a short- and long-term. By assuming rational expectations and imperfect information, they decide that the economy's deviations from the state of balance constitute a wide-scale market defect. Effective expansionary policy of the central bank relies on sticky prices and wages. Thus, R. Gordon clearly formulated a goal of new Keynesianism: "searching for rigorous and persuasive models of sticky salaries and/or prices based on maximising behaviours and rational expectations".

Some economists of the new Keynesian school concentrate on explaining the rigid prices and nominal pays, while some focus on real ones. An advantage of the new-Keynesian approach is the abandoning of the conditions of perfect competition and the assumption that enterprises function in the conditions of monopoly competition and oligopoly. Nominal sticky prices are explained on the basis of high costs of changes, i.e. menu costs. Enterprises change prices non-simultaneously, according to the Calvo model. But the elementary argument justifying the rigid nominal wages is the conclusion of long-term pay contracts. Even though they increase the instability of the economy, they also reduce losses as constant salary negotiations are costly and time-consuming, and limit the rotation of staff.

Okaro (2014) observed the following advantages of money supply as an instrument of monetary policy in an economy to include;

a) It helps to stabilize price and the monetary system in an economy.
b) It is a useful tool in controlling inflation.

c) It assists in keeping unemployment at low level in the economy in the long-run.

d) It also helps to stimulate economic activities.

Okaro (2014) also identified some disadvantages of money supply as stressed by the Keynesian school of thought as;

a) In the short-run, it may have no powerful effect (insignificant) effect in stimulating economic activities.
b) In the meantime, it may result to slight increase in unemployment in the course of pursuing inflation control policy
c) The lag in the response time of money supply policies can undermine the effectiveness of money supply growth.

ia) Components of Money Supply

The component parts of money supply studied in this research work includes;

a) Currency in Circulation: Currency in circulation refers to total money in circulation outside the banking system. Statistics of currency in circulation are readily available on a month to month basis. They are computed from the monthly returns of commercial banks. Since currency holding reflects a community's demand for transaction balances, its magnitude will fluctuate with business peaks and troughs. The identification of the currency peaks and troughs periods as well as the periodic variations respectively are important for monetary policy decisions. Deposit-money banks' deposits with the central bank and the currency in circulation constitute the reserve money which the central bank must provide at all times.

b) Demand Deposits: In Nigeria, demand deposit is defined to mean the aggregation of deposits of state, local government and parastatals at the CBN, and at the deposit-money banks plus the deposits of the private sector and non-financial public companies at the deposit money banks (Onoh, 2013). Currency and demand deposit liabilities are important monetary aggregates, which feature prominently in money supply equations. Demand deposit is a unique liability of the commercial banks, which is operated through the use of cheques. In many countries it attracts no interest payment or it earns at best a token interest. It is unique because it is the platform upon which commercial banks stand, in the process of multiple expansion of credit money. Onoh (2013) stressed that in the process of multiple credit money creation, the banking system leverages many fold on the initial aggregate deposit monies of the banking system using the bank credit multiplier process.

c) Quasi Money: Savings and time deposits constitutes *quasi-money* or near money. In Nigeria's monetary statistics, quasi money is defined to consist of savings, time deposits and foreign currency deposits of commercial banks and merchant banks, excluding takings from Discount Houses. Savings deposits unlike demand deposits receive market determined interest income. They attract the lowest market rates. Many banks are reluctant to accept small savers because of the high costs of administering those accounts. Time deposits are also called fixed deposits and are placed with the deposit-money banks for a period ranging from 30 days to 360 days or longer. The interest rate is negotiable and fixed. Savings and Time deposits, which are quasi money are important components of the broad money supply, M_2.

ii. Discount Rate Mechanism

This instrument is a facility provided by the central bank which enables the DMBs to borrow reserves against collaterals in form of government or other acceptable securities. The central bank operates this facility in accordance with its role as lender of last resort and transactions are conducted in form of short term (usually overnight) loans. The central bank lends to financially sound DMBs at the policy rate. This rate sets the floor for the interest rate regime in the money market (the nominal anchor rate) and thereby affects the supply of credit, the supply of savings (which affects the supply of reserves and monetary aggregate) and the supply of investment (which affects employment and GDP). The CBN discount window facilities were established strictly in line with the "lender of last resort" role, that the Bank is expected to play. Accordingly, it has continued to provide loans of a short-term nature (overnight) to banks in need of liquidity. The facilities are collateralised by the borrowing institution's holding of government debt instruments and any other instrument approved by the CBN and subject to a maximum quota. The Minimum Rediscount Rate (MRR) is the nominal anchor, which influences the level and direction of other interest rates in the domestic money market. Its movements are generally intended to signal to market operators the monetary policy stance of the CBN. The discount rate mechanism is divided into monetary policy rate and interest rate mechanism.

iia)**. Monetary Policy Rate (MPR)**

The minimum rediscount rate (MRR) was re-christened the Monetary Policy Rate (MPR) in 2006 by the CBN. In this text the term, monetary policy rate (MPR) shall have the same meaning as the minimum rediscount rate (MRR), which has been in use since 1960. MPR is the rate which the central bank charges financial operators for rediscounting first class bills of exchange

before the maturity date. Matured bills are discounted outright with discount houses. First class bills include all government securities such as treasury bills and treasury certificates. The second bill to be introduced in 1962 in the Nigeria bills market was the produce bill finance scheme. The produce bill was introduced to enable the marketing boards to obtain funds from the purchase of produce by drawing 90-days bills of exchange on the Nigerian produce marketing company limited (NPMC). A consortium of commercial banks and Acceptance houses discounted the export produce bill after acceptance by NPMC Ltd. CBN supported the bills by offering rediscounting facilities. The discounting facilities were also made available to other first class bills recognised by CBN. They include those bills drawn on commercial banks and acceptances companies by scheduled licensed buying agents and those bills relating to the export of groundnut of the northern region marketing board. The bills of licensed timber exporters were also honoured by the CBN.

The rediscounting of eligible papers before maturity with the CBN by deposit-money banks in dire need of fund, but which are not interested in interbank borrowing will continue to constitute an important feature of CBN function, as the lender of the last resort and a major player in the money market. By reason of lowering of discount rate, CBN influences the market cost of funds. The MPR as a rediscount instrument can be applied to enhance the marketability of the treasury bills, and certificates or any other assets classified by CBN as rediscount able. All short-term rates are linked formally or informally with the MPR. When business are no longer brisk, deposit money banks and other financial institutions holding excess cash invest the excess cash in short-term debt instrument, which earns some interest rather than hold idle cash which earns no interest. In the event of sudden business opportunities, the debt instruments are exchanged for cash before maturity through rediscount facilities provided by the CBN.

Monetary policy rate is normally fixed at a rate fractionally higher than the treasury bills issue rate. Rediscounting before maturity involves some loss, hence the monetary policy rate is regarded as a penalty rate. The MPR was designed basically to promote the treasury bills markets from where government obtains short-term accommodations to bridge shortfalls in expected revenues. A higher MPR relative to the treasury bills issue rate is meant to discourage the holders of bills from discounting them before maturity. Adequate care is taken in the fixing of the rate in order not to discourage investors from purchasing treasury bills. If the rate is set too high, prospective purchasers of bills will not like to purchase any bill, for fear of sustaining a heavy loss should the bill be rediscounted before maturity. If the CBN wishes to create a tight money supply situation, the MPR is raised. If on the other hand, the monetary policy stance is that of easy money, MPR is lowered to encourage discounting of bills.

When the CBN began operation in July 1959, there was no formal relationship between the lending, deposit and savings rates of commercial banks and the minimum rediscount rate of the bank at the time. It was only in March 1970 that CBN issued a directive to all commercial banks to link interest rate movement with the minimum rediscount rate of the CBN.

Table 2.1 CBN Monetary Policy Committee Decisions Showing MPR (2016/2017)

Dates	Decisions
March, 20-21, 2017	Retain the MPR at 14 per cent; Retain the CRR at 22.5 per cent; Retain the Liquidity Ratio at 30.00 per cent; and Retain the Asymmetric Window at +200 and -500 basis points around the MPR
January 23 and 24, 2017	Retain the MPR at 14 per cent; Retain the CRR at 22.5 per cent; Retain the Liquidity Ratio at 30.00 per cent; and Retain the Asymmetric Window at +200 and -500 basis points around the MPR
November 21 and 22, 2016	Retain the MPR at 14 per cent; Retain the CRR at 22.5 per cent; Retain the Liquidity Ratio at 30.00 per cent; and Retain the Asymmetric Window at +200 and -500 basis points around the MPR
September 19 and 20, 2016	Retain the MPR at 14.00 per cent; Retain the CRR at 22.5 per cent; Retain the Liquidity Ratio at 30.00 per cent; and Retain the Asymmetric Window at +200 and -500 basis points around the MPR
July 25 and 26, 2016	Increase the MPR by 200 basis points from 12.00 to 14 per cent; Retain the CRR at 22.50 per cent; Retain the Liquidity Ratio at 30.00 per cent; and Retain the Asymmetric Window at +200 and -500 basis points around the MPR
23rd and 24th May, 2016	Retain the MPR at 12.00 per cent; Retain the CRR at 22.50 per cent; Retain the Liquidity Ratio at 30.00 per cent; and Retain the Asymmetric Window at +200 and -500 basis points around the MPR 13 Introduce greater flexibility in the inter-bank foreign exchange market structure and to retain a small window for critical transactions.
21st and 22nd March, 2016	Raise MPR by 100 basis points from 11.00 per cent to 12.00 per cent; Raise CRR by 250 basis points from 20.00 to 22.50 per cent; Retain Liquidity Ratio at 30.00 per cent; and Narrow the asymmetric corridor from +200 and -700 basis points to +200 and -500 basis points
25th and 26th January, 2016	To retain the Monetary Policy Rate (MPR) at 11.0 per cent; To retain the Cash Reserve Requirement (CRR) at 20 per cent; To retain the Liquidity Ratio (LR) at 30 per cent; and To retain the asymmetric corridor of +2/-7 around the MPR

Source: CBN Annual Report, 2016/2017.

iib). **Interest Rate Mechanism**

Okaro (2014) described interest rates as the raison d'etre of the modern banking and finance. He noted that this is true either if one believes that such a system exists to make the most efficient use of resources or more cynically, to make profit. Interest rates represents the market mechanism by which funds are lent and they govern who can afford to borrow these funds. They also represent the way in which banks and other financial institutions make money as they react to the return on the use of their resources.

In banking, interest rate is said to be the charge for the use or for borrowing money while in economics it is regarded as payment for the service of capital. The classical economists argued that it is only by postponing consumption that capital can be created and to abstain, however is disagreeable and painful, so the lender is paid a reward in the form of interest.

In theoretical terms there are two basic theories about interest rates, the loanable funds theory and the liquidity preference theory. These are not necessarily opposing, rather the second theory is seen as an extension of the first. Rate of return or rate of interest is the price that savers receive for the use of their money, and also what borrowers have to be paid to use it. Okaro (2014) observed that there are several factors that affect the rate of interest to borrowers. These include time, character of the borrower, cost of arranging and running the loan, loan purpose, Amount to be borrow and lenders loss of benefit or alternatives while the following factors affects the rate of interest paid to depositors namely – Time, the institution and the amount deposited.

Onoh (2013) noted that interest rate instrument is more effective in the industrialised economies, where lenders and borrowers react in an elastic manner by any upwards or downwards variations in the rate of interest, even when the variation is as low as 0.25 basis point i.e a quarter of 1%. If

the interest rate is raised, borrowers respond spontaneously by reducing demand for credit and vice-versa. In the developing economies, where the culture and habit of savings are still to be firmly enthroned, and where borrowers are still to feel the pains or understand that they pay penalty costs for borrowed funds, the interest rate is not a very effective monetary policy instrument of credit control. In the developing economy, most borrowers behave indifferently to any rise or fall of the rate of interest provided that the funds are available.

iii. Reserve Requirements

This instrument is used by the central bank to influence the level of bank reserves and hence, their ability to grant loans. Reserve requirements are lowered in order to free reserves for banks to grant loans and thereby increase money supply in the economy. On the other hand, they are raised in order to reduce the capacity of banks to provide loans thereby reducing money supply in the economy. The CBN complements the use of OMO with a reserve requirement. In this connection, the reserve requirement is an instrument for liquidity management and for prudential regulation. The reserve requirements are the Cash Reserve Ratio (CRR) and the Liquidity Ratio (LR). While the former is defined as a proportion of the total demand, savings and time deposits which banks are expected to keep as deposits with the CBN, the latter refers to the proportion of banks' liquid assets to their total deposit liabilities. The CRR and liquidity ratio have been progressively increased or decreased depending on the complementary role the monetary authority tends to achieve.

iiia). **Cash reserve ratio**

Onoh (2007) observed that the ratio between the banking system's cash reserves and its current liabilities is determined by convention in some countries and by law in others to ensure its

stability and that of the corresponding multiplier. In a country where the ratio of cash reserves to current liabilities is fixed by law, it would require an amendment of the law by the parliament to alter the ratio, hence cash reserve ratio is also referred to as fixed reserved ratio or minimum legal reserve ratio. A deposit-money bank must set aside the mandatory cash reserve from every deposit it receives, before utilizing the balance called the free or excess reserve for the purpose of bank-credit money creation. The volume of free reserves of a bank defines its lending potential or its lending limit, at a given point of time. A bank cannot lend beyond the limit imposed by its excess reserve and the ruling multiplier.

The sum of the legal tender money held by a commercial bank (vault cash), and the current account of the commercial bank held at the central bank is called the deposit-money bank cash reserves. A deposit-money bank's cash reserves constitutes a small fraction of the bank's current account liabilities. Normally, it attracts No interest payment, hence commercial banks tend hold a minimum of cash reserves unless forced by regulation to hold more cash reserves. Moreover, banks customer continues to pay in cash on daily basis which a bank can utilize without having to fall back on its reserves. Since, cash reserves is sterile money, a non-interest yielding assets, banks prefer holding the barest minimum of cash reserves, while the Central Bank tends to set the minimum level of cash reserves at a higher level of ratio to safeguard the liquidity of banks and creditors' interest.

Any change in the banking system credit multiplier invariably affects the economy's level of money supply, in the short and long-run. The bank credit multiplier can only be determined, if the banking system reserves ratio and currency ratios are known. The magnitude of the reserve ratio, **r**, is usually greater than zero but less than 1. It determines the per centage or proportion of

demand deposit a bank must statutorily keep with the central bank, as minimum cash reserves, before any lending or bank credit creation begins.

iiib). **Liquidity ratio**

The liquidity ratio was fixed by the Central Bank of Nigeria (amendment) Act of 1962. It is the percentage of deposit liabilities which the commercial banks must hold in the form of liquid assets. The ratio was fixed at 25 per cent of a commercial bank's total liabilities (Onoh, 2013). CBN monetary policy circulars (MPC) issue from time to time add or subtract assets for the purpose of computing the liquid assets ratio. For instance, MPCs nos. 5 and 7 of the fiscal years 1973/74 and 1975/76 respectively added "call money" and "eligible development stocks" of less than 3 years to maturity, as assets which also qualify for the purpose of computing the liquidity ratio. MPC no. 8 of 1976/77 fiscal year abolished the 40% minimum holding of treasury bills and treasury certificates in terms of total liquid asset ratio. Cash reserve requirements, stabilization securities and advanced deposits for letter of credit were excluded by monetary policy circular no. 8 referred to above and monetary circular paper no.9 of 1977/78 from the computation of the liquid assets ratio. Monetary policy circular no.12 of 1980 further excluded shortfalls of loans to agriculture and residential building construction. CBN insists on a viable liquidity ratio to ensure that commercial banks are sufficiently liquid at all times to satisfy customers' needs and to build up depositor's confidence in the banking system. The formula for calculating the liquidity ratio of a deposit-money bank is as follows;

Liquidity Ratio = Total Specified Liquid assets / Total Current Liabilities

CBN reserves the right to vary the ratio depending on the prevailing economic circumstances. A variation of the liquidity ratio requires a careful assessment of the economic conditions such as

the level of employment, the price level and the rate of growth. An upward variation of the ratio will imply a policy of credit restraint. The policy reduces the excess reserves of the deposit money banks, the platform for multiple credit money expansion by the deposit money banks. The excess reserves become reduced by an amount equal to the aggregate increase in the liquidity ratio. If the objective of varying the ratio is to encourage spending and stimulate aggregate demand, the liquid-asset ratio is lowered. If the intention is to contain inflation, the ratio is raised.

iv. Open Market Operations (OMO)

The most important and flexible tool of monetary policy is open market operations. It is the buying and selling of government securities in the open market (primary or secondary) in order to expand or contract the amount of money in the banking system. By purchasing securities, the central bank injects money into the banking system and stimulates growth whereas by selling securities it absorbs excess money. Thus, if there is excess liquidity in the system, the central bank will in a bid to reduce the money supply sell the government securities such as Treasury Bills. On the other hand, in periods of liquidity shortages, the central bank buys government securities so as to increase money supply. Instruments commonly used for this purpose include treasury bills, central bank bills, or prime commercial paper. The product components under this OMO include; i. Treasury Bills and ii. CBN Treasury Certificates

iva). **Treasury Bills**

OMO enables the central bank to influence the cost and availability of reserves and bring about desired changes in bank credit and money supply. This important instrument of monetary policy has a number of advantages because it is flexible and precise, it is implemented quickly and

easily reversed and the central bank has complete control. The effectiveness of OMO, however, depends on the existence of well developed financial markets that are sensitive to interest rate movements. The OMO was introduced at the end of June 1993 and is conducted wholly on Nigerian Treasury Bills (NTBs), including repurchase agreements (repos). The OMO entails the sale or purchase of eligible bills or securities in the open market by the CBN for the purpose of influencing deposit money, banks' reserve balances, the level of base money and consequently the overall level of monetary and financial conditions. In this transaction, banks subscribing to the offer, through the discount houses, draw on their reserve balances at the CBN thereby reducing the overall liquidity of the banking system and the banks' ability to create money via credit. In implementing the OMO, the Research Department of the CBN advises the trading desk at the Banking Operations Department, also of the CBN, on the level of excess or shortfall in bank reserves. Thereafter, the trading desk decides on the type, rate and tenor of the securities to be offered and notifies the discount houses 48 hours ahead of the bid date. The highest bid price (lowest discount rate quoted) for sales and the lowest price offered (highest discount offer) for purchases, with the desired size or volume, is then accepted by the CBN.

Onoh (2007), commented that if in the course of time, an economy experiences a cash crunch, the inadequacy of cash in the economy may cause the economy to move sluggishly or to stagnate. Inorder to stimulate the economy into greater activities, the central bank may choose to improve the economy's liquidity position by reversing its policy. In the place of a tight monetary policy which encouraged the withdrawal of currency from circulation through sales of government securities (Treasury bill) and which contributed to the cash crunch in the first place, a central bank embarks on a policy reversal, which pushes a large volume of money into circulation (creation of money) through the repurchase of government securities (Treasury bills)

from the bank and the non-bank public. As securities return to the vaults of the central bank, the CBN legal tender money flows into the coffers of the former holders of those securities, who spend a small or a large chunk of the money, depending on the average propensity to consume.

ivb). **Central Bank Treasury Certificates**

Treasury certificate is a short term loan from the Central Bank when the Nigerian federal ministry of finance needs to borrow. With the shortage of treasury bills, a 91 days government-debt instrument, there was need to medium-term debt instruments to generate medium-term funds for the government and to offer government a relatively longer period of indebtedness to the public, than the treasury bills allowed. The introduction of the medium-term instruments was also aimed at satisfying the demand of finance institutions for further investment outlets for the excess cash in their vaults and to diversify money market investments. Onoh (2007), mentioned that in the fiscal year 2001, CBN high-yield certificates with 180 and 365 days tenor, and interest rate of between 19% and 20% were issued for the first time as additional instrument for combating the persisting excess liquidity in the economy. The instrument was targeted at banks, institutional investors and high net worth individuals. The minimum subscription of N250,000 was beyond the reach of small savers. The CBN high yielding certificates failed to appeal to the banks, the home of excess liquidity, because the instrument was not classified as suitable assets for the purpose of satisfying a bank's statutory reserve requirement. Consequently, the first issues were grossly under-subscribed. As it became obvious to CBN, that banks were not participating actively in the purchase of the potent new money market instrument, another assist instrument to OMO, the certificates were redesignated as eligible for the purpose of satisfying the statutory reserve requirements of CBN.

2.1.1.4 Other Instruments

vi. Exchange Rate

The balance of payments can be in deficit or in surplus and this can affect the monetary base, hence the money supply, in one direction or the other. By selling or buying foreign exchange, the central bank ensures that the exchange rate is at an optimal level. The real exchange rate when misaligned affects the current account balance because of its impact on external competitiveness.

vii. Prudential Guidelines

The central bank may require DMBs to exercise particular care in their credit operations in order to achieve specified outcomes. Key elements of prudential guidelines remove some discretion from bank management and replace them with rules.

viii. Moral Suasion

The central bank issues licenses to DMBs and regulates the operation of the banking system. Thus, it can persuade banks to follow certain policies such as credit restraint or expansion, increase savings mobilization and promote exports through financial support, which otherwise they may not do, on the basis of their risk/return assessment. The CBN adopts this approach as a means of establishing two-way communication with the banks, thereby creating a better environment for the effectiveness of monetary policy. The main avenue of contact is the Bankers' Committee, which meets two-monthly. This dialogue with banks was further expanded in November 2000 to include other stakeholders comprising key government officials, financial market operators, academics, etc, under the umbrella of the Monetary Policy Forum. The

objective of the Forum is to enhance the transparency of the Bank's monetary policy-making process.

ix. **Special or Mandatory Deposits**

In order to avoid frequent variations of the cash reserve ratio, regarded as a long-term instrument of policy, but determined to enforce credit squeeze, the bank of England had to devise a new instrument to support the traditional moral suasion. A new tool called "Special" or "Mandatory" deposits from the commercial banks in times of excessive credit expansion. This short-term instrument of monetary control does not count as a part of the statutory reserve requirement of a commercial bank and does not offer any credit base to the commercial banks. The instrument is variable from bank to bank and adjustable from time to time to reflect gains or losses in deposits of individual banks. It can be varied at short notice and the interest rate they attract are not higher than those earned by treasury bills.

The Nigerian monetary authorities borrowed the device of special or mandatory deposit from the bank of England. Banking Decree no. 50 of 1968 empowered the CBN to call for special deposits from commercial banks in order to reduce the excess liquidity of the bank. The relative measure achieved by the policy in the U.K must have encouraged the Nigeria monetary authorities to adopt it, in the hope that the CBN having been designed after the liberal banking system of U.K may apply the instrument with the same degree of success too. "Special Deposit" also earned some interests in Nigeria. The objective of the policy is to reduce the credit creating base of commercial banks without jeopardizing their ability to earn income from deposits. The first call for "Special Deposit" by the CBN was made in June 1970. Other mandatory deposits have since been added. They are called "Penalty Deposits". Banks which short lent their

mandatory sectoral credit allocations were compelled to deposit the shortfall with the CBN. Usually, they attract no interest payment. However, this mandatory deposit has been abandoned by the monetary authorities since the introduction of the Single Treasury Account (TSA) in 2012 by the federal government of Nigeria.

2.1.2 Framework for Monetary Policy in Nigeria

Monetary policy in Nigeria can be discussed under the institutional framework as follows:

Monetary Policy before 1986 (Adekanye, 1984)

Monetary policy after 1986

Regime of Short-term Monetary Policy Framework (1986 – 2011)

Regime of Medium-term Monetary Policy Framework (2002 – 2005)

Post-Consolidation Monetary Policy Framework (2006 – 2007)

New Era of Monetary Policy (2008 – Till Date) (Onyeiwu, 2012, CBN, 2012)

❖ **Monetary Policy Before 1986**

The economic environment that guided monetary policy before 1986 was characterized by the growing importance of the oil sector, the expanding role of the public sector in the economy and the over-dependence on the external sector. In order to maintain price stability and healthy balance of payments position, monetary management before 1986 depended on the use of direct instruments such as credit ceilings, selective credit controls or credit rationing, administered interest rates as well as the prescription of cash reserve requirements and special deposits (Akanbi and Ajagbe, 2012; Adeoye, Ojapinwa and Odekunle, 2014; CBN, 2009).

The use of market - based instruments were not feasible at that point because of the underdeveloped nature of the financial markets and the deliberate restraint on interest rates (Nnanna, 2001). The most popular instrument of monetary policy was the issuance of credit rationing guidelines, which primarily set the rates of change for the components and aggregate commercial bank loans and advances to the private sector. The sectoral distribution of bank credit in CBN guidelines was to stimulate the productive sectors and thereby stem inflationary pressures. The control of interest rates at relatively low levels was done mainly to promote investment and growth. Occasionally, special deposits were imposed to reduce the amount of free reserves and credit- creating capacity of the banks (Nwankwo, 1980).

As noted by Okafor (2000) minimum cash ratios were stipulated for the banks in the mid- 1970s on the basis of their total deposit liabilities, but since such cash ratios were usually lower than those voluntarily maintained by the banks and they proved less effective as a restraint on their credit operations.

From the mid -1970s, according to CBN Brief, (1999) it became increasingly difficult to achieve the aims of monetary policy. Nnanna (2002), observed that banks aggregate loans to the productive sectors between 1972 and 1985, average 40.7% to total credit, about 8.7% points lower than the stipulated target of 49.4%. Generally, monetary aggregates, government fiscal deficit, GDP growth rate, inflation rate and the balance of payments position moved in undesirable directions (CBN, 1993).

Compliance by banks with credit guidelines was less than satisfactory. The monetary control framework, which relied heavily on credit ceiling and selective credit controls, increasingly failed to achieve the set monetary targets as their implementation became less effective with

time. The rigidly controlled interest rate regime, especially the low levels of the various rates, encouraged monetary expansion without promoting the rapid growth of the money and capital markets (CBN, 2009). The low interest on government debt instruments did not sufficiently attract private sector savers and, since the CBN was required by law to absorb the unsubscribed portion of government debt instruments, large amounts of high - powered money were usually injected into the economy. In the oil boom era, the rapid monetization of foreign exchange earnings resulted in large increase in government expenditure which substantially contributed to monetary instability (Onyeiwu, 2012).

In the early 1980s, oil receipts were not adequate to meet increasing levels of demand and since expenditures were not rationalized, government resorted to borrowing from the Central Bank to finance huge deficits. This also had adverse implications for monetary management (CBN 2002.)

- **Monetary Policy since 1986**

In line with the economic deregulation embodied in the SAP, there was a paradigm shift from the hitherto repressive direct monetary control method to an indirect approach anchored on the use of market instruments in monetary management (Anderson, 1988; CBN, 2009; Adeoye, Ojapinwa and Odekunle, 2014; Chuka, 2009).

This was borne out of the desire to eliminate the distortions and inefficiencies in the financial system caused by the prolonged use of administrative controls and the need to engender competition among banks and other operators in the financial system. Two major policy regimes of short and medium term frameworks can be identified.

a. Regime of Short- Term Monetary Policy Framework (1986-2001)

Consistent with the broad objectives of monetary policy, a number of monetary targets and instruments were adopted during the short- term monetary policy framework (1986-2001). Open

market Operations was conducted wholly using the Nigerian Treasury Bills (NTBs), and it continued to be the primary instrument of monetary policy (Nnanna, 1995). This was complemented by the cash reserve requirement (CRR) and the liquidity ratio (LR).

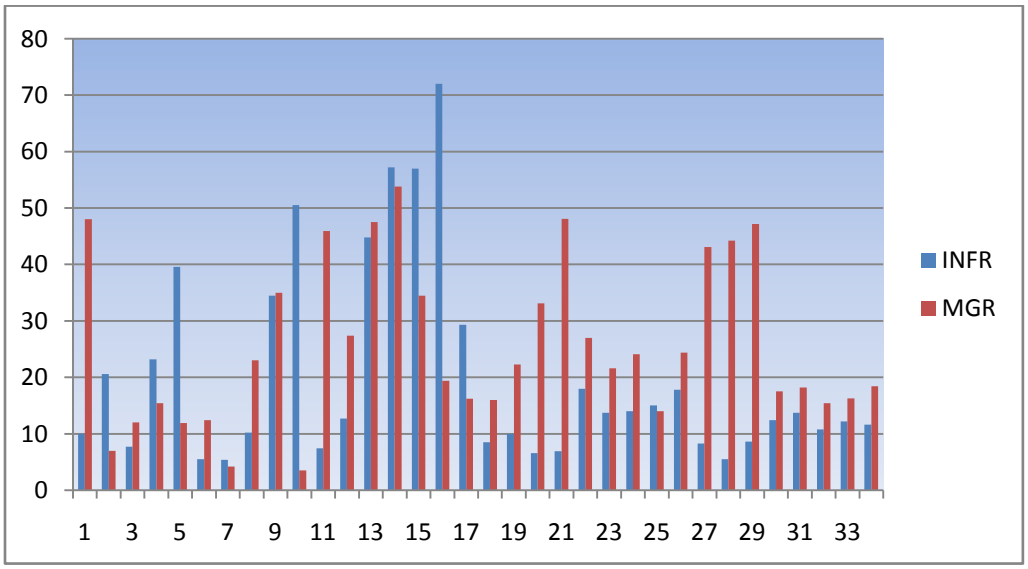
In the view of Dalgaard (1987), the CRR was increased from 6 percent in 1995 to 12.5 percent in April, 2001. As observed by Mishkin (1999) other policy instruments employed included the discount window operations, mandatory sales of special NTBs to banks and a requirement of 200 percent treasury instrument to cover for banks foreign exchange demand at the Autonomous Foreign Exchange Market (AFEM). Interest rate policy was deregulated through the proactive adjustment of minimum rediscount rate (MRR) to signal policy direction consistent with liquidity conditions.

Ojo (2000), noted that in spite of the reforms in the articulation and execution of monetary policy during this period, most of the monetary and financial targets were substantially missed. The actual growth rates in broad measurement of money supply (M_2) and aggregate bank credit for the years, 1999-2001, were higher than the set targets by wide margins. Although, inflation performed better in two of the three years, hence the inflation rate in 1999 fell to 6.62% from 9.98% it was in 1998; in 2000 it was 6.94% while in 2001 it skyrocketed to 18.03%, aggregate output was sluggish during the period.

As suggested by Gbosi (2001), the outcomes could be attributed to the expansionary fiscal operations of the three-tiers of government and the resultant liquidity overhang, as well as lack of coordination of monetary and fiscal policy implementation.

Figure 2.2

Graphic Illustration of the movement of Inflation and Monetary Growth in Nigeria 1980 - 2016



Source: Author's computation, 2018

The Chart above depicts the movements/fluctuations of Money Supply and Inflation Rate in Nigeria between 1980 – 2016. It can be observed that in 1980 money growth was more than that of inflation, in 1982, 1984, 1985; inflation growth was much more than money growth. This trend continued till 1997 when the rate of money growth became more than inflation growth rate. The trend of inflation continue to surged till 2015 and became very high in 2016.

b. Regimes of Medium- term Monetary Policy framework (2002-2005)

In 2002, the CBN commenced a two-year medium- term monetary policy framework, aimed at freeing monetary policy from the problem of time inconsistency and minimizing over- reaction due to temporary shocks (CBN, 2009; Bernanke, 2002).

The major objectives of monetary policy since 2002 to 2003 have been to subdue inflation to a single-digit level and maintain a stable exchange rate of the naira (CBN Briefs, 2003). The OMO has continued to be primary tool of monetary policy, and it is complemented by reserve requirements, discount window operations, foreign exchange market intervention and injection/ withdrawal of public sector deposits in and out of the Deposit Money Banks (DMBs). Here, the inflation rate was 13.68% in 2002 while in 2003 rose to 14.02%.

Maxwell (2002), noted that the measures taken to strengthen the banking sector and consolidate the gains of monetary policy included the introduction of a 13-point reform agenda in the banking sector in July 2004 (the key point of which was the N25 billion minimum capital base for DMBs).

Between 2004 and 2005, monetary policy and credit guidelines were fine-tuned in the light of changing environment, new policy measures introduced included:

- Maintenance of a tight exchange rate band of plus/ minus 3 per cent,
- Two week maintenance period of cash reserve requirement and
- The injection/withdrawal of public sector deposits from the DMBs.

Bennett and Dixon (2001) observed that there was an upward adjustment of the CRR by a total of 150 basis points and subsequent reduction followed. The Monetary Policy Rate (MPR) was also used by the CBN as a nominal anchor to influence the level and direction of other interest rates. The changes indicated whether the monetary authorities wished to adopt a policy of monetary tightening or otherwise. The rate was 16.5% in December 2002, 15 percent in June 2004, 13 percent in December 2005 and 10 percent in December 2006.

In his work, Allan (2004) maintained that the various measures put in place, complemented by improved fiscal discipline at the federal level, impacted positively on the monetary aggregates in

2004 and 2005, resulting in the achievement of set targets during the period. The growth rate of real GDP also increased substantially, exceeding set targets in 2003-2005.

c. Monetary Policy implementation Post-Consolidation (2006-2007)

Soludo (2006) postulated that the key features of the monetary conditions during the period, 2006 to 2007 included: persistence of excess liquidity despite reversal of historic conditions, for instance, ways and means and emergence of a new but very important source of excess liquidity- increased private inflows. The objectives of monetary policy during the period remained unchanged. The monetary policy strategy included:

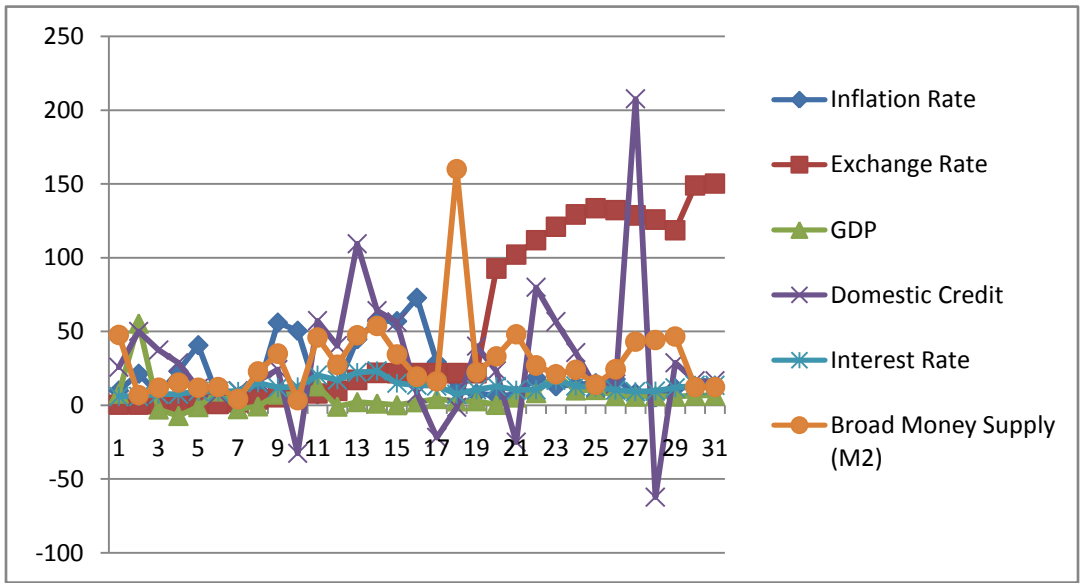
- Zero tolerance on ways and means advances;
- Gradual run-down of CBN holding of TBs:
- Aggressive liquidity mop-up operations- frequent OMO sales supported by discount window operations;
- Unremunerated reserve requirements;
- Increased coordination between the Bank and the Fiscal Authorities;
- Restructuring of debt instruments into longer tenor debts;
- Increased deregulation of forex market; and
- Occasional forex swap.

In recent times, the CBN has been committed to ensuring price and exchange rate stability through restrictive monetary policy stance. This, it did with the introduction of the Wholesale Dutch Auction System (WDAS) and non- discountable special Nigerian Treasury Bills (NTBs). In 2006, the CBN also introduced a new monetary policy implementation framework which establishes an interest rate corridor of three percentage points above and below a short-term Monetary Policy Rate (MPR). The MPR fixed at 10 percent in 2006 was reduced and retained at

8.0 percent in August 2007. Consequently, the annual headline inflation rate which averaged 17.9 percent in 2005 stood at 8.4 percent in 2006. Inflation stayed within single-digit of 6.4 percent in the first half of 2007. The exchange rate on the other hand has also fared well relatively. Apart from a drop in the market premium in the first week June 2006 from N24 to N9.00, the naira exchange rate appreciated from US$1/N151 in March 2006 to US$1/N126,88 at end- March 2007 and to US$N151 in March 2006 to US$1/N126.88 at end- March 2007 and to US$1/126.05 at end- June, 2007 (Central Bank of Nigeria Communiqué of the Monetary Policy Committee: various issues, Nenbe and Madume, 2012).

Notably, the inflationary trend here changed from 17.82% it was in 2005 to 8.34% in 2006 and 5.50% in 2007 (CBN Briefs; 2007). It stood 8% in 2014, 9.55% in 2015 and rose to 18.55% in 2016. On domestic consumer prices, although headline inflation remained practically stable, in late 2014, it crept towards the upper limit of the Bank's tolerance range of 6-9 percent. At 8.7 percent in April 2015, the successive uptick in the last five months is indeed breeding concern and needs to be closely monitored.

Fig. 2.3Trends Of Selected Macroeconomic Variables In Nigeria (1986 – 2016)



Source: Author's computation

The Chart in fig. 2.3 depicts the trends of selected macroeconomic variables in Nigeria between 1986 – 2016.

It reveals that comparatively domestic credit has been surging up from 1986 to 2012 and later took downward trend afterwards; exchange rate volatility is equally visible based on its upward trend. Inflation rate has been relatively stable; whereas economic growth (GDP) has been relatively low compared with broad money supply.

d. Monetary Policy from 2010

The Monetary Policy Committee (MPC) met on 4th and 5th January, 2010 to review domestic economic conditions in 2009 and the challenges faced by the Nigerian economy against the backdrop of developments in the international economic and financial sector policies for 2010.

From Economic Confidential (2010) it was observed that the committee noted that commodity prices, including crude oil prices, have resumed an upward trend due largely to the fiscal and monetary stimuli, and the prospect of economic recovery renewed concerns about the resurgence of inflation in the near- term. The committee further noted that emerging and developing market economies, on their part, have continued to show strong resilience to the financial crises and recorded positive growth rates despite the harsh international economic and financial environment in 2009 (CBN, 2010).

On the domestic scene, the MPC underscored the need for strengthening on- going reform efforts in the banking sector aimed at engendering desirable medium term economic growth path consistent with price and financial stability. It further underlined the need to fast track the proposed reforms in some key sectors of the Nigerian economy, and in particular, the power sector, to attract the much- needed private sector/ foreign investment. This, the committee noted, was necessary because of the benefits in terms of the growth-enhancing and employment creating potentials that these reforms and opening- up of the sectors would have on the rest of the economy.

Sanusi (2010) opined that in the light of the above, the monetary policy rate will remain unchanged at 6% with the asymmetric corridor of interest rate remaining at 200 basis points above the MPR. Secondly, that CBN will extend the guarantee on all inter- banks transactions up till December 31, 2010. However, the CBN has the discretion to terminate the guarantee on a case-by-case basis as part of the ongoing reform process.

Thirdly, the MPC approved the monetary programme for 2010/2011 and the monetary credit, Foreign Trade and Exchange Guidelines for Fiscal Years 2010/2011.

e. Current Monetary Policy Stance in Nigeria and Its Implications

The Central Bank of Nigeria unexpectedly cut its benchmark interest rate by 200 bps to 11 percent on November 24th 2015. It is the first reduction since 2009 aiming to boost growth amid high inflation. Policymakers also widened the interest rate corridor by 200 bps above and 700 bps below the benchmark interest rate, bringing the cost of borrowing to commercial lenders to 4 percent and cost of lending to 13 percent. The cash reserve ratio was also lowered to 20 percent from 25 percent. Interest Rate in Nigeria averaged 10.02 percent from 2007 until 2015, reaching an all time high of 13 percent in November of 2014 and a record low of 6 percent in July of 2009, (Emefiele, 2015).

Nigeria Lowers Key Rate to 11%

The Central Bank of Nigeria unexpectedly cut its benchmark interest rate by 200 bps to 11 percent on November 24th, 2015. It is the first reduction since 2009 aiming to boost growth amid high inflation. Policymakers also widened the interest rate corridor by 200 bps above and 700 bps below the benchmark interest rate, bringing the cost of borrowing to commercial lenders to 4 percent and cost of lending to 13 percent. The cash reserve ratio was also lowered to 20 percent from 25 percent.

The Committee acknowledged the continued fragile global economic environment, including the possibility of monetary policy normalization in the United States; poor outlook for commodity prices and further slowdown in the Emerging Markets and Developing Economies. The MPC also noted the fragility of the domestic macroeconomic environment; reflected partly in low output growth, soft oil prices, low credit to the high employment elastic sectors of the economy and sustained inflationary pressure, which however, softened moderately in October. The MPC was, particularly, concerned that the previous liquidity injections embarked upon through

lowering of the Cash Reserve Ratio (CRR), in the last MPC, has not transmitted significantly to improved credit delivery to key growth and employment in sensitive sectors of the economy. Rather, more credit was to sectors with low employment elasticity. The Committee restated its commitment to evolve and implement measures that would be supportive of consolidating and strengthening in output growth with an eye on price stability. The Committee, however, recognized the limits of monetary policy under conditions of huge infrastructure gap and significant global financial market fragilities. While noting the imperative of complementary fiscal policies to augment monetary policy, under the circumstance, monetary policy must remain bold in charting the desired course that would stimulate sustainable output growth in Nigeria (Emefiele, 2015).

Given the situation, the MPC emphasized the necessity of focusing on financial market stability and proactive engagement of policy and administrative levels needed to support the environment in which market institutions operate. On their part, market institutions are encouraged to employ more stringent criteria in evaluating their portfolio and business decisions.

The MPC considered that although, headline inflation had remained at the borderline of single digit, the observed moderation, especially in the month-on-month inflation, provided some room for monetary easing to support output in the short to medium term, while keeping in focus the primacy of price stability. In effect, the Committee will continue to monitor developments around the Naira exchange rate, interest rates, and consumer prices, even as targeted measures are needed to channel liquidity to the key sectors of the economy.

In consideration of the weakening fundamentals of the economy, particularly the low output growth, rising unemployment and the uncertainty of the global economic environment the MPC decided to:

(i) Reduce the CRR from 25.0 percent to 20.0 percent;

(ii) Reduce the MPR from 13.0 percent to 11.0 percent;

(iii) Change the symmetric corridor of 200 basis points around the MPR to an asymmetric corridor of +200 basis points and -700 basis points, around the MPR (CBN, 2015).

In Nigeria, short-term growth prospects weakened further as the pace of economic expansion lost some momentum in the first quarter of 2015. On an annualized basis, the outlook for 2015 projects that growth will decelerate to 5.5 percent from 6.2 percent in 2014. Recently released data from the National Bureau of Statistics (NBS) indicated that, at 3.9 percent in 2015Q1, economic growth shed approximately 200 basis points from 5.9 percent recorded in the last quarter of 2014. This moderate growth was largely attributable to the 5.6 percent expansion in non-oil GDP, which regardless of an inherent 85 basis points decline eclipsed the 8.1 percent shrinkage of oil GDP. The growth in the non-oil GDP reflected growths in the trade, crop production, construction, telecommunications, and other services sub-sectors. The contraction in the oil sector was partly due to strong headwinds from declined oil prices on investment and productivity in that sector. While the slowing pace of growth is a concern, it is important to highlight that it is congruent with developments in most oil exporting countries, and heightens the need for renewed and intensified drive to reduce the dependence of the economy on primary commodities, especially crude oil, and towards value-added products. In the interim, the MPC is of the view that the outlook will brighten in the near-to short-term following the reduced

uncertainty that accompanied the success at the last elections and reinforced by the progressive dismantling of insurgency (CBN, 2015).

On domestic consumer prices, although headline inflation remained practically stable, in late 2014, it crept towards the upper limit of the Bank's tolerance range of 6-9 percent. At 8.7 percent in April 2015, the successive uptick in the last five months is indeed breeding concern and needs to be closely monitored.

The MPC at its fourth meeting of the year 2015 left existing monetary and Foreign Exchange (FX) policies unchanged despite the towering inflation rate and unstable FX market. Existing monetary policies are likely to be sustained till the next monetary policy meeting scheduled for September. However, the intense volatility at the FX market calls for quicker policy actions in the interim, to guard the capital markets and the impact on the economy at large.

Another significant event that impacted financial markets is the increase in cash reserves ratio (CRR) of public sector fund to 75% from 50% at the first monetary policy meeting (MPC) - further tightening of systemic liquidity. According to the banking regulator, the decision was largely on concerns over the falling fiscal buffers following the continuing decline in oil revenue; rundown of reserves and depletion of excess crude oil savings; and falling portfolio and foreign direct investment inflows driven by the commencement of the QE3 tapering by the US Fed. Also, the widening gaps between the official and BDC exchange rates as well as the steady increase in core inflation were amongst other reasons considered. In its subsequent MPC meeting held in March, the CBN raised CRR on private sector fund to 15% from 12%. During the period, the banking regulator (CBN) revealed plans to implement a National Financial Inclusion Strategy to reduce adult Nigerians excluded from financial services to 20% by 2020 from 46.3% recorded

in 2010. The number of Nigerians included in the formal sector is projected to increase to 70% in 2020 from 36.3% in 2010. This goal will be pursued through a broad range of coordinated intervention and reforms targeted at transforming the existing knowledge. Furthermore, CBN released guidelines for the operations of the foreign exchange market. The aim was to bring ease to the management of the retail Dutch Auction System (RDAS) introduced in September 2013 having discontinued the operation of the Wholesale Dutch Auction System (WDAS). A designated account called authorized Dealers retail Dutch Auction System (rDAS) account was created for authorized dealers who are required to fund the account by the close of business on every Thursday for Monday rDAS auction session, while funding for Wednesday auction session shall be done on Mondays. The funding is inclusive of a 1 percent commission. Essentially, the transition to rDAS from wDAS is to allow the apex bank better monitor sources of forex demand and possibly discourage speculative demand. A uniform bank account opening forms for customer was introduced by the banking authorities.

2.1.3 Monetary Policy and the Economy: A General Overview

As highlighted by Madu (1998), there is the fact that the market mechanism alone cannot perform all economic functions without other supporting policies – monetary policy inclusive. Therefore, such policy is needed to guide and regulate the value and supply of money in an economy in consonance with the level of economic activities; such could be like the relationship that exists between the demand for and the supply of goods and services in a market economy. Lewis (1976), shows that even in the most advanced capitalist state today (USA), there is an increasing believe that government should intervene in protecting the economy against the price system.

However, the efficiency of monetary policy depends on the following factors: the problem of time lag, forecasting accuracy, non-banking financial intermediaries (structural changes in the financial market), and underdeveloped money and capital markets. Having this, in the view of Nzota (2000), monetary policy is therefore regarded as the key tool in economic management and in macroeconomic stabilization of prices. Its adjustment process in a developing country where inflation pressure is so high has become a major policy target.

So many literatures have been based on the premise that the internal and external prices of goods and services do fluctuate between high and low rates. As observed by Gbosi (1997), monetary policy do influence the level of money stock and or interest rate, that is the availability, value and cost of credit in consonance with the level of economic activity. Macroeconomic aggregates such as output, employment and prices are in turn affected by the stance of monetary policy through a number of ways including interest rate, credit, wealth or portfolio and exchange rate channels.

The monetary authorities apply their discretionary power in influencing the money stock and interest rate to make money either more expensive or cheaper depending on the prevailing economic conditions and policy stance in order to achieve price stability. Chandler (1976) concluded that monetary policy is nothing but a deliberate attempt to control money supply and credit conditions for the purpose of achieving certain broad economic objectives. Equally, Vaish (1980) defined monetary policy as a deliberate exercise of the monetary authority's power to induce expansion or contraction in the money supply in order to help dampen the service of business cycle and bring the nation's output and employment to the desired level. Nnanna (2001) defined monetary policy as an attempt to regulate the economy by regulating the supply of money and the terms and availability of credit. Specifically, it is designated to regulate the

availability (quantity), cost and direction of credit in order to attain the stated national economic objectives as said earlier. In the same vein, Jhingan (2004) held that monetary policy is a measure which deals with deliberate control of money supply by the monetary authorities with a view of achieving some stated economic objectives.

Ndugbu (2002), maintained that monetary policy is not an end in itself, but a means to achieving a certain end. He strongly believes that in Nigeria, the aim of our developmental efforts is to bring about improvement in living conditions of the populace. The problem is not merely choosing or setting the objectives but to coordinate and ensure consistency of the objectives. He further explained that conflicts exist among the objectives. For instance, the pursuit of accelerated economic growth may lead to rapid importation of capital goods, hence pressures on the Balance of Payments (BoP).

In the same vein, the objective of growth and price stability could also be conflicting. Considering this fact therefore, inflationary policies may accelerate the rate of growth in the short-run which may not be sustainable in long-run. So a country's commitment to full employment tends to be inflationary and if an increase in money supply is not accompanied by a corresponding change in output, the general price level would rise. In order to ensure the realization of goals of price stability and economic growth, the CBN deploys its monetary policy instruments in such a way to ensure optimality in inflation and growth outcomes. It follows that low and stable inflation has become the core mandate for most Central Banks across the globe for the obvious reasons that it has costs on the economy (Okafor, 2009).

2.1.4 Monetary Policy Transmission Mechanism

There are different transmission channels through which monetary policy affects economic activities and these channels of transmission have been broadly examined under the Monetarist and Keynesian schools of thought. The Monetarist postulates that change in the money supply leads directly to a change in the real magnitude of money. Describing this transmission mechanism, Friedman and Schwartz (1963) say an expansive open market operations by the Central Bank, increases stock of money, which also leads to an increase in Commercial Bank reserves and ability to create credit and hence increase money supply through the multiplier effect. In order to reduce the quantity of money in their portfolios, the bank and non-bank organisations purchase securities with characteristics of the one sold by the Central Bank, thus stimulating activities in the real sector. This view is supported by Tobin (1978) who examines transmission effect in terms of assets portfolio choice in that monetary policy triggers asset switching between equity, bonds, commercial paper and bank deposits. He says that tight monetary policy affects liquidity and banks ability to lend which therefore restricts loan to prime borrowers and business firm to the exclusion of mortgages and consumption spending thereby contracting effective demand and investment (Onyeiwu, 2012).

Conversely, the Keynesians posit that change in money stock facilitates activities in the financial market affecting interest rate, investment, output and employment. Modigliani(1963) supports this view but introduced the concept of capital rationing and said willingness of banks lending affects monetary policy transmission. In their analysis of use of bank and non bank funds in response to tight monetary policy, Oliner and Rudebush (1995) observe that there is no significant change in the use of either but rather larger firms crowd out small firms in such times and in like manner, Gertler and Gilchrist (1991) supports the view that small businesses

experience decline in loan facilities during tight monetary policy and they are affected more adversely by changes in bank related aggregates like broad money supply. Further investigation by Borio (1995) who investigated the structure of credit to non government borrowers in fourteen industrialised countries observe that it has been influenced by factors such as terms of loan as interest rates, collateral requirement and willingness to lend.

2.1.5Monetary Policy in Nigeria

The primary goal of monetary policy in Nigeria has been the maintenance of domestic price and exchange rate stability since it is critical for the attainment of sustainable economic growth and external sector viability (Sanusi, 2002).

Adefeso and Mobolaji (2010) employed Johansen maximum likelihood co-integration procedure to show that there is a long run relationship between economic growth, degree of openness, government expenditure and M2. Ajisafe and Folunso (2002) observe that monetary policy exerts significant impact on economic activity in Nigeria.

Kogar (1995) examine the relationship between financial innovations and monetary control and concludes that in a changing financial structure, Central Banks cannot realize efficient monetary policy without setting new procedures and instruments in the long-run, because profit seeking financial institutions change or create new instrument in order to evade regulations or responds to the economic conditions in the economy. Examining the evolution of monetary policy in Nigeria in the past four decades, Nnanna (2010) observes that though, the Monetary management in Nigeria has been relatively more successful during the period of financial sector reform which is characterized by the use of indirect rather than direct monetary policy tools yet, the effectiveness of monetary policy has been undermined by the effects of fiscal dominance,

political interference and the legal environment in which the Central Bank operate. Busari et al(2002), state that monetary policy stabilizes the economy better under a flexible exchange rate system than a fixed exchange rate system and it stimulates growth better under a flexible rate regime but is accompanied by severe depreciation, which could destabilize the economy meaning that monetary policy would better stabilize the economy if it is used to target inflation directly than being used to directly stimulate growth. They advised that other policy measures and instrument are needed to complement monetary policy in macroeconomic stabilization. In the same stride, Batini (2004) stresses that in the 1980s and 1990s monetary policy was often constrained by fiscal indiscipline. Monetary policies financed large fiscal deficit which averaged 5.6 percent of annual GDP and though the situation moderated in the later part of the 1990s, it was short lived as he described the monetary policy subsequently as too loose which resulted to poor inflation and exchange rate record. Folawewo and Osinubi (2006) investigate how monetary policy objectives of controlling inflation rate and intervention in financing of fiscal deficits affect the variability of inflation and real exchange rate. The analysis is done using a rational fiscal role of exchange rate. The paper reflects that the effort expectation framework that incorporates the ability of the monetary authority to influence the finance of government fiscal deficit through the determination of the inflation-tax rate affects both the rate of inflation and the real exchange rate, thereby causing volatility in their rates. The paper reveals that inflation affects volatility of its own rate as well as the rate of real exchange. The policy implication of the paper is that monetary policy should be set in such a way that the objective it is to achieve is well defined. Sanusi (2002) says that the ability of the CBN to pursue an effective monetary policy in a globalised and rapidly integrated financial market environment depends on several factors which include, instituting appropriate legal framework, institutional structure and conductive

political environment which allows the Bank to operate with reference to exercising its instrument and operational autonomy in decision-making, the degree of coordination between monetary and fiscal policies to ensure consistency and complementarily, the overall macroeconomic environment, including the stage of development, depth and stability of the financial markets as well as the efficiency of the payments and settlement systems, the level and adequacy of information and communication facilities and the availability of consistent, adequate, reliable, high quality and timely information to Central Bank of Nigeria.

2.1.6 Monetary Policy and Price Stability in Nigeria

The cardinal focus of monetary policy is to influence the availability, cost and direction of credit in order to achieve specific economic goals. Monetary policy is not only a part of overall economic policy that regulates the level and growth of money stock and credit in the economy; it is also part of an adjustment process/policy to stimulate sustainable economic growth and development (Okowa, 1995; Gbosi, 1998; and, Anyanwu, 1993).

Emeka (2005), opines that the pursuit of price stability invariably implies the indirect pursuit of other objectives such as economic growth, etc, which only can take place under conditions of price stability and allocative efficiency of financial markets. The primary goal of monetary policy in his view is to ensure that money supply is at a level that is consistent with the growth rate.

Another evidence is that of the Financial Press in Nigeria as reported by Christopher (2006), that investors generally believed that monetary policy and macroeconomic events have a large influence on the unpredictability of the stock price, which further implied that macroeconomic variables could exert shocks on share returns and thereafter influence investors' decisions. To

buttress this view, Akinnifesti (1987), emphasizes that there is a relationship between exchange rate, interest rate and stock prices fluctuation. He noted that the impact of naira depreciation as a monetary policy tool goes a long way in increasing stock prices.

Iyabode (1999) argues that in the later 1980s, as a result of Structural Adjustment Programme (SAP), the effect of wage increases created a cost-push effect on inflation which in the long-run, was structural feature of the economy coupled with the growth in money supply that translated into increases in general prices.

Friedman (2003), maintains that, inflation has a monetary character because it results from the rise in the quantity of money, though the changes in prices may not show up at the same time as the rise in the quantity of money. The concept of inflation, which models money supply as an exogenous variable with causality running from money supply to prices, characterized the works of Cogan, (1995) and Neaime, (2008), among others.

Fakiyesi (1996), observes in his study of inflation in Nigeria, that inflation depends on growth in broad money (M_2), the rate of exchange (EXCR) of the naira vis-a-vis the dollar, the growth of real income (GRI), the level of rainfall (R) and the level of anticipated inflation which is based on the previous year's level of inflation $_{(Pi-1)}$

2.1.7 Limitations of Monetary Policy in Nigeria

The problems of monetary policy in Nigeria, as viewed by Krugman (1993) have been as follows:

- There is the existence of a large non-monetized sector which hinders the success of monetary policy. Most of the people live in the rural areas where there is absence of

financial institutions and knowledge especially in the Northern part of the country. Thus monetary policy failed to affect the lives and activities of the people in those areas of the economy.

- The money and capital markets are both inadequate and underdeveloped. These markets lack in securities and bills which limit the success of monetary policy. In the word of Obaseki (1991), most of the banks in the banking system posses high liquidity so that they are not affected by the credit and hence monetary policies of the monetary authorities.
- There are the large scale operations of non-bank financial intermediaries like Insurance companies most of which are not under the control of the Central Bank. In addition, bank money or demand deposits comprise a small portion of the total money supply in the country (Ogwuma, 1999; Oresotu, 1993; Ojo, 1992; Ahmed, 1992).
- Another limitation as observed by Nkoro (2003), is the rich class. Some of these people do not deposit money with the banks but use it in speculations and conspicuous consumptions.

2.1.8 The Need for Autonomy in Monetary Management in Nigeria

In several countries like Germany, USA, Australia, New Zealand, etc, the central bank is given a specific mandate to maintain price stability consistent with reasonable economic growth and development without interference from the political corridor (Adeleye, Ayorinde and Ajinaja, 2013; Lybek, 2004)

Usually, the achievement and maintenance of price stability requires the selection of appropriate instruments to achieve these stated goals. The setting of explicit goals provides the public the

opportunity for assessing how well the central bank is performing. The central bank would determine what the variables would be in order to know the course of action to pursue through forecasting. A critical element of accurate forecasting and performance appraisal is the availability of reliable data. Yet, in the process of deriving optimal money stock, there arises many problems which pose challenges to monetary management (Walsh, 2005; Amtenbrick, 2004; Lybek and Morris, 2004).

In Nigeria, some of these problems include inadequate data at the CBN, unreliable and lagged returns from banks, and the problem of attracting and retaining adequate and quality human capital, managing excess liquidity created outside the banking system, fiscal dominance and undue government interferences, all these inhibit the performance of the CBN (Ayorinde, 2012).

2.1.9 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 (Piana, 2001). Consequently, inflation signifies a general and persistent increase in the prices of goods and services in an economy (Ojo, 2000; Meberg, 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, 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 (CNB, 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 will use the headlines inflation used by CBN as against the consumer price index. 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, 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 postulated 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 (Adebiyi, 2009; McCallum and Nelson 2010; Habibullah et al. 2011).

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; Adesina and Summers, 1993; Posen, 1993; Pollard, 1993, Debelle and Fischer, 1995 as well as Investopedia, 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 factor has 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 (inflation tax) as a source of deficit financing (Agenor and Hoffmaister, 1997; 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 (Adesina 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, 2001; 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, 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 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, 2007). Moreover, inflationary episodes can be characterized as low, moderate, high, extreme and hyper. Low inflation refers to 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 100 per cent annual inflation rate. Last but not the least, any inflation below zero, is regarded as deflation (Vegh, 1992; 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 inflation;

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 rate generated a pass through to domestic prices, pushing the rate of inflation form 13.7%in 1986 to 61.2% in 1988and 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 (NBS, 2012; CBN, 2012; Sanusi, 2012).

2.1.10 Monetary Policy – Experiences and Regimes 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 (Mordi, 2006; Obadan, 2006). 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 (Gbadebo & Mohammed, 2003; Ojo, 2013; Oyakhilomen & Rekwot,

2014). 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; 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 (OMO). Cash reserve requirements (averaging system and Foreign exchange swap (Safdari et al. 2012; Borio, 2014; Salami et al. 2010).

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 reduce the demand for lending and, therefore, reduce the growth of broad money (reduce monetary inflation).

2.1.11The Concept of Economic Development

A country's economic development is usually indicated by an increase in citizens' quality of life. 'Quality of life' is often measured using the **Human Development Index**, which is an economic model that considers intrinsic personal factors not considered in economic growth, such as literacy rates, life expectancy and poverty rates.

While economic growth often leads to economic development, it's important to note that a country's GDP doesn't include intrinsic development factors, such as leisure time, environmental quality or freedom from oppression. Using the Human Development Index, factors like literacy rates and life expectancy generally imply a higher per capita income and therefore indicate economic development. (UNDP, 2016)

In his view, Aigbokhan (1995), maintains that, economic growth means an increase in the average rate of output produce per person usually measured on per annum basis. It is also the rate of change in national output or income in a given period. Economic growth is the increase of per capital gross domestic product (GDP) or other measure of aggregate income. It is often measured as the rate of change in real GDP. Economic growth refers only to quantity of goods and services produced. Goodwin (2007) defines economic growth as an increase in real gross domestic product (GDP), that is, gross domestic product adjusted for inflation. The growth can either be positive or negative. Negative growth can be referred to by saying that the economy is shrinking (Uwakaeme, 2015). This is characterised with economic recession and economic depression. Ullah and Rauf (2013) noted that whenever there is increase in real GDP of a country, it will

boosts up the overall output and we called it economic growth. The economic growth is helpful to increase the incomes of the society, help the nation to bring the unemployment at low level and also helpful in the delivery of public services.

Macroeconomic policy refers to those policy of Government aimed at the aggregate economy, usually to promote the macro goals of full employment, stability, and growth. Common macroeconomic policies are fiscal and monetary. Fiscal policy is the microeconomic policy where the government makes changes in government spending or tax to stimulate economic growth while monetary policy deals with changes in money supply or changes with the parameters that affects the supply of money in the economy. The objectives of this policy include the achievement of sustainable economic growth and development, stable price and full employment. Some of the objectives set is potentially in conflict with each other, which means that, in attempting to achieve one objective, another one is sacrificed. For example, in attempting to achieve full employment in the short-term price inflation may occur in the longer term.

Ullah and Rauf (2013) assert that a sound macroeconomic policy has to do largely with the consistent management of short-term policy instruments pursuing a sustainable and predictable pace for aggregate economic variables and major prices (wages, inflation, interest rates and exchange rates). They established further that monetary, fiscal and exchange rate policies, together with structural reform, have major consequences for the social wellbeing of societies, not only in terms of protection against shocks and crises but also in term of equity. Many, if not all, of the necessary social policies are of a domestic nature. Pursuing them, however, depends to a considerable extent on the international enabling environment in which the global financial system, the unsettled debt crisis and increasing official development assistance (ODA) flows play a significant role (Onyeiwu, 2012; Doguwa, 2013, Uwakaeme, 2015).

The Neo classical growth models of Solow (1956) and Swan (1956) believe that, in the long run, that technological progress and population growth are the main determinant of economic growth. They are of the view that government can influence the population growth rate, saving rate and incentive to invest in human and physical investment through its different policies such as fiscal, monetary, income and exchange rate policies. These policies can change the equilibrium factor ratio or affect the transition path of steady state growth rate. While endogenous growth model by Barro (1990), Lucas (1990) and Rebelo (1990), believe that physical and human capital do affect economic growth but fiscal policy variables like distortionary taxation and productive expenditure affect the output level and its steady growth rate. According to Neo classical growth model, impact of fiscal policy on steady economic growth is temporary and not the permanent one.

Over the last few decades the macroeconomic policies and economic growth relationship became the hot issue amongst the government, policy makers and researchers. There is a growing literature on the determinants of economic growth in cross countries and country specific with varied submission and conclusion. For example Barro (1995) examines the determinants of economic growth and the empirical finding for a panel of around 100 countries from 1960 to 1990 strongly support the general notion of conditional convergence. For a given starting level of real per capital GDP, the growth rate is enhanced by higher initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of the rule of law, lower inflation, and improvements in the terms of trade while growth is negatively related to the initial level of real per capital GDP. Political freedom has only a weak effect on growth but there is some indication of a nonlinear relation and concluded that there is a strong positive influence of the standard of living on a country's propensity to experience democracy.

Cozier and Selody (1992), in a study of 22 countries belonging to the Organisation for Economic Cooperation and Development (OECD), suggest that inflation has a negative effect on economic output which is economically large and statistically significant. They further conclude that a permanent 1 percentage point reduction in inflation would raise growth by just over 0.1 percentage points, and would eventually raise output by about 6 percent. Dewan and Hussein (2001) used a sample of 41 middle-income developing countries to develop an empirical and model for growth. The study also presents a wide-ranging examination of both theoretical and empirical evidence on the many ways macroeconomic policies affect growth. The results suggest that apart from growth in the labour force, investment in both physical and human capital, as low inflation and open trade policies are necessary for economic growth. Furthermore, the ability to adopt technological changes in order to increase efficiency is also important. Since many developing countries have a large agriculture sector, adverse supply shocks in this sector was found to have a negative impact on growth.

Antwi, Mills and Zhao (2013) study the impact of macroeconomic factors on economic growth in Ghana for the period 1980 to 2010 by means of Cointegration and error correction models using yearly data for the period and then recommend actions that should be taken to speed up the growth process in the country. The findings showed that long-run economic growth is largely explained by physical capital, foreign direct investment, foreign aid, inflation and government expenditure. It is also evident that economic growth is not affected by short-terms changes in labour force. The estimated coefficient of the ECM indicates a mild speed of adjustment to equilibrium. They recommended that government must reform the tax system and improve its budget balance and government should continue to direct foreign assistance into the programmes that produce public capital since this improves the productivity of the masses and hence, is likely

to have a positive long run effect on economic growth. Rauf (2013) evaluates the impacts of macroeconomic variables on economic growth and discovered that it is positively affected by foreign direct investment and saving rate while exports have negative impacts on economic growth and labour force and tax rate have, no impacts on economic growth.

Aurangzeb and UI Haq (2012) assert that investment plays an important role in driving growth through increase in productivity levels. Foreign direct investment brings technology and creates employment, it helps to adopt new methods of production and enhances productively by bringing competition in the economy. Foreign direct investments also introduce to improve management and organizational skills, and explore hidden market in the economy. It reduces the barriers in adoption of technology and brings improvement in the quality of labour and capital inputs in the host economy. Furthermore investigating the impact public investment, private investment and foreign direct investment contribute to economic growth significantly and he concluded that bi directional relationship of gross domestic production with foreign direct investment and public investment while unidirectional relationship of gross domestic production is found with private investment and recommended that Pakistan should make stronger efforts to attract as much FDI as possible to the foreign exchange sectors in the short term.

Rahman and Salahuddin (2010) empirically analyse the relationship between economic growth and its determinants, with special focus on stock market development. Using data for the period from 1971 to 2006 and employed FMOLS and ARDL bounds testing for the long run relationship and ECM for the short run dynamics, the findings suggest a positive relationship between efficient stock markets and economic growth, both in short run and long run while financial instability and inflation have negative effects. Furthermore human capital, foreign direct investment and stock market liquidity have positive impact on economic growth.

Sabir and Tahir (2012) study the impact of different macroeconomic variables on the welfare of the poor in Pakistan, through annual time series data which spanned between 1981and 2010. Using multiple regression technique to detect the relation between macroeconomic variables and poverty, the findings revealed that GDP growth rate per capita income, major crops, minor crops and livestock had negative impact while inflation and population growth rate had positive impact on poverty and concluded that the reduction in poverty in Pakistan is to be driven by the changes in the macroeconomic variables.

Zafar and Zahid (2013) examine the effects of some of the key macroeconomic variables on economic growth. Employing multiple regression framework and time series data over the period 1959-60 to 1996-97, the quantitative evidence shows that primary education to be an important precondition for accelerating growth. Similarly, increasing the stock of physical capital and openness of the economy contribute to growth. The empirical results also suggested that budget deficit and external debt is negatively related to economic growth, suggesting that relying on domestic resources is the best alternative to finance growth and reinforce the importance of sensible long-run growth-oriented policies to obtain sustainable growth.

For studies conducted in Nigeria, Kolawole (2013) asserts that macroeconomic stability is fundamental basis of sustainable economic growth, because, it increase national saving and private investment and also improves exports and balance of payments with improving competitiveness. A macroeconomic stability, therefore, to a large extent guarantees economic wellbeing of the people. To this end, there are several factors identified as potential determinant of macroeconomic stability such as low inflation, low deficit, stability of real exchange rate and exchange relationship. These aforesaid factors are serious drivers of economic growth. He empirically examined the growth-effects of macroeconomic stability factors in Nigeria. Using

time series data for the period 1980 to 2011 and adopting various econometric techniques such as Granger causality test, and Error Correction Mechanism (ECM), the results reveal that real interest rate has direct and significant effects on Nigeria economic growth while external debt and real exchange rate impact negatively on growth in the country. The study concluded that for macroeconomic stability to be achieved in Nigeria, each of the factors should be examined individually such that its respective effect on growth could be identified while appropriate macroeconomic policy would be formulated and implemented where required.

Machi (2011) empirically tests the determinants of economic growth in Nigeria using time series data ranging from 1970 to 2008 and adopting the Johansen's method of cointegration-regression analysis. The findings showed that policies that encourage investment in physical capital, human capital, man power development, training, research and technological development would boost both short run and long term growth of the economy. Hence policy tools such as fiscal, monetary and income-price policies should be used by the government to achieve economic growth in Nigeria.

Ahmed and Sabo (2011) evaluate the impact of macroeconomic policies on economic development in Nigeria for the period which spanned between 1990 and 2008. Employing multiple regression technique in the analysis, it was discovered that public capital expenditure, fuel price, balance of trade and bank total lending have positive impact on economic development while net foreign direct investment and dummy variable which capture the period of major macroeconomic policies has negative and insignificant effect on economic growth which implies that the structural adjustment programmes introduced in 1986 and covered up to 1994 as well as National Economy Empowerment and Development Strategies introduced since 2004 did not translate into the long run economic growth. Rather they ended in pushing the

economy deeper into the depression. They recommended that there is a need to introduce greater depth and comprehensiveness in the ongoing macroeconomic policy, and more efficient utilization of foreign direct investment to make macroeconomic policies impact significantly on economic development in Nigeria.

Edoumiekumo and Opukri (2013) evaluate economic growth factors in Nigeria considering the role of Global Trade by using annual time series data from 1981 to 2008. The result shows two-co-integrating equations which establish the existence of long run relationship among the international trade. Ordinary least square statistical technique was used to assess the degree of influence the variables, RGDP, export and import. The export parameter is insignificant at 5 percent. The overall model is significant at 5 percent. While the Granger causality test showed that there is causality between the variables and realized a unidirectional relationship. Real GDP Granger cause export and import Granger cause RGDP and export and concluded that Nigeria needs to increase or diversify her export good to enjoy more of the benefits of international trade which will have robust impact on her economic growth.

2.1.12 Monetary Policy and Economic Development

Monetary policy is one of key drivers of economic development through its impact on economic variables. Economic development is essential in an economy as it reduces poverty as well as improving livelihoods. The growing importance of monetary policy has made its effectiveness in influencing economic growth a priority to most governments (Ajisafe and Folorunso, 2002; Khabo, 2002; Dornbusch et al, 1998; Mankiw, 2002; Cittadino et al, 2007).

Despite the lack of consensus among economists on how monetary policy actually works and on the magnitude of its effect on the economy, there is a remarkable strong agreement that it has

some measure of effects on the economy (Nkoro, 2005) Monetary policy as a combination of measures designed to regulate the value, supply and cost of money in an economy, in consonance with the expected level of economic activity (Folawewo and Osinubi, 2006). For most economies, the objectives of monetary policy include price stability, maintenance of balance of payments equilibrium, promotion of employment and output growth, and sustainable development. The pursuit of price stability invariably implies the indirect pursuit of other objectives such as economic growth, which can only take place under conditions of price stability and allocative efficiency of the financial markets. Monetary policy aims at ensuring that money supply is at a level that is consistent with the growth target of real income, such that non-inflationary growth will be ensured. Monetary policy is used as inflation is generally considered as purely a monetary phenomenon. Monetary policy influences economic development through aggregate spending, changes in money supply and interest rates influence consumer spending as well as investment decisions. Consequently, aggregate demand changes in response to monetary policy adjustments.

2.1.13 **Economic Development Measurement indicators**

Human development is considered as one of the core areas of interest in development economics. There are several ways in which we can define human development. It is difficult to find a single coherent definition. However, the best way to explain it can be found in Sen's book 'development as freedom'. It says that human development can be regarded as expansion in people real freedoms that they enjoy. Focusing on human freedoms contrasts sharply with narrower views of development, such as identifying development with the growth of Gross National Product (GNP), with the rise in personal incomes, industrialization, with technological advance, or with social modernization. Sen (1999) said that, it is surely not a purpose to

debilitate the contribution of these variables in accentuating welfare. Rather, it is simply argued that these variables are not sufficient conditions for development. We need to consider other dimensions too such as reach to fresh water, social and economic rights, or access to clothing and shelter etc. Similarly, Wilson and Woods (1982) also realized the importance of multi-dimension indices and measured to analyze the increasingly complex modern society on economic and social front. Having discussed the complexity of defining development, it is even more challenging to measure human development. Several ways have been formulated and utilized to serve the purpose over the course history. Among the beginners, GDP per capita was a main variable as a proxy for human development. However, it was highly debated to use a measure of income as an alternative to human development. Consequently, we witnessed numerous other composite indices by various social scientists that were more credible and appropriate to measure development such as Child Development Index by 'Save the Children' NGO and Gender related Development Index (GDI) by UNDP. However, one of the most important indices among them is Human development index or HDI. It was proposed by Mahboob-ul-Haq in early 1990s on the basis of developmental concepts presented by Amartya Sen. It was from first UNDP's Human Development Report (HDR) that it started getting reported annually.

The construction of HDI has been explained fully in Human Development Report (1999). The value ranges from 0 to 1, where 0 implies no development and 1 mean full development. Normally, no country lies at the extremes and possesses a value between these two numbers. Though, the main structure is the same there has been some change in its construct since 2011, as elaborated in Human Development Report (2010). Contrary to simple income or single development measures like poverty Alleviation, unemployment, etc. HDI is a composite of three different components. Each of them is listed below with all the necessary detail.

i. Standard of Living:

The first component is the standard of living, and the proxy used to calculate it is the natural log of gross national income (GNI) per capita adjusted purchasing power in US dollars. GNI is different from GDP in that it is composed of the sum of all value added by resident producers in the economy plus product taxes plus receipts of primary income from abroad. Then, the GNI is normalized for each of the country by the formula:

Income Index(II)=ln GNI −ln(min) / ln Max −ln(min)

Where ln (max) and ln (max) are natural logarithm for maximum and minimum GNI reported for that particular year.

ii. Education:

The education level of each country can be calculated through the education index. Two variables; mean years of schooling and expected year of schooling are given one-half weight each. Adult literacy rate has been replaced by mean years of schooling and expected year of schooling has replaced combined enrolment ratio for primary, secondary and tertiary institutions. The formula for education index is

$$EducationIndexEI=(MYS-MYSMIN\ /MYSmax-MYSMIN \times(EYS-EYSMIN\ /\ EYSMAX-EYSMIN))12$$

Where, MYS is mean years of schooling and EYS is expected years of schooling.

iii. Health and Longevity:

Longevity is measured by life expectancy at birth and normalized by the formula

$Longevity\ (LI) = L - LMIN\ /\ LMAX - LMIN$

Where L is life expectancy at birth for a country and min and max are minimum and maximum values for that particular year.

Finally, the HDI can be calculated by taking the geometric mean for all three measures as: = $EI \times II \times LI3$

For example for year 2011, Norway tops the list with the HDI of 0.943, and the Republic of Congo is ranked at the bottom of the list composed of 183 countries with the HDI of 0.283 (Human Development Report 2011, p.138).

Al-Hilani (2012) noted that HDI has provided us with the multiple-dimensional framework to measure development compared to one dimensional income approach of poverty alleviation, unemployment etc. There may present certain issues with the construct and form of HDI, but it does not debilitate its importance as one of the simple indices that provide us insight with some of the basic human freedoms. Moreover, lots of improvements have been made in the mathematical construct of HDI along time, and HDI has proved to be a much reliable index now compared to other indices.

Since its construct, there has been found immense amount of economic literature relating to the motive, construct and reliability of HDI index. We found cases both for and against HDI index. Though, there may exist immense critic relating to the construct and form of the HDI; it is almost firmly accepted that it does provide with ‘something more’ than simple income approach such as GDP or GDP per capita.

Sagar and Najam (1999) evaluated the performance of HDI since its introduction in 1990s. They declare HDI to be a fruitful index, as it is a good step forward from unilateral income based approach. Booysen (2002) also discussed in detail why the multi-dimensional indices such as HDI are still considered a progress in explaining the development despite having issues with their constructs and statistical shortcomings. It is argued that though we can point out problems; these indices are useful in that they simplify complex measurement constructs and appeal for an attention for the variables included.

On the other hand, huge literature stressing to alter the existing construct for better results. For example, Hicks (1997) questioned the lack of distribution effects in HDI. HDI does expose country's performance in educational and health aspect, in addition to income, but it fails to incorporate how these dimensions are distributed among the people. The unique formulation in his Inequality-adjusted Human Development Index (IAHDI) is that it accommodates for education and health based inequality, in addition to income inequality; that is talk about too often. The results show that while accounting for inequality measures, some countries, such as Latin American countries, perform very badly on IAHDI scale but depict quite appreciating picture otherwise. On the other hand, though looking quite interesting on theoretical grounds the accurate collection of inequality data on educational and life expectancy dimensions remain quite challenging. Anyway, UNDP is now also reporting inequality based human development index, in addition to normal index, and we can interpret the human development from the lens of another perspective. Noorbaksh (1998) also suggested some alterations to the structure of HDI index. He criticized the scale effect in income and educational component of the index. It is argued that an additional dollar or an additional year of schooling is not as contributively at a high level of incomes or education level for people, as it is at a lower level of these variables. So,

introducing diminishing marginal returns to both educational and income dimensions of HDI improve the reliability of the index and correct the extra optimistic pictures at a high level of component values. It is argued that this 'Modified Human Development Index (MHDI)' is a better indicator for not only to estimate any country's performance over time more accurately, but also when comparing any country in the context of rest of the world.

Sometimes, HDI provide us with an alternative way to look at the various aspects of the country's performance. Nissan and Niroomand (2005) compared the convergence and divergence phenomenon between income and other basic need variables such as HDI. The study divided the sample of 100 countries among the three groups high, medium and low on the basis of their income levels and HDI. The phenomenon of convergence was established for HDI especially in the case of poor countries whereas the income measure showed a divergent part. We observed an improvement in quality of life in low income countries over time. However, it was inferred that richer countries are still performing better despite the improvement in poor countries in the domains of quality of life. So, governments in developing countries are needed to allocate their funds more appropriately for better results in future. Views relating to HDI lie in other extreme too. Certain studies completely dismiss the index on the basis that it fails to provide anything comprehensible and informative. Lind (2004) evaluated the reliability of the HDI index by analyzing the various feature of HDI. It is expressed that HDI is not a very suitable index for policy recommendations. It is determined that HDI sensitivity for each of its component variable is very different, and an equal increase in any one dimensions of it may bring in different changes in HDI. Further, it is argued that the HDI values for most of the developed countries are very high and close, and it is almost redundant to compare any two on

the basis of HDI. Moreover, any developed country may show better results on HDI, despite being inferior on the ground, due to immense room for measurement or mathematical errors.

HDI may also introduce academia to extremely novel insights if used with some alternations. Another unique study is done by Harttgen and Klasen (2012) who took an initiative to analyze the micro-level distribution of HDI. HDI is a macroeconomic indicator by default and even adjusting it to inequality measures, as mention above, fails to incorporate micro level phenomenon. However, it is more knowledge and useful for policy purposes to investigate disparity in HDI among different economic and social groups including households. By calculating household level components of HDI, it was established that in some countries with low income equalities, we have witnessed high level of HDI inequality among different social groups. Similarly, the reverse result was also observed. The technique made it feasible to focus on intra-country level results and allowed a room for policy recommendations for various sections of the country.

2.1.14 Monetary Policy and Interest Rate

Interest and inflation are keys to investment decisions, since they have direct impact on the investment yield. When price rises, 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 (Investopedia, 2012; Fernando, Robert and Warren, 2008; Clarida, Gali and Gertler, 1999; Alvarez et al. 2008).

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. (Chimobi and Uche, 2010).

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, while 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 instrument they offer. To compensate for this loss, they increased 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 (Investopedia, 2012, Nwosa and Oseni, 2012, Chuku, 2009; Michael, 2015).

2.2. Theoretical Framework

This theoretical framework outlined some of the relevant theories of economics and finance which supports our study and includes;

2.2.1 The Classical Monetary Theory

The classical school evolved through concerted efforts and contribution of Economists like Jean Baptist Say, Adam Smith, Henry Thornton, John Stuart Mill David Ricardo, Pigou and others who shared the same beliefs. These formed the major proponents of the classical Monetary Theory and spanned from 1802 to 1926. The tenants of the classical model attempts to explain the determination, savings and investment with respect to money, the classical model on Say's law of markets which states that "supply creates its own demand". Thus classical economists believe that the economy automatically tends towards full employment level by laying emphasis on price level and on how best to eliminate inflation .The classical economists decided upon the quantity theory of money as the determinant of the general price level. Theory shows how money affects the economy. It may be considered in terms of the equation of Exchange. MV= PY Two very similar quantity theory formulations were used to explain the level of price viz; the transactions formulation or the Cambridge equation (Friedman, 1987; Friedman and Schwartz, 1982; Cagan, 1987; Laidler, 1991; Judd and Scadding, 1982; Kaldor, 1982).In the transaction version – associated with Fisher and Newcomb, some assumptions were made: that the quantity of money (m) is determined independently of other variable, velocity of circulation (V) is taken as constant, the volume of transactions (T) is also considered constant. Thus of price (p) and the assumption of full employment of the economy, the equation of exchange is given as; MV = PT, which can readily establish the production that – the level of price is a function of the supply of money. That is, p= F (m) which implies that, any change in price changes money supply. In cash balances version – associated with Walras, Marshall, Wicksell and Pigou (Udude, 2014). The neoclassical school (Cambridge school), changed the focus of the quantity theory without

changing its underlying assumptions. This version focuses on the fraction (K) of income, held as money balances. The Cambridge version can be expressed as:

M= kpy Where K= Fraction of income, M =Quantity of money, P= price level, Y=value of goods and services The K in the Cambridge equation is merely inversion of V, the income Velocity of money balances, in the original formulation of quantity theory. This version directs attention to the determinants of demand for money, rather than the effects of changes in the supply of money (Anyanwu, 1993; Chimezie, 2012). The relevance of this theory to our study is that the monetary authorities can manipulate the quantity of money or price level to stimulate economic development while the major challenge is curtailing inflationary trends resulting from money supply changes.

2.2.2 Keynesian Liquidity Theory

Propounded by John Maynard Keynes in 1925 and reigned till 1950 and 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 (Tily, 2010; Chick, 1983; Chick, 2001; Dow; 1997, Kahn, 1984; Basile et al. 2011; Howson 1993). The tenants of this school of thought believe that: Prices were determined mainly by labour costs; Price levels and quantity of goods physically available determined the quantity of money for active circulation; Any money which was not directly involved in transactions constituted idle balances (liquid assets) which operated on the

rate of interest; the quantity of idle balances determined mainly the volume of savings, investment, employment and income. Keynes thus replaced the classical school's quantity theory of money equation (MV = PQ) with Y=C + I (which is the income multiplier approach). The relevance of this theory to our study is appreciated in the dynamics of open market operations of the monetary authorities.

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 would 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; trasactionary, precautionary and speculative motives (Howson and Donald, 1997; Tilly, 2009; Turner, 2011; Smithin, 1996).

Transactionary motive; this relates to the needs to hold cash balances to meet current transactions of personal 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 $M = L_1(Y)$.

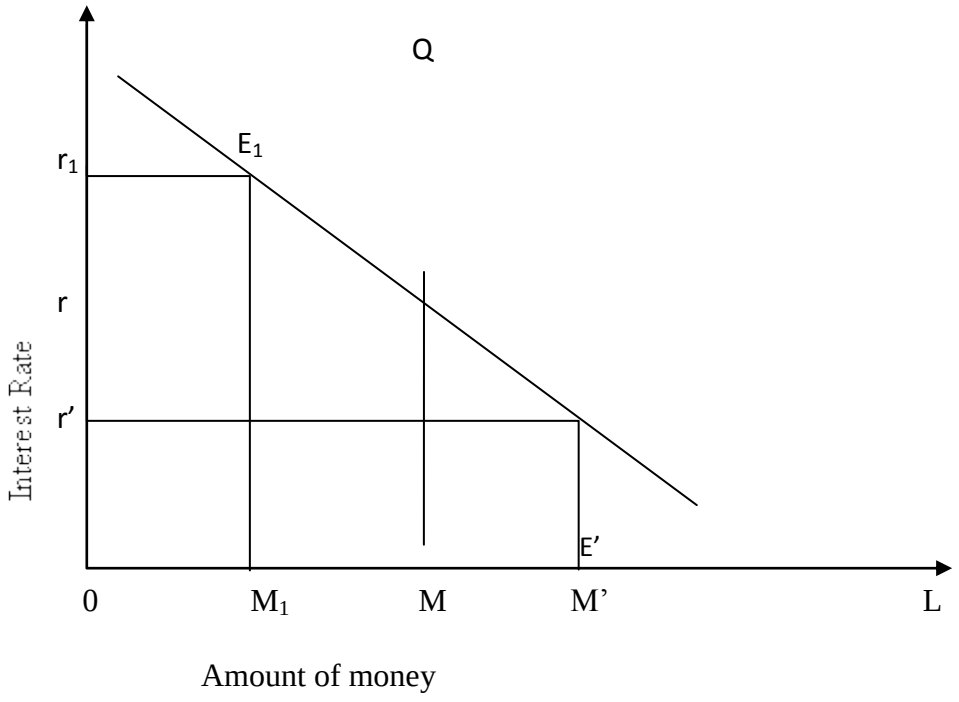
Speculative motive; money is held for securing profit from knowing better than the market what the future will bring forth. Individuals and businessmen have funds, after keeping enough for transactionary and precautionary purposes, like to gain by investing in bonds. Money held for speculative purposes 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 to 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 (Giangiacomo, 1996). If there is any deviation from this equilibrium, an adjustment will take place via the rate of interest, and the equilibrium 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).

Figure 2.4: Determination of the rate of interest



Source: Jhingan (2002)

However, the theory has been vigorously criticized by Hansen, Robertson *et al,* as a college bursar's theory, at best an inadequate and at worst a misleading account and pre classical, mercantilist, and a man in the street economics. This is because of its deficiencies such as a wrong notion of liquidity trap, assumption that only money held for speculative purposes is fruitful while money held as 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 closes one can use to relate monetary policy and interest rate (Jhingan, 2002).

2.2.3 The Monetarist Theory

The foremost proponent of the monetarist theory from 1950 to 1970 was Milton Friedman following the inability of the Keynesian theory to rescue the depressed American economy from economic and financial crisis. 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 (Friedman, 1970; Thomas, 2006; Handa, 2009). The QTM is traceable to Irving Fisher's famous equation of exchange;

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

Where M stands for the stock of money; V the velocity of circulation; 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

$$MV = PY \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (1)$$

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 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 (ECB, 2013; Doherty, 1995; Ip Greg and Whitehouse, 2006; Cunningham and Ronald, 1990). 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 (Philips, 1987).

Nevertheless, the model's general weakness is found in its inadequacy to explain general price movement. The truisms 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, 2007; Jinghan, 2002). Despite these deficiencies, the theory could still be used to analyse inflation in relation to monetary policy (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 (Sims, 1980; Reder, 1982; Gordon, 1982). We find this theory most appropriate for our study as effective use of monetary policy instruments in solving economic crisis of money supply and price levels.

2.2.4 Economic Development Theories

2.2.4.1 New Growth Theory

Endogenous growth or the new growth theory emerged in the 1990s to explain the poor performance of many less developed countries, which have implemented policies as prescribed in neoclassical theories. Unlike the Solow model that considers technological change as an exogenous factor, the new growth model notes that technological change has not been equal nor has it been exogenously transmitted in most developing countries (World Bank 2000). New growth theorists (Romer 1986; Lucas 1988; Aghion and Howitt 1992) linked the technological change to the production of knowledge. The new growth theory emphasizes that economic growth results from increasing returns to the use of knowledge rather than labour and capital. The theory argues that the higher rate of returns as expected in the Solow model is greatly eroded by lower levels of complementary investments in human capital (education), infrastructure, or research and development (R&D). Meanwhile, knowledge is different from other economic

goods because of its possibility to grow boundlessly. Knowledge or innovation can be reused at zero additional cost. Investments in knowledge creation therefore can bring about sustained growth. Moreover, the knowledge could create the spillover benefits to other firms once they obtained the knowledge. However, markets failed to produce enough knowledge because individuals cannot capture all of the gains associated with creating new knowledge by their own investments. Policy intervention is thus considered necessary to influence growth in the long term. The new growth models therefore promote the role of government and public policies in complementary investments in human capital formation and the encouragement of foreign private investments in knowledge-intensive industries such as computer software and telecommunications (Meier 2000). Although the new growth theory helps to explain the divergence in growth rates across economies, it was criticized for overlooking the importance of social and institutional structures (Skott and Auerbach 1995). Its limited applicability lies in its assumptions. For example, it treats the economy as a single firm that does not permit the crucial growth-generating reallocation of labour and capital within the economy during the process of structural change. Moreover, there are many other factors which provide the incentives for economic growth that developing countries lack such as poor infrastructure, inadequate institutional structures and imperfect capital and goods markets (Cornwall and Cornwall 1994). Policy-makers will therefore need to pay careful attention to all of the factors that determine the changes and their impacts on the aggregate growth rate.

2.2.4.2 Theory of Coordination Failure

The foundation of the theory of coordination failure is the idea that the market may fail to achieve coordination among complementary activities. When complementariness exist, that is when returns of one investment depend on the presence or extent of other investments, there

exist two scenarios. On the one hand, optimally, all investors as a whole are better off with all investments to be achieved at the same time. On the other hand, it would not make sense for an investor to take similar actions when he believes that others may not do the same as well. The market is said to have failed to coordinate investors' actions in this way. Coordination failure therefore leads the market to an (equilibrium) outcome inferior to a potential situation in which resources would be optimally allocated and all agents would be better off. As a result, underdevelopment equilibrium is possible (Hoff and Stiglitz 2000).The theory of coordination failure became influential in the 1990s. However, it has a history of more than half a century. Coordination issues among complementary industries were first raised by Rosenstein-Rodan (1943). Like Rosenstein-Rodan (1943), early coordination failures economists Nurkse (1953) and Hirschman(1957) emphasized the role of the government to solve the problem. In order to reach an optimal level of coordination, the policy they recommended was a "bigpush"—a public-led massive investment program—which can cause complementarities to take place in the rest of the economy.

Like other early development models, "big push" strategies ran out of favour when the world witnessed the collapse of centrally planned economies and the slow growth, stagnation or worst results of state-led industrialization in the underdeveloped countries (Meier 2000). However, development economists have recently returned to emphasize the problem of complementarities between several conditions necessary for successful development to take place (Glăvan 2008). Hoff (2000), and Bowles Durlauf and Hoff (2006) described the economy as an ecosystem where the behaviour of one can affect the others'. The coordination failure among many different individuals lead the economy to multiple equilibrium, but not all of them are good for every member of the economy, and some in fact are very undesirable. As a result, the market fails to

coordinate everyone to achieve the optimal equilibrium. In other words, "A firm's productivity depends not only on its own efforts, and abilities, and on general economic conditions (for example, the macroeconomic environment and the legal system), but also on the actions of other firms, infrastructure, regulation and other public goods" (Rodriguez-Clare, 2005). In a similar vein, Rodrik (2004) also indicated that success or failure of an action could depend on its milieu.

In a market mechanism, there are uncertainties that a good equilibrium can be obtained. A bad equilibrium can exist when firms have pessimistic expectations and thus show their reluctance to invest, and consequently fail to coordinate their businesses. "And whereas in the past we thought the implication was that the economy would be slightly distorted, we now understand that the interaction of these slightly distorted behaviours may produce very large distortions. The consequence is that there may be multiple equilibria and that each may be inefficient" (Hoff and Stiglitz, 2000). The existence of coordination failure cannot therefore be disputed and has become important. When the market mechanism does not work, the active roles of the government need to be highlighted. According to coordination failure economists, in the multiple equilibria circumstances described above, the government can coordinate firms to move them into the domain of good equilibrium. The theory of coordination failures offers some important overall lessons for policy-makers. The theory often highlights the problems of market failure that require selective government intervention to ensure that several things work well together at the same time. However, to get sustainable development underway is obviously not an easy task. The "big push" strategy is recommended recently by United Nations Development Programme (2005). The programme suggests that for developing countries to break out of the poverty trap, a big push of basic investments between now and 2015 in public administration, human capital and key infrastructure is necessary (United Nations Development Programme 2005).However, the

theory of coordination failure has been criticized for its overemphasis on the roles of government. Critics have asserted that the government is ineffective and could choose a bad policy (Killick, 1976; Hoff and Stiglitz 2000). Ifa bad policy is implemented, it can push an economy into a bad equilibrium for years to come and even into a worse equilibrium than the one with which the country began (Hoff and Stiglitz, 2000). Moreover, the policies recommended by coordination failure models lacked details of how the government can coordinate the economy. Policy-makers therefore need to be more cautious of these strategies to address coordination failure issues.

2.2.5 Anchor Theory of Study

The basic theory on which this study is anchored is the **Monetarist theory,** which holds 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 (Friedman, 1970; Thomas, 2006; Handa, 2009). When price level increases, access to credit is reduced and propensity to consume by firms and households is diminished and the economy is not stimulated for development but in the event of drop in price levels, financial institutions and households now possess greater access to money credit because of reduced interest rates and thus there is greater propensity to consume and invest leading to economic development.

The reasons for this study adoption of the monetarist view include;

i. The failure of the Keynesian wonders

ii. The adoption of the central believe that money really matter as occasioned in our study topic of monetary policy management.

iii. Monetary theory flourishes better during periods of monetary crisis during which empirical investigations are most favoured.

2.3. Empirical Review

Quite a number of researches have been conducted world over on monetary policy and macroeconomics 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 of 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 (M_2), Minimum Rediscount Rate (MRR) and Real Effective Exchange Rate (REER). His study discovered that monetary policy innovations carried out on the price-based nominal anchors (MRR and REER) had neutral and fleeting effects on output. While the quantity-based nominal anchor (M_2) had modest effects on output and prices with a very fast speed of adjustment implying that the quantity of money (M_2) in the economy is the most influential instrument for monetary policy implementation in Nigeria.

Cheng (2007) examined the impact of monetary shock on output, prices, and the nominal effective exchange rate of 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 (1999) 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 as way that the objective it set to achieve is well defined, in a way that effort at stabilizing exchanging rate will not generate inflation and vice versa.

Additionally, several studies (Idowu, 2010; Uchendu, 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.

Suleman, Wasti, Lal and Hussaini (2009) in their study of money supply, output and prices in Pakistan found out that M_2 positively impact on prices in the economy.

Olubusoye and Oyaromade (2008) analysed the sources of fluctuations in inflation rate in Nigeria using the framework error correction mechanism and found out that the lagged consumer price index (CPI) among other variables propagate the dynamics of inflationary process in Nigeria. The level of output was found to be insignificant but the lagged values of money supply was found to be negative and significant only at 10% level in the parsimonious error correction model.

Omoke and Ugwuanyi (2010), Okpara, (1998) in their longrun study of money, price and output in Nigeria found out no cointegrating vector but however found out that money supply granger causes both output and inflation, suggesting that monetary stability can contribute towards price stability. They also concluded that inflation in Nigeria is a monetary phenomenon.

Okpara and Nwoha (2010) employed a two stage least square method and a reduced form of the growth model was singled out for long run cointegration and casualty test. Their result revealed

that money supply is a positive and significant function of prices and also granger causes prices with no reverse or feedback effect.

Ditimi (2009) adopted a simplified ordinary least squared technique and conducted the unit root and co- integration test in his analysis on monetary policy and macroeconomic stabilization in Nigeria and found out that interest rate has an insignificant influence on price stability.

Adofu, Abula and Audu (2010) analysed the impact of interest rate deregulation on the Nigerian economy using a time series data spanning 1986-2005 and observed that interest rate plays a significant role in enhancing economic activities. The empirical analysis showed that interest rate deregulation has a significant and positive impact on Agricultural productivity in Nigeria.

Eregha (2010) examines variations in interest rate and price stability in Nigeria, using a time series data 1970-2002, employed instrumental variable technique and found out that variation in interest rate played a negative and highly significant role on price decisions in the economy.

Daferighe, and Aje, (2009) using a time series data 1997-2006 employed the OLS method of regression and analysed the impact of the real Gross Domestic Product on stock market prices and found out that increased RGDP has a positive impact on stock market prices.

Sanchita and Rina (2011) Sanusi (2002) concluded in their analytical work on monetary policy using the co- integration test that to achieve macroeconomic stability, inflation, asset price etc, that the classical transmission mechanism of the monetary policy is useful in influencing the price and quantity of the above mentioned macroeconomic indicators.

Serkan (2008), Adam and Tweneboah (2000), used co- integration test, vector Error- Correction Model (VECM) to investigate the role of macroeconomic factors in order to explain the growth rate of interest rate, exchange rate and world equity index and found out that inflation rate is significant for only three of the twelve portfolios examined. They further exerted that there is

cointegration between macroeconomic variable and the prices of stock in Ghana indicating long run relationship.

Lozano (2008) analysed the evidence of the causal long- term relationship between money growth and inflation in Colombia considering the standard (m_1) the narrowest (m_0-base) and the broadest (m_3) definitions of money supply using a vector error correction (VEC) model with quarterly data over the last 25 years, and found out a close and significant relationship between inflation and money growth.

Ozoh (1998) investigated the long- run relationship between inflation and monetary growth in Turkey considering two alternative frivariate systems corresponding to the narrowest and the broadest monetary aggregate and found out joint endogeneity of money and inflation, rejects the validity of the monetarist view.

Mohammed and Ahmed (1995) employed stochastic simulations of a small structural rational expectations model to investigate the consequences of the zero bound on nominal interest rates and found out that if the economy is subject to stochastic shocks similar in magnitude to those experienced in the US over the 1980s and 1990s, the consequences of the zero bound are negligible for target rates as low as 2 percent. They also showed that the asymmetry of the policy ineffectiveness induced by the zero bound generates a non- vertical long- run Philip curve.

Asogu (1991) subjected inflation to econometric investigation from 1960 to 1989 using a single equation approach which proceeded in two steps, he expressed inflation rate as a function if money and its lagged values. The second specification of level utilized changes in money supply as a function of changing domestic credit, real output, net export or foreign assets and net government expenditure. His result indicates that increase government expenditure, especially

deficits, tend to increase the money supply and worsen depreciation of the exchange rate which in turn intensifies the inflationary pressure.

Atta Mensah and Bawumia (2003) using a vector- error correction forecasting, VECF model concludes that inflation was a monetary phenomenon in Ghana. The paper however does not explore the potential for real factors in price determination.

Fakiyesi (1996) estimated and tested the hypothesis that the main factor responsible for instability of prices and inflationary tendencies in Nigeria has been government expenditure. Using annual time series data, spanning 1960-1977, they tested hypothesis that the rate of inflation in Nigeria is linearly related to the rate of growth of money stock, government expenditure especially deficit. The result established some significant positive relationship between inflation rate and growth in bank credit, growth of money supply and growth in government expenditure.

Gambetti (2008) examines the contribution of policy shocks to the dynamics of inflation using a medium scale structural model estimated with US post- WWII data and Bayesain techniques over rolling samples and captures a fall in inflation volatility and attributes a portion of the changes to monetary policy shocks.

Bernanke et al 1999; Nadal De Simone, 2001: Corbo, Landerretche, 2002; Mishkin, (2007) demonstrated empirically using structural Vector Error Correction Model (SVEC) that inflation targeting is associated with an improvement in overall economic performance. According to these authors the rationale behind this success is that by targeting price directly, inflation target plays a role of explicit and strong nominal anchor.

Johnson (2002) provides strong evidence on immediate fall in inflation targeting (IT). Likewise, Guarkaynak, Levin, and Swanson (2007); Levin, (2004); argue eloquently that inflation

expectations are more anchored for targeters than non targeters, particularly at longer horizons. Consequently supporters of this views claim strongly that monetary policy has become more efficient under inflation- targeting.

On the other hand, Ball and Sheridan (2003), Roger and Stone (2005), state that the earlier victory proclaimed by the proponents of IT is still to be tested. Their analysis shows that industrialized non- targeters, like targeters, have experienced low inflation and high output growth during the same period.

Similarly, for the same period their volatility of inflation and output growth declined. Hence, one cannot attribute a recent disinflation and increase in output growth solely to the success of the IT policy. As Ball and Sheridan (2003) clearly put it, the economic environment has been fairly tranquil during the inflation- targeting era, and central banks have not been tested severely.

Likewise, Rogoff (2007) assigns these benefits to the forces of globalization. To support the effectiveness and success of IT, it could be tested during hostile periods of high inflation, such as the current rise in global food and oil prices.

Orphanides, Athanasids and Wieland (1999) while using numerical dynamic programming methods, compute optimal policies in a simple, calibrated open economy model and evaluate the effect of the liquidity trap generated by the zero bound. They found that the optimal policy near price stability is asymmetric, that is as inflation declines, policy turns expansionary sooner and more aggressively than would be optimal in the absence of the zero bound.

Paul et al (19970 use annual data spinning the period 1960 – 1989 on 48 developing countries and 22 developed ones to examine the inflation-growth nexus. The found mixed evidences as the relationship were negative in some countries and positive in others.

Barro (1995) adopts data for 100 countries 1960 – 1990 to investigate the effects of inflation on economic performance by using instrumental estimation method. He found that a 10 percent point increase in average inflation per year yielded a reduction in growth rate of real per capita GDP of between 0.2 and 0.3 percentage point.

Faria and Carneiro (2001) examine the inflation-growth nexus from the perspective of an economy suffering from high and persistent inflation. He studied the case of Brazil and found empirical evidence for a negative effect of inflation on output in the short-run.

Smyth (1995) estimates that 10% increase in the rate of inflation reduces the rate of growth of total factor productivity by 0.0255 which shows that inflation is inversely related to economic growth.

Umaru and Zubairu (2012) examine the impact of inflation on economic growth and development in Nigeria between 1970-2010 and found that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity.

Bruno and Easterly (1998) investigate possible relationship between inflation and economic growth using cross country data. They found that inflation has a negative effect on medium to long term economic growth and showed that the relationship is influenced by countries with extreme values (either very high or very low inflation).

Ayodele (2004) in his studies founds that those countries that participated more in globalization through large increases in actual trade volumes since 1980 had increased growth rate.

Lederman and Maloney (2003) examine the empirical relationship between trade structure and economic growth particularly the influence of natural resources abundance, export concentration and intra industry trade, and found that regardless of estimation technique, trade structure variables were important determinants of economic growth.

Hnatkovaska and Loayza (2004) in their study, investigate the relationship between macroeconomic volatility and long run economic growth and found that they were negatively related. The negative link was exacerbated in countries that are poor, undergoing intermediate stages of financial development, institutionally underdeveloped, or unable to conduct countercyclical fiscal policy.

Folonrunsho (2002) analyses the relative effectiveness of monetary and fiscal policy on economic activity in Nigeria through cointegration and error correction modelling techniques. Using time series data for the period 1970-1988 conducted a unit root test and found out that monetary rather than fiscal policy exerts a great impact on economic activity in Nigeria. The emphasis on fiscal action of the government has led to greater distortion in the economy.

Taylor (1993 and 1995) in their study on interest rate effect of monetary transmission mechanism observed that contractionary monetary policy leads to a rise in domestic real interest rates, raises cost of capital, thereby causing a fall in investment spending and a decline in output.

Anosike (2009) analyses a multiple regression data on the effectiveness of monetary policy on a structurally adjusting Nigerian economy between 1975 and 2003, and concluded that monetary policy has a significant influence on inflation and will be the benchmark to control inflation to a single digit in Nigeria.

Fakiyesi and Adeyeye (1996) estimate and tested the hypothesis that the main factor responsible for instability of prices and inflationary tendencies in Nigeria has been government expenditure.

Using a time series data, spanning 1960-1977, they tested the hypothesis that the rate of inflation in Nigeria is linearly related to the rate of growth of money stock, government expenditure especially deficit. The result established some significant positive relationship between inflation rate and growth in bank credit, growth of money supply and growth in government expenditure.

Roux (2004) using the co- integration test of Engle and Granger, established that there exist a significant relationship between inflation rate and money supply, GDP growth rate and money supply, money supply and interest rate, GDP and interest rate.

Bogunjoko (1997) investigates the efficacy of monetary policy as a stabilization tool, using modified St. Louis model to take account of the peculiarity of the Nigerian economy. Using an error correction model and data covering the period 1970 to 1993; the study found that money matters in Nigerian economy and the appropriate monetary target is the domestic credit of the banking sector.

Saibu and Nwosa (2011) examine the effect of monetary policy on sectoral output growth in Nigeria over the period 1986 to 2008. The study utilized an Auto Regressive Distributed Lag (ARDL) model and the findings showed that manufacturing sector is not sensitive to any of the monetary policy variables. In sharp contrast with manufacturing sector, agricultural sector is responsive to exchange rate. Their study concluded that monetary policy will be more effective if the inherent differences in these sectors are factored in the design of policies in Nigeria.

Chimobi and Uche (2010) examine the relationship between money, inflation and output in Nigeria. The study adopted co-integration and granger-causality test analysis. The co-integration result showed that the variables granger cause each other. Money supply was seen to granger-cause both output and inflation. The study suggested that monetary stability can contribute towards price stability in the Nigerian economy.

Chuku (2009) carries out a controlled experiment using a structural vector auto regression (SVAR) model to trace the effects of monetary policy shocks on output and prices in Nigeria. He conducted the experiment using three alternative policy instruments; broad money (M2), Minimum Rediscount Rate (MRR) and the Real Effective Exchange Rate (REER). He noted that M2 is the most influential instrument for monetary policy implementation.

Frederic (2007) concludes in his work on the reaction of price on the quantity of money supply in a time series data of thirty- five years that money supply exerts a positive and significant influence on the general price level in Nigeria. This lends credence to the Monetarist contention that inflation is everywhere and anywhere a monetary phenomenon.

2.4 SUMMARY OF EMPIRICAL REVIEW

Some of the consulted literatures in this study are summarised in the tabular form below;

Table 2. 4 – SUMMARY OF SOME SELECTED EMPERICAL WORKS

S/N	Author/Year	Title of Study	Theoretical Framework	Methodology	Findings
1	Asogu (1991)	Subjecting Inflation ToEconometric Investigation.	Keynesian Theory	Single Equation Approach	The results showed that changes in real income were significant and inversely related with the rate of inflation and statistically significant with govt. expenditure but not significant with domestic credit.
2.	Salisu (1993)	Role of interest rate in the Determination of demand real cash balances	Quantity Theory of Money	OLS	The research discovered that interest rate changes did not affect the demand level of cash balance. Hence, interest rate did not show significant relationship with money supply.
3.	Taylor (1993, 1995)	Interest rate effect of monetary transmission mechanism	Classical Theory	OLS	Discovered that monetary policy instruments such as M2 impacts real GDP. Hence, there is a significant relationship between monetary policy instruments such interest rate, exchange rate and money supply and real GDP.
4.	Mohammed and Ahmed (1995)	Stochastic simulation of structural expectation model	Classical Theory	OLS and Cointegration	Found that money transmission mechanism represented by interest rate and exchange rate do not exhibit significant effect on economic growth (GDP).
5	Barro (1995)	Effect of Inflation on Economic Performance	Keynesian Theory	Instrumental Estimation method	The research revealed a statistically significant impact of inflation rate on economic performance measured by GDP. The relationship is inversely proportional.
6.	Smith (1995)	Comparison of Inflation and Economic	Quantity Theory of Money	OLS	This research discovered that inflation has a significant and inverse effect on economic

		Development			development measured by GDP.
7.	Fakiyesi (1996)	Estimation and Testing of Price instability in Nigeria	Classical Theory	OLS	The work found that price level measured by inflation had a negative and significant relationship with money supply measured by M1 and M2.
8	Fakiyesi and Adeyeye (1996)	Price instability and inflationary tendencies in Nigeria	Classical Theory	OLS	Found that government expenditure is linearlyrelated to the rate of growth of money stock and has significantpositive relationship with inflation rate, growth in bank credit and growth of money supply.
9	Bongunjoko (1997)	Efficiency of monetary policy as a Stabilization tool	Keynesian Theory	Error Correction model (Modified st. Louis model)	Found significant effect of money supply on Nigeria economy (GDP) and the appropriate monetary target is the domestic credit of the banking sector.
10.	Paul et al (1997)	Inflation Growth Nexus	Classical Theory	OLS	Outcome revealed that the inflation rate effect on broad money supply while negative for some countries studied, it was positively significant for others.
11.	Bruno and Easterly (1998)	Relationship between Inflation and Economic Growth	Classical Theory	Panel Data Analysis	The panel data analysis result for the selected countries studied, showed a significant and inverse relationship between inflation and economic growth.
12.	Ozoh (1998)	Long-run Relationship between Inflation and monetary Growth	Monetarist Theory	Cointegration	The result showed a significant effect between Inflation and Monetary Growth measured by M1 and M2 respectively in the long-run period.
13	Opara (1998)	Long-run study of money, Price and Output in Nigeria	Monetarist	Cointegration, Granger Causality	Outcome of this work documented a significant relationship between money supply, output and inflation; Money supply Granger-caused both output and inflation.
14	Bernanke et al (1999)	Empirical Demonstration of Inflation as associated with economic Performance	Classical Theory	VEC Model	This study group from the US reserves discovered that a significant relationship exists between inflation and economic growth in the United States.
15	Omofa (1999)	Effect of Money	Quantity	OLS	Money supply measured by M2,

		supply on Price level	Theory of Money		had positive but statistically insignificant relationship with price level measured by inflation rate.
16	Nadal De Simeone (2001)	Empirical Demonstration of Inflation as associated with economic Performance	Classical Theory	VEC Model	Findings exhibited a significant relationship between inflation rate, money supply and economic performance measured by GDP.
17	Faria and Carneiro (2001)	Inflation Growth Nexus	Classical Theory	OLS, Cointegration	Discovered a negative and significant relationship between inflation rate and economic growth (GDP) in both short-run and long-run periods.
18	Sanusi (2002)	Analytical Work on Monetary Policy	Keynesian Theory	Cointegration Test	The research observed a significant long-run relationship between monetary policy instruments such as M2 and MPR and economic growth (GDP).
19	Corbo Landerretche (2002)	Empirical Demonstration of Inflation as associated with economic Performance	Classical Theory	VEC Model	Found that significant relationship exists between inflation rate and economic growth measured by GDP.
20	Johnson (2002)	Effect of Inflation on Economic Growth	Classical Theory	OLS	The study found a significant and inverse relationship between inflation and economic growth measured by GDP.
21	Folorunsho (2002)	Relative Effectiveness of monetary and fiscal Policies in Nigeria	Monetarist Theory	OLS	Found that monetary policy and fiscal policy exerts a greater impact on economic activity in Nigeria and documented that a significant relationship exist between Monetary Policy and economic growth.
22	Atta Mensah and Bawumia (2003)	Effect of Inflation on Monetary Policy	Keynesian Theory	Vector Error Correction	Discovered a Significant effect of inflation on key monetary policy instruments such as M2 and Interest rate.
23	Lederman and Maloney (2003)	Empirical Relationship Between Trade Structure and Economic Growth	Keynesian Theory	OLS	The study found a significant Relationship between volume of net trade, economy openness, inflation and economic growth.
24	Hnatkovasta and Loayza	Relationship Between	Keynesian Theory	OLS	Money supply showed negative and significant relationship with

	(2004)	Macroeconomic volatility and long-run Economic Growth			inflation rate.
25	Roux (2004)	Establishing Relationship Between Inflation and Money Supply	Monetary Theory	Cointegration Test	Study found a significant relationship between inflation and money supply represented by M1 and M2.
26	Oliver and Thepthida (2005)	Effect of Real Exchange Rate on Commodity Prices	Keynesian Theory	General Equilirium model	Exchange rate did not show significant effect on price level (Inflation)
27	Canova (2005)	Effect of monetary shocks on US macroeconomic development	Keynesian Theory	OLS and Cointegration	Study showed Significant effect between monetary policy instruments and economic growth in the USA.
28	Adam and Tweneboah (2006)	Role of Macroeconomic Factor	Classical Theory	Cointegration Test, VECM	Inflation rate is significantly related; Co-integration between macroeconomic variable and prices of stock in Ghana indicated long-run relationship.
29	Nkoro (2005)	Monetary Policy and macroeconomic instability in Nigeria	Keynesian Theory	OLS	Monetary policy instruments captured by interest rate, exchange rate and money supply have significant on economic growth in Nigeria.
30	Joao and Andrea (2006)	Global Output and Inflation	Classical Theory	Structural Val approach	Inflation has Positive and significant effect on global output measured by
GDP.	Folawewo and Osinubi (2006)	Effect of monetary authority in Nigeria	Classical Theory	Rational expectation approach	Discovered that monetary policy had significant effect on the finance of govt. fiscal deficit through inflation, exchange rate and tax rates, thereby causing volatility in the rates.
32	Frederic (2007)	Reaction of Prices in the Quantity Theory of Money	Monetarist Theory	OLS	Money supply exerts a positive and significant influence on the general price level in Nigeria.
33.	Mishkin (2007)	Empirical Demonstration of Inflation as associated with economic	Classical Theory	VEC Model	Found that inflation had significant relationship with economic growth (GDP).

		Performance			
34	Cheng (2007)	Impact of monetary shock on output prices and the nominal effective exchange rate with economic variables	Monetarist Theory	Vector Auto Regression model	Negative and significant relationship; Exogenous increase in the short-term interest rate tend to be followed by a fall in prices and appreciation in exchange rate.
35.	Gambetti (2008)	The Contributions of Policy Shocks to the Dynamics of Inflation	Keynesian Theory	Medium Scale Structural Model	Inflation rate had inverse and significant effect on monetary policy instruments such as interest rate, broad money supply and monetary policy rate.
36	Serkan (2008)	Role of Macroeconomic Factor	Classical Theory	Cointegration Test, VECM	Inflation rate is significantly related; Cointegration between macroeconomic variable and prices of stock in Ghana indicated long-run relationship
37	Lozano (2008)	Evidence of long-term relationship between Inflation and Money Growth	Classical Theory	VECM	There is a close and significant relationship between inflation and money growth.
38	Olubusoye and Oyaromade (2008)	Sources of Fluctuation in Inflation rate in Nigeria	Quantity Theory of Money	Error Correction model	Money supply and economic growth have negative and significant relationship with inflation rate in the short and long-run period with a significant speed of adjustment.
39	Chuku (2009)	Effects of Monetary Price Innovations in Nigeria	Monetarist Theory	Structural Vector auto regression Model	No significant relationship was observedmonetary policy innovation had a neutral and fleeting effect on output.
40	Suleman, Wasti, Lal and Hussaini (2009)	Money Supply, Output and Prices in Pakistan	Monetarist Theory	OLS	Positive and significant; Broad Money (M2) positively impact on prices in the economy
41	Uchendu (2009)	Efficacy of monetary Policy	Classical Theory	OLS	Monetary policy instruments such as interest rate, MPR and M2 showed a negative and significant relationship with inflation.
42	Dotimi (2009)	Monetary Policy and Macroeconomic Stabilization in Nigeria	Quantity Theory of money	OLS	Study found an Insignificant Influence of interest rate on Price stability.

43	Daferighe and Aje (2009)	Impact of real Gross Domestic Product in stock market	Keysian Theory	OLS	There was a Positive and significant relationship between GDP, market capitalization and broad money supply, M2.
44	Anosike (2009)	The analysis of multiple regression data in the effectiveness of monetary policy	Monetarist theory	OLS	Monetary policy instruments showed Significant influence on economic growth.
45	Chuku (2009)	Monetary Policy shocks in output and prices in Nigeria	Keynesian Theory	Structural vector auto regression (SVAR)	Study revealed a Significant relationship between M1, M2, MRR, REER, GDP.
46	Idowu (2010)	Efficacy of monetary policy in Nigeria	Monetary Theory	OLS	Study showed a Negative and significant relationship between monetary policy variables and economic growth.
47.	Omoke and Ugwanyi (2010)	Long-run study of money, Price and Output in Nigeria	Monetarist Theory	Cointegration , Granger Causality	Significant relationship; Money supply Granger cause both output and inflation
48	Okpara Nwoha (2010)	Effect of money supply on Price level	Monetary theory	A two-stage least square method, cointegration and Casuality Test	The study measured money supply using M1 and M2 and found a Positive and significant relationship inflation rate and GDP.
49	Adofu, Abula and Audu (2010)	Impact of interest rate deregulation in the Nigerian economy	Keynesian Theory	OLS	Study showed that interest rate had Positive and significant effect on economic growth of Nigeria measured using GDP.
50.	Eregha (2010)	Variations in interest rate and price stability in Nigeria	Classical Theory	OLS and instrumental variation technique	It was observed from the study that interest rate and inflation rate had negative and highly significant relationship.
51	Chimobi and Uche (2010)	Relationship Between money, inflation and output in Nigeria	Monetarist Theory	Cointegration and Granger causality	Discovered monetary stability can contribute towards price stability in Nigeria. Money supply has significant effect on inflation and output.
52	Enoma (2011)	Impact of Exchange rate on Inflation in Nigeria	Monetarist Theory	OLS	Discovered that rate of depreciation of exchange rate, money supply and real GDP are the main determinant of inflation and

					are significantly related.
53	Saibu and Nwosa (2011)	Effect of monetary policy in sectoral output growth in Nigeria	Quantity Theory of money	Auto regression distributed lag (ARDL)	It was discovered that monetary policy instruments such as M2 and interest rate exerted insignificant effect on GDP used to measure economic output growth.
54	Sanchita and Rina (2011)	Analytical work in monetary policy	Monetarist theory	Cointegration test	Significant relationship. Classical transmission of the monetary policy is useful in influencing the price.
55	Umaru and Zubairu (2012)	Impact of inflation on Economic growth and development in Nigeria	Monetarist Theory	OLS	Inflation rate was discovered to have aPositive and significant effect on economic growth (GDP).
56.	Onyeiwu (2012)	Monetary policy and Economic growth in Nigeria	Monetarist theory	OLS	The study discovered that key monetary policy instruments such as LR, M2, MPR and TBR showed Positive and significant impact on GDP

Source: Author's computation of reviewed literature, 2018

2.5 Gap In Literature

From Table 4 and other reviewed literature, most of the works done to examine the effect of monetary policy on economic development in Nigeria revealed the following gap;

i. Most of the works reviewed to the best of researcher's knowledge, studied effect or impact on economic growth using gross domestic product (GDP) as proxy to measure economic growth. (Umaru and Zubairu, 2012; Saibu and Nwosa, 2011; Sanchita and Rina, 2011)

ii. There were clear inconsistencies and disagreements in some of the results obtained by various researchers particularly when compared with the apriori expectations. (Mohammed and Ahmed, 1995: Taylor, 1995; Umaru and Zubairu, 2012; Saibu and Nwosa, 2011)

iii. There were very limited current literature on study subject

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

i. This work focused on the effect of monetary policy on economic development, which we consider a larger (broader) spectrum of study compared to economic growth.
ii. The researchers used **Human Development index** as proxy, as put forward by the united nations development project (UNDP) 2016, which measures per capita increase in living standard of a country's citizens to capture Economic development.
iii. Present a more current work on the subject (1986-2016) and add to existing literature.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The study adopts the *hypothetico-deductive research* design, is an approach of a proposed description of scientific method. According to it, scientific enquiry proceeds by formulating an hypothesis in a form that can be falsifiable, using a test on observable data where the outcome is not yet known. It considers the standard experimental techniques of largely scientific discipline. The experiments most often treated as true science and employs traditional statistical and mathematical sets in order to measure outcome conclusively. Therefore, the quantitative experiments takes account of all standard formats with a less minor interdisciplinary gap for developing a hypothesis that needs to be disproved or proved. (Funnell et al, 2012).

Firstly, the data is secondary and is sourced from the Central Bank, United Nations and the Nigeria bureau for statistics sources. Secondly, the reported figures or proxies for the variables of interest are not susceptible to the manipulations or doctoring of the researcher because they are information in public domain and are easily verifiable.

This study is a systemic and objective enquiry into events, developments and experiences of the past research adopting it in determining and forecasting the present and future situations of these events. It therefore involves historical analysis of relevant data on policy instruments. Some macroeconomic variables will be used and analysed to determine their impact on Nigerian economy. The research work therefore will specify relevant models and employ appropriate statistical tools of Ordinary Least Square (OLS), Co-integration, Granger-causality and Error Correction models to estimate and evaluate the models.

3.2 Source and Nature of Data

The study made use of data mainly from secondary sources, particularly published data from research work of monetary policy department of CBN, the World Bank and the United Nations Development Project (UNDP). Secondary data were obtained from the statistical bulletin of the Central Bank of Nigeria and will be used for the analysis of the study. The study 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 were statistics and published materials from the National Bureau of Statistics (NBS), Nigerian Economic Society, Newspapers, Magazines, Journals, Seminar papers as well as previous lecture notes and similar studies conducted in this direction. The data obtained was analysed with an Econometrics text kit (Software) called E-view –Version 9.

The data used for this study are those relating to:

1. Human Development Index (HDI) - Dependent Variable
2. Broad Money Supply (M_2); Currency in circulation (CC), Demand Deposit (DD) and Quasi Money (QM) - Independent variables
3. Open market operation variables (OMO); Treasury Bill Rate (TBR), CBN Treasury Certificates – Independent variables
4. Discount window variables (DIR); Monetary Policy Rate (MPR), Interest rate (INTR) – Independent variables
5. Reserve variables (RER); Cash Reserve Ratio (CRR), Liquidity Ratios – Indep

3.3 Model Specification and Validation

This research work adopts the foundation model of Irving Fisher (1911) and expanded it with modifications to suit our research work;

MV = PT …….eq. 1

Where M = the quantity of money in the economy

V = the velocity of circulation being the rate at which each unit of money moves through the economy in a stated period.

P = Price level

T = Aggregate Demand or Transaction = Gross Domestic Product (GDP)

Hence, T = MV/P = MV (1/P) ……..(2)

1/P, which is price level measures inflationary trend associated with aggregate demand,

Thus, price level is inversely related to aggregate demand and denoted by INFR (Inflation) in our model.

M= M_2 =Currency + Savings Deposit + Demand Deposit + Time Deposit + Other Liab. .. (3)

National Income,Y = Consumption + Investments + Government Expenditure (G) = GDP..(4)

Therefore, GDP = CC + SD + DD + TD + QM + Dir + Rer + Omo + Infr …….(5)

In our work, we replace GDP with HDI (Human Development Index) and further modifying above equation 5;

$$HDI = a_0 + a_1 M_2 + a_2 DIR + a_3 RER + a_4 OMO + a_5 INFR + U_t \quad \ldots (6)$$

Disaggregating the variables, we have;

$$HDI = a_0 + a_1 CC + a_2 DD + a_3 QM + a_4 MPR + a_5 INTR + a_6 LR + a_7 TBR + a_8 CBTC + a_9 INFR + U_t \quad \ldots\ldots\ldots\ldots\ldots (7)$$

Where HDI = Human Development Index

M_2 = Money Supply

DIR = Discount Rates

RER = Reserves Ratios

OMO = Open Market Operations

CC = Currency in Circulation

DD = Demand Deposit

QM = Quasi Money

MPR= Monetary Policy Rate

INTR= Interest Rate

LR = Liquidity Ratio

TBR = Treasury Bill Rate

CBTC = Central Bank Treasury Certificate

INFR= Inflation Rate (Acting as a moderating/control variable)

a_0, a_1, a_2 ,a_3,a_4, a_5 , a_6 , a_7 , a_8 , a_9 and a_{10} - are parameters

U_t = Error term

A discussion on monetary policy in relation to economic development could be based on economic variables such as Money Supply (M2), Monetary Policy Rate, Interest Rate, Cash

Reserve Requirement, Liquidity Ratio, Central Bank Treasury Certificate and Treasury Bill Rate. This is because monetary policy has been defined by Taylor (1993), as the combination of measures intended to regulate the value, supply and cost of money in an economy, in agreement with the expected level of economic activity, so as to achieve some specified macroeconomic objectives such as price stability etc.

The functional relationship between dependent and the independent variables that will be used in our study are established as follows.

Model I:

HDI =f(M2), ... (8)

Transforming to multiple linear relationship;

$HDI = a_0 + a_1CC + a_2DD + a_3QM + a_4INFR + u$ ..... (9)

$\mu = Error\ term$

$ao = Intercept$

$a_{1\_}a_4 = parameters/\ coefficients$

Model II:

HDI =f(DIR) ..... (10)

Transforming to multiple linear relationship;

$HDI = b_0 + b_1MPR + b_2INTR + b_3INFR + u$..... (11)

$\mu = Error\ term$

$bo = Intercept$

$b_{1\_}b_3 = parameters/\ coefficients$

Model III:

HDI =f(RER) ..... (12)

Transforming to multiple linear relationship;

HDI = c_0 +c_1LR + c_2INFR+ u ..... (13)

$\mu = Error\ term$

$c0 = Intercept$

$c_{1\_}c_2 = parameters/\ coefficients$

Model IV:

HDI =f(OMO) ..... (14)

Transforming to multiple linear relationship;

HDI = d_0 + d_1TBR + d_2CBTC + d_3INFR + u ..... (15)

$\mu = Error\ term$

$do = Intercept$

$d_{1\_}d_3 = parameters/\ coefficients$

3.4 Description of Variables

This study focuses on the Effect of monetary policy on economic development of Nigeria from 1986 to 2016. The focus area of study is thus on Nigerian monetary policy and the sample size and period covered is 30 years from 1986 to 2016.

The various variables of study include the the dependent variable, Human Development Index and the independent variables namely money supply, monetary policy rate, cash reserve ratios, treasury bill rates and inflation rate or consumer price index (which acts as control variable) and these are explained below;

Broad Money Supply (M_2)

Money supply will be used as one of the independent variables in each of the model. It is exogenously determined by the government. An excess supply in an economy results in an excess demand for goods and services, which could cause rising prices. On the other hand, an inadequate supply of money could induce stagnation thereby retarding growth and development. The monetary authorities attempt to keep the money supply growing at an appropriate rate to ensure sustainable economic growth and price stability through the use of effective monetary policy instruments.

Currency in Circulation (CC)

Currency in circulation refers to total money in circulation outside the banking system. Statistics of currency in circulation are readily available on a month to month basis. The are computed from the monthly returns of commercial banks. Since currency holding reflects a community's demand for transaction balances, its magnitude will fluctuate with business peaks and troughs.

Demand Deposit (DD)

Demand Deposit is defined to mean the aggregation of deposits of state, local government and parastatals at the CBN, and at the deposit-money banks plus the deposits of the private sector and non-financial public companies at the deposit money banks (Onoh, 2013). Currency and demand deposit liabilities are important monetary aggregates, which feature prominently in money supply equations.

Quasi Money (QM)

Savings and time deposits constitutes *quasi-money* or near money. In Nigeria's monetary statistics, quasi money is defined to consist of savings, time deposits and foreign currency deposits of commercial banks and merchant banks, excluding takings from Discount Houses.

Savings deposits unlike demand deposits receive market determined interest income. They attract the lowest market rates. Many banks are reluctant to accept small savers because of the high costs of administering those accounts.

Monetary Policy Rate (MPR)

Monetary Policy Rate (Formally Minimum Rediscount Rate) here is presented as an explanatory variable. It is considered a major tool of monetary policy because its adjustment by the monetary authority leads to a better regulation of availability of funds in the economy. It is the rate at which the Central Bank lends money to commercial banks, discount houses and other financial institutions. It is expected that the CBN exercise considerable control over MPR through its influence on the supply and demand for balances at the Central bank. Equally the MPR is expected to influence both GDP and exchange rate positively, while it is expected to have a negative influence on inflation.

Interest Rate

Interest rate is said to be the charge for the use or for borrowing money while in economics it is regarded as payment for the service of capital. Interest rates represents the market mechanism by which funds are lent and they govern who can afford to borrow these funds. They also represent the way in which banks and other financial institutions make money as they react to the return on the use of their resources.

Cash Reserve Ratio (CRR)

Cash Reserve Ratio (CRR) is one of the regressors employed in each of the models. It is the minimum ratio of cash holdings or requirements to total current liabilities of banks and other financial institutions. It is used as a guard against the collapse of such institutions due to lack of

public confidence in their ability to repay deposits. However, the variations in CRR affect the liquidity position of banks and their lending ability. It is therefore expected that an increase in CRR will lead to decrease in inflation rate, a decrease in economic growth.

Liquidity Ratio (LR)

It is the percentage of deposit liabilities which the commercial banks must hold in the form of liquid assets. The ratio was fixed at 25 per cent of a commercial bank's total liabilities (Onoh, 2013). It is regarded as total current assets less stocks.

Treasury Bill Rate (TBR)

The Treasury Bill (TBR) rate is the short term interest rate for government securities. The Open Market operation is traded by the Debt Management Office (DMO) in collaboration with the CBN and other participating banks using the Nigeria Treasury Bills (NTBs). Increased issuance of treasury securities in the primary markets mops up excess liquidity in the system thereby reducing inflation. This instrument however is used for expansion or contraction of liquidity depending on the economic situation at a point in time. Therefore, the aprori expectation is that there exists a negative relationship between the Treasury Bill Rate and Inflation, a positive relationship between Treasury bill rate and economic growth.

Central Bank Treasury Certificate

Treasury certificate is a short term loan from the Central Bank when the Nigerian federal ministry of finance needs to borrow.

Inflation Rate

In this work, Inflation Rate (INFR) will be used as an independent and control (moderating) variable in each of the models. It will be used in this research so that the input level of money supply, Treasury Bill and the other explanatory variables of monetary policy will be determined since it exerts. A multiplier effect on both sides of the equations and the general price levels.

Human Development Index

Is an economic model that considers intrinsic personal factors not considered in economic growth, such as literacy rates, life expectancy and poverty rates.

3.5 Apriori Expectations

The apriori expectation from such a study will be a positive and significant relationship between Human Development index and the various monetary policy variables such as money supply (currency in circulation, demand deposits, and Quasi money),discount window variables (monetary policy rates, interest rates), reserve mechanism variables (cash reserve ratios and liquidity ratios) and open market operation variables (treasury bill rates and Central Bank treasury certificate) (Onyeiwu, 2012).

3.6Techniques of Data Analysis

The research work will employ the following techniques for analysis:

i. Descriptive Statistics
ii. The Unit Root/Stationarity Test
iii. Ordinary Linear Regression Test
iv. The Co-integration test
v. Engel-Granger Error Correction Mechanism (ECM)

3.6.1 Unit Root Test

The empirical analysis will start 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 below:

$$\Delta X_t = \alpha + \beta t + \delta X_{t-1} + \varepsilon_t$$

Where X in the above equation is the variable under consideration. Thus, the ADF unit root test states that H_0: β=0 and H_1: β<0, where the ADF statistics was compared with the observed Mackinnon critical values.

The formulated models will be tested for stationary using the Augmented Dickery Fuller Unit root test to be sure that one is not analysing inconsistent and spurious relationship. A series that exhibits a stochastic trend, or even simply wanders around at random will not be stationary and cannot be forecast far in the future. Stationary series will constantly return to a given value and no matter the starting point, in the long- run, it is expected to attain that value (Hall, 1994). To illustrate the use of Dickey Fuller test, one can state the autoregressive AR (1) process. Thus,

$Y_t = \mu + pY_{t-1} + \varepsilon t$

Where μ and p are parameters and εt is the white noise assumption. Y is a stationary series if -1<p<1. Nevertheless, the above description is valid only if the series is an AR (1) process. If p =1, Y is a non- stationary series (a random walk with drift). The hypothesis of a stationary series can therefore be evaluated by testing whether the absolute value of p is strictly less than one (Dickey and Fuller, 1981). Thus, H_0: p =0 and H_1: P<1. If the series is correlated at higher order lags, the assumption of white noise disturbance is violated and the ADF test makes a parametric

correction for higher order by assuming that the Y series follows an AR(p) process. The test methodology is then adjusted by adding lagged difference terms of the dependent variable Y to the right hand side of the regression. Thus,

$$\Delta Y_t = \mu + \gamma Y_{t-1} + \delta_1 \Delta Y_{t-1} + \delta_2 \Delta Y_{t-2} + \ldots\ldots\ldots\ldots + \delta_{p-1} \Delta Y_{t-p+1} + \varepsilon_t$$

The hypothesis for the augmented specification is tested thus; H_0: $\gamma<0$.

A non- stationary series could be made stationary by differencing once or twice. This is called an integrated series. It could be integrated of order 1 which is often denoted as I (1) or order 2 represented by I(2). The stationary linear combination of the variables under consideration is called cointegration equation (Engle and Granger, 1991).

That variables are co- integrated, implies that they share a long-run relationship and will move closely together over time; meaning that the difference between such variables are stable over time and there is some degree of convergence in the long- run.

To test for cointegration, Johansen's (1991) method is to test the restrictions imposed by cointegration on the unrestricted vector auto- regressions (VAR) involving the series. If the VAR is of order P, the starting equation can be stated as:

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i-1} \prod_i \Delta Y_{t-i} + BX_t + \varepsilon_t$$

3.6.2 Test for Serial Correlation

In a time series or panel data model, this is correlation between the errors in different time periods. A series is said to be serially correlated where the data are correlated across time and the errors arise from adjacent time periods. It could either be positive or negative serial correlation:

$$\text{Corr}\ (u, u_s) \neq 0$$

A suspicion of serial correlation may be corrected using;

The Durbin-Watson (DW) Statistics: A test for first order autocorrelation, i.e. a test for whether a (residual) series is related to it's immediately prceeding values. One way to motivate the test and to interprete the test statistic would be in the context of a regression of the time t error on its previous value. (Durbin and Watson, 1951).

$$U_t = pu_{t-1} + v_t$$

Where: u_t= Error term at time t; p = Probability values; v_t= Variable at time t.

The Breusch-Godfrey Statistics: This is a joint test for autocorrelation that will allow examination of the relationship between the mean of the error term and its lagged values at the same time. The Breusch-Godfrey test is a more general test for autocorrelation up to the rth order (Godfrey 1978, Pagan and Godfrey 1979).

3.6.3 Test for Heteroscedasticity

This is when the assumption of homoscedasticity is violated by the variables in the model. It is a situation where the variance of the error term is not constant. The presence of this error will make the regression estimators not to be best linear unbiased estimators (BLUE) any longer. Ways to correct this will include use of Arch tests (1980); Generalized Least Square (GLS); Use of log-linear models (Brooks, 2014).

3.6.4 Test for Multicollinearity

This is said to exist when the same explanatory variable is inadvertently used twice in a regression and in such a case the model parameters cannot be estimated. This can be corrected by: ignoring it; dropping one of the collinear variables or by transforming the highly correlated variables (Brooks, 2014).

3.6.5 Test for Ramsey Reset Specification

Ramsey's (1969) Reset test is a general test for misspecification of functional form. It is also known as non-linearity test. It reveals a situation where the share of the regression model estimated is linear but it should have been non-linear. It is essentially a model stability tests and helps to give strong level of reliability to the results of the model.

3.6.6 Regression Analyses

The Classical Linear Regression Model (CLRM) which represents the foundational model for most higher and vigorous econometric analyses form the most fundamental technique of data analyses for this work. The Eviews Generalized Least Square (EGLS) method was used as it captures the required robustness and flexibility required for a panel data research work. Regression analyses is basically concerned with the study of the dependence of one variable (dependent variable) on one or more other explanatory or independent variables (regressors) with the view to finding out or estimating/predicting the mean or average value of the former in terms of known or repeated values of the latter (Gujarti and Porter, 2009).

In specific terms, regression analyses explains the variation in an outcome (dependent variable) Y, as it depends on a predictor (independent explanatory) variable X. it is a correlation based test. Correlation is one of the most common and useful statistics. It describes the degree of relationship between two variables.

Its predictive power is dependent on the estimation of the relationship between X and Y variables. The accuracy of such predictive capability depends on the amount of scatter: the less the scatter, the more the predictive accuracy. Stokewell, (2008) opines that correlation and regression is used when there is an

alleged linear relationship between two or more variables beyond what is expected by chance. There is a hypothesized linear relationship between market capitalization and foreign direct investment. Essentially, the use of this econometric technique is necessitated by the fact that this work studies the dependence of Stock Market capitalization on foreign direct investments. This implies that the regression model would use foreign direct investment as a variable that explains changes in stock market growth. Hence, foreign direct investment is the regressor or independent variable while stock market capitalization is the dependent variable. Additionally, the following regression-based tests shall be conducted.

3.6.7 Test For Significance (T-Statistic or Z-Statistic)

The p-value of the t-statistic or z-statitistics will be used to test the significance of the overall regression using Generalized Least Square and the significance of the parameter estimates respectively. The chosen level of significance for this research work was 5% (except otherwise stated). The p-value from the computed E-views table is compared with the p-value of the z-statistics from the Z-normal distribution table otherwise. If the p-value from the computed E-views is greater than the p-value from the z-distribution table, the relationship is said to be significant, otherwise it is not significant. (Brooks, 2014)

This is a procedure by which sample results are used to verify the truth or falsity of a null hypothesis in the tests as conducted and reported, Lehman, (1959).

The key idea behind the significance of the parameter estimates is that of **test statistic** (estimator) and the sampling distribution of such under the null hypothesis. The hypothesis is stated thus according to Gujarati and Porter (2009):

H_0: βi=0

H_A: $\beta i \neq 0$

The decision to accept or reject H_0 is made on the basis of the value of the test statistic obtained. If Z* falls in the acceptance region, the null will be accepted but will be rejected if it falls outside the acceptance region. If the null hypothesis is accepted, it indicates that the parameters are not statistically significant. On the other hand, it is statistically significant if the value of the test statistic lies outside the acceptance region hence H_A will be accepted, Osuala, (2010).

Decision rule: Using Panel data Generalized Least Square (GLS), accept Null hypothesis (H_o) if the computed Z-statistics or T-statistic p-value (Z_{PV} or T_{pv} Computed) is greater than the chosen level of significance and conclude that there is no significant relationship between the tested variables of interest, otherwise reject.

T-statistics or Z-statistic is a test of significance of the overall regression and it points out whether a significant relationship exists amongst all the variables fitted into the regression model. It specifically measures the goodness of fit of the model, Hill and Williams (2001).

3.6.8 Correlation Coefficient

This is generally used to measure the strength of linear relationship between two or more variables and as such will be adopted to measure the degree of the relationship between stock market capitalization and individual variants of foreign direct investments and gross domestic product.

3.6.9 Co-Efficient Of Determination

This statistical tool is employed for better interpretation of result. It explains the degree of variation in stock market capitalization as explained by its relationship with foreign direct investments. This will

principally be used at the point that this work will test Stock market capitalization against all the variants of foreign direct investments and gross domestic products combined in a multiple regression. Multiple coefficient of determination (R^2) is used to measure such variations in y-variable which is explained by the independent variables- x_1, x_2 and x_3.

3.6.10 Co-integration Test

Johansen's Approach

The basic argument of Johansen's procedure is that the rank of matrix of variables can be used to determine whether or not the two variables are co- integrated. The Johnansen's methodology consists of the following four steps: (Johansen, 1991).

1. In order to check the order of integration, we pre-test all the variables. Then we plot the data in order to ascertain whether there is linear time trend in the data generating process. We must proceed carefully regarding the use of lag length. In order to get results which are not sensitive to lag length we estimate vector auto- regression using the indifference data. This is most common practice in estimation.
2. Estimate the model to determine the rank of the matrix of variables. It is important to note that the residual of the estimated models must be carefully interpreted and analysed. If there is any evidence that errors are not white- noise usually means that lag lengths are too short.
3. Analyse the normalized co- integrating vectors and the speed of adjustment co- efficient.
4. Innovation accounting, if coupled with causality test on the error model facilitates in finding a structural model and shows to what extent the estimated model is reliable and reasonable. For hypothesis testing, consider the hypothesis that the variables are not co- integrated implying that the rank of the matrix of variables is equal to zero.

Summarily, the first stage of co- integration and error correction techniques is the test for unit root. The whole analysis then proceed form it. Consequent upon the above, these macroeconomic variables (INFR, EXR, GDP, M_2, MPR, CRR, TBR) will all be subjected to a unit root test to determine their time series characteristic.

As noted by Maddala (1990), testing for unit roots is a formalization of the Box- Jenkins approach of differencing the time after a visual inspection of the correlogram. The analyzing of and testing for unit roots naturally lead to the theory of cointegration (Iyoha and Ekanem, 2002). This is because, basically, cointegration deals with methodology of modelling non-stationary time series variables and the idea rest on the thesis that even though two time series may not themselves be stationary, a linear combination of two non- stationary time series are said to be "cointegrated" (Iyoha and Ekanem, 2002). Usually, for cointegration, the two time series have to be of the same "order" that is they should be stationary after the same number of differencing.

The Engle and Granger Method

Granger's (1969) representation theorem asserts that if the coefficient matrix // has reduced rank $r<k$, then there exist $k\ xr$ matrices α and β each with rank r such that // = $\alpha\beta$ and βy_t is stationary. *R* is the number of cointegrating relations (the cointergating rank) and each column of β is the cointegrating vector. The elements of α are known as the adjustment parameters in the vector error correction model. Johnsen's method is to estimate the // matrix in an unrestricted form, then test whether we can reject the restrictions implied by the reduced rank of //.

The presence of cointegration forms the basis for error correction model specification. The dynamics is then specified in an error correction model (ECM_t), incorporating the one period lagged residual from the static regression. The error correction model is designed to capture the

short- run deviations that might have occurred in estimating the long- run co-integrating equation (Engle and Granger, 1987).

3.6.11 Error Correction Mechanism (ECM)

This research employed Engel and Granger cointegration and Error Correction Model (ECM) technique, the Johansen system of cointegration test will be employed equally.

Thus, the models will be re- specified as follows to include an error correction term (ECM).

HDI = $\propto_0 + \propto_1 M2 \ \propto_2 MPR + \propto_3 CRRt + \propto_4 TBR_t + ECM_{t-1} + \mu_t$ .....(4)

The following test will also be conducted.

i. The coefficient of determination (R^2) test: In this case R^2 will be used purely as a measure of the goodness of fit that is the measure of the explanatory power of the model.

ii. The estimated regression co- efficient of each of the selected explanatory variables to check whether they are significantly different from zero.

iii. The F- test to determine the joint significance of the explanatory variables, that is the overall significance of the models. Conventionally, F-test will be required to test the overall significance of the model. The F-ratio computation is expressed as:

$F^* = \sum(Y-Y)^2$

If the ratio is greater than the critical value determined for a given level of significance, then the regression model is significant.

Decision: Compare F_{cal} and F_{tab} to either accept or reject.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

This chapter presents the data sets collected and collated from the statistical bulletins of Central bank of Nigeria, National Bureau of Statistics and the United Nations Development Projects (UNDP) on Nigeria for the periods under study (1986-2016).

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

4.1.0 Data Presentation

4.1.1 Tabular Data Presentation for Nigeria Selected Macroeconomic Variables

Table 4.1 : Nigeria Selected Monetary Policy Variables from 1986 to 2016

Year	CC (% OF M2)	DD (% of M2)	QM (% OF M2	MPR	INTR	CRR	LR	TBR	CBTC	HDI	INFR
1986	0.211	0.322	0.467	0.0850	0.1050	0.017	0.364	0.1000	0.090	0.258	0.1367
1987	0.210	0.287	0.503	0.1175	0.1375	0.014	0.465	0.1275	0.1225	0.269	0.0969
1988	0.220	0.274	0.506	0.1175	0.1375	0.021	0.450	0.1275	0.1225	0.280	0.6121
1989	0.253	0.303	0.444	0.1750	0.1950	0.029	0.403	0.1875	0.1638	0.291	0.4467
1990	0.230	0.343	0.427	0.1750	0.1950	0.029	0.443	0.1850	0.1820	0.302	0.0361
1991	0.268	0.305	0.427	0.1500	0.1700	0.029	0.386	0.1450	0.1500	0.313	0.2296
1992	0.286	0.300	0.414	0.2100	0.2300	0.044	0.291	0.1750	0.2200	0.324	0.4880
1993	0.293	0.312	0.395	0.2690	0.2890	0.060	0.422	0.2600	0.2740	0.335	0.6126
1994	0.333	0.304	0.358	0.1250	0.1450	0.057	0.485	0.1350	0.1300	0.346	0.7676
1995	0.340	0.302	0.356	0.1250	0.1450	0.058	0.331	0.1350	0.1300	0.351	0.5159
1996	0.310	0.331	0.359	0.1225	0.1425	0.075	0.431	0.1350	0.1300	0.368	0.1431
1997	0.287	0.355	0.359	0.1200	0.1400	0.078	0.402	0.1350	0.1300	0.379	0.1021
1998	0.332	0.332	0.373	0.1295	0.1495	0.083	0.468	0.1431	0.1325	0.390	0.1191
1999	0.267	0.305	0.428	0.1700	0.1900	0.117	0.610	0.1800	0.1510	0.401	0.2200
2000	0.264	0.351	0.384	0.1200	0.1400	0.098	0.641	0.1350	0.1285	0.412	0.1453
2001	0.257	0.363	0.379	0.1295	0.2250	0.108	0.529	0.1431	0.1320	0.423	0.1649
2002	0.242	0.350	0.408	0.1888	0.1850	0.108	0.525	0.1900	0.1450	0.434	0.1297
2003	0.208	0.410	0.383	0,1502	0.1700	0.100	0.509	0.1575	0.1405	0.445	0.2381
2004	0.201	0.385	0.412	0.1425	0.1700	0.086	0.505	0.1500	0.1375	0.463	0.1001
2005	0.214	0.370	0.383	0.0700	0.1500	0.097	0.505	0.1300	0.1125	0.466	0.1157
2006	0.1880	0.3386	0.4734	0.1485	0.1400	0.042	0.505	0.1225	0.0775	0.477	0.0855
2007	0.1270	0.4094	0.4636	0.0691	0.0950	0.028	0.500	0.0875	0.0775	0.481	0.0656
2008	0.0974	0.4325	0.4701	0.0955	0.0975	0.030	0,455	0.0981	0.0561	0.487	0.1506
2009	0.0860	0.3794	0.5346	0.060	0.0800	0.013	0.455	0.0744	0.0400	0.492	0.1220
2010	0.0939	0.3895	0.5166	0.0650	0.0825	0.010	0.405	0.0749	0.0758	0.500	0.1370
2011	0.0936	0.4154	0.4910	0.120	0.1400	0.100	0.405	0.1485	0.1427	0.509	0.1080
2012	0.0841	0.3952	0.5207	0.120	0.1400	0.120	0.400	0.1117	0.1177	0.514	0.1220
2013	0.0793	0.3635	0.5572	0.120	0.1400	0.120	0.350	0.1081	0.1097	0.521	0.8500
2014	0.0760	0.2896	0.6344	0.130	0.1500	0.200	0.350	0.1120	0.1080	0.525	0.0800
2015	0.0726	0.3553	0.5721	0.110	0.1300	0.200	0.300	0.0412	0.0457	0.527	0.0900
2016	0.0772	0.4006	0.5222	0.140	0.1600	0.225	0.300	0.1305	0.1396	0.531	0.1570

Source: CBN, NBS and UNDP (2017)

Where: CBN = Centra Bank of Nigeria.

NBS = National Bureau of Statistics

UNDP = United Nations Development Projects

CC= Currency in Circulation

DD = Demand Deposit

QM = Quasi Money

MPR = Monetary Policy Rates

INTR= Interest

CRR = Cash Reserve Ratio

LR = Liquidity Ratio

TBR = Treasury Bill Rates

CBTC = Central Bank Treasury Certificate

INFR= Inflation Rate

Comments:

Table 4.1 shows trend in the various selected macroeconomic variables used to measure Money Supply (M2)(represented by currency in circulation, Demand deposit and Quasi money) Monetary Policy Rate (MPR), Interest Rate (INTR) Cash Reserve Ratio (CRR), Liquidity Ratio (LR) Treasury Bill Rate (TBR), Central Bank Treasury Certificate (CBTC), Inflation Rate (INFR) and Human Development Index (HDI) for Nigeria from 1986 to 2016

(A 30 year period).

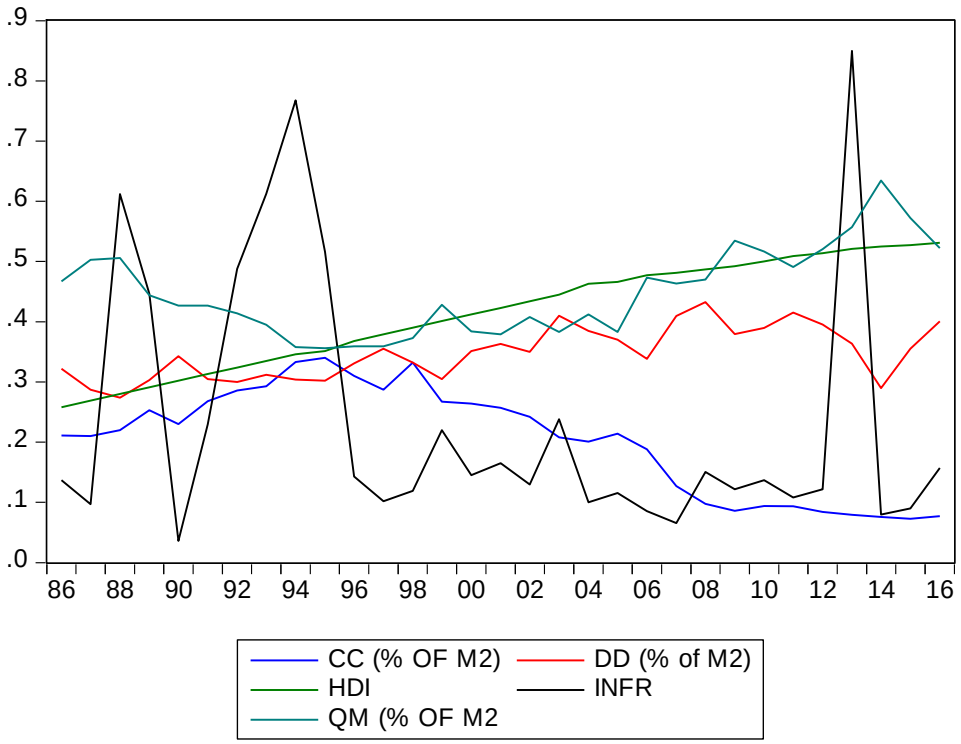
The table shows that the M2 started from a very low level of 0.0423 in 1986 with a corresponding MPR of 0.085 and anHDI of 0.258 and have grown over the period cyclically peaking at 0.5788 in 2008, MPR,0.2690 in 1993 and an HDI of 0.530 in 2016 respectively. This shows a massive growth in M2 by 1268.31%, in MPR by 216.47% and in HDI by 105.43%.

Within the same period, CRR, TBR and INFR all grew from 0.017, 0.10 and 0.1367 respectively in 1986 to 0.225, 0.1395 and 0.7676 (1994) and later dropped to 0.1570 all in 2016 respectively. Hence, the growth rates for CRR, TBR and INFR by 2016 were 92.44%, 39.5% and 461.52% respectively.

From above results, we could conveniently infer that massive growths in these monetary policy instruments namely M2,(CC, DD, and QM), MPR, INTR, CRR, LR, TBR and CBTC over this period of study have positively affected the economic development of Nigeria measured by the Human development index (HDI).

4.1.2Graphical Data Presentation for Selected Monetary Policy Variables (A)

Fig. 4.1 - MODEL I

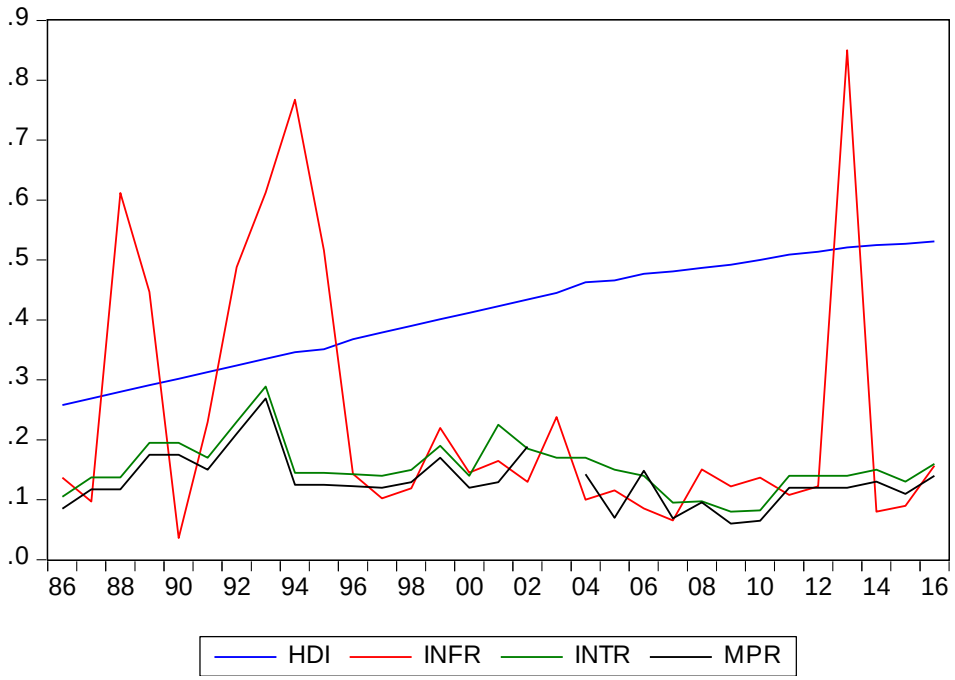


Source : Computation by author using E-view 7

Figure 4.1, shows HDI (Dependent variable) has maintained a consistent linear growth indicating that the various oscillating independent variables such as CC, DD and QM (All as percentage of M2) as well as INFR have had a positive effect on the Economic development of Nigeria measured by HDI. Hence, despite the volatility in the macroeconomic environment, which has occasioned the rise and fall of the

monetary policy variables under study, the economic managers have been able to manipulate these elements to effectively ginger developments in the economy.

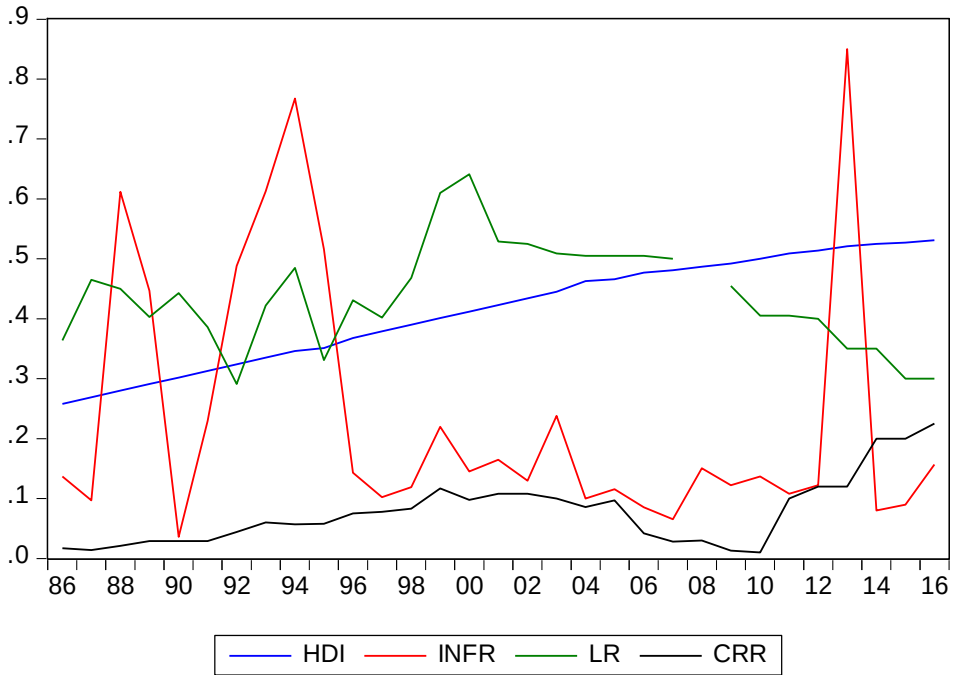
Fig. 4.2 Model II



Source : Computation by author using E-view 7

Figure 4.2, shows that MPR and INTR have both maintained and exhibited similar oscillating pattern since 1986, reaching its peak between 1992 and 1993 reaching between 21% to 29%within that period in response to macroeconomic pressures. The rates have however, maintained a consistent fall since 1994 while HDI (Dependent variable) on the other handhas maintained a consistent linear growth indicating that the various oscillating independent variables such as MPR, INTR and INFR have had a positive effect on the Economic development of Nigeria measured by HDI. Hence, despite the volatility in the macroeconomic environment, which has occasioned the rise and fall of the monetary policy variables under study, the economic managers have been able to manipulate these elements to effectively ginger developments in the economy.

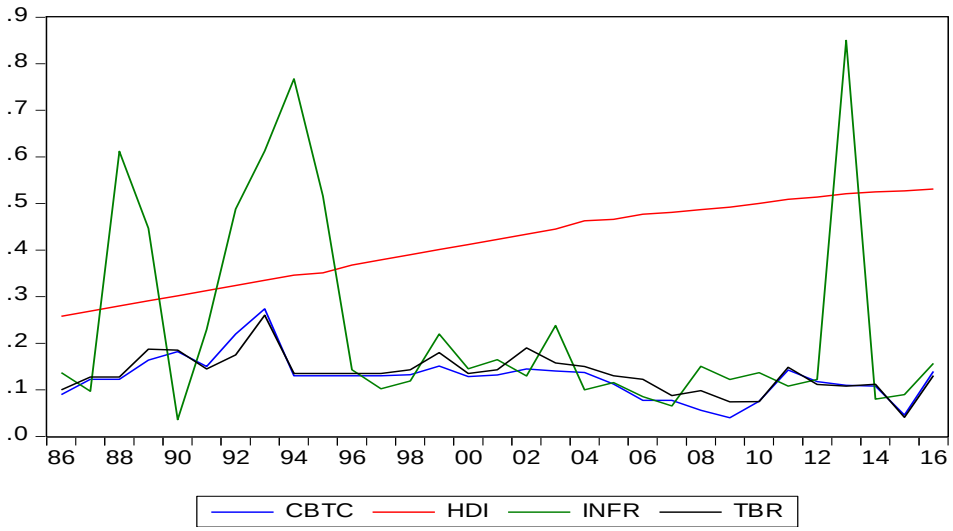
Fig. 4.3 Model III



Source : Computation by author using E-view 7

Figure 4.3, shows that while CRR has been on the rise between 1986 and 2005, it however, started falling after 2005 till 2011 before it started rising again and within the period rose over 20%. The liquidity ratio (LR) within the period grew from over 25% to about 65% in 2000 and started declining to 50% in 2006 and further to 30% in 2016. HDI (Dependent variable) again, has maintained a consistent linear growth indicating that the various oscillating independent variables such as CRR and LR have had a positive effect on the Economic development of Nigeria measured by HDI. Hence, showing effective management on the part of the economic managers and monetary authorities.

Fig. 4.4 Model IV



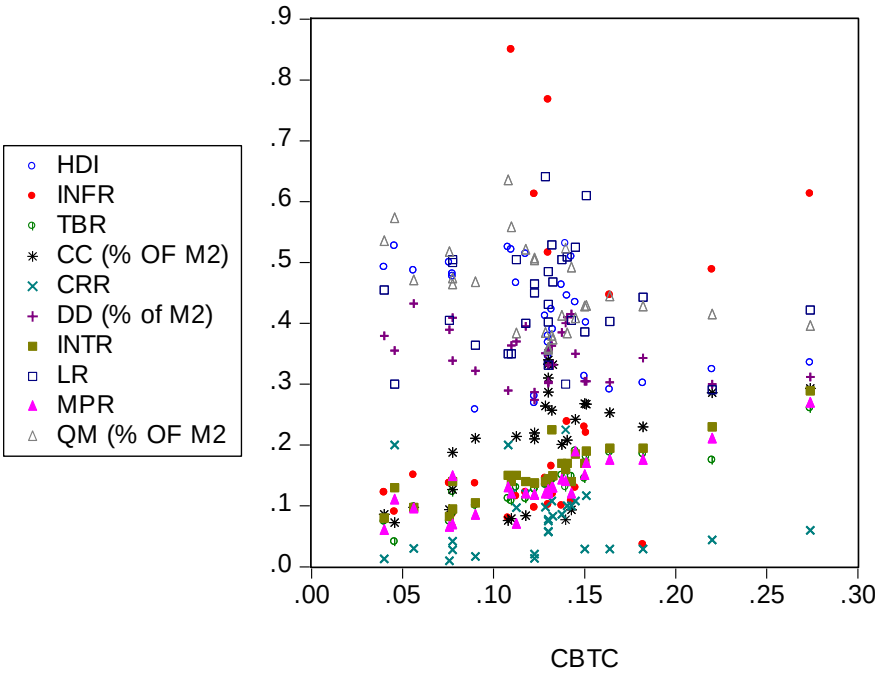
Source : Computation by author using E-view 7

Figure 4.4, shows that in the model IV, while HDI (Dependent variable) has continued to show a consistent linear growth indicating composite economic development, it will however be observed that the use of open market instruments such as Central Bank treasury certificate (CBTC) and treasury bills (TBR), to control the level of money in the economy have remained flat over the period with occasional slips in due to fall in market rates in response to economic realities of the period. The effect of these movements on economic development measured by HDI has shown positive effect on the economy.

4.1.3 Graphical Data Presentation for Selected Monetary Policy Variables (B)

Fig. 4.5 SCATTER DIAGRAM OF SELECTED MONETARY POLICY VARIABLES

Scatter Graphs are used to investigate the relationship between two or more variables for a set of paired data – Dependent and Independent variables. The pattern of the scatter describes the relationship between the variables as shown below:



Source : Computation by author using E-view 7

The scatter diagram in figure 4.2 shows CC, DD and QM (all as per centage of M2), MPR, INTR, LR, CRR and TBR (independent variables) effect on dependent variable, HDI with INFR as the moderating variable. The scatter plot shows that the monetary policy variables have not been consistent in their growth course as they have hovered between high and low levels, in essence, over the years, these monetary policy variables manipulation by the central authority have however produced significant effect on economic development as can be seen in the consistent linear growth of the HDI.

4.2 Data Analysis

4.2.1– **Descriptive Statistics and Test for Normality**

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

Table 4.2- DESCRIPTIVE STATISTICS OF SELECTED MONETARY POLICY VARIABLES

	CBTC	HDI	INFR	TBR	CIC	DD	INTR	LR	MPR	CRR	QM
Mean	0.128207	0.409724	0.241355	0.135517	0.206748	0.342431	0.155121	0.435379	0.131876	0.07813	0.450614
Median	0.130000	0.412000	0.136700	0.135000	0.220000	0.343000	0.145000	0.431000	0.125000	0.07500	0.428000
Maximum	0.274000	0.531000	0.850000	0.260000	0.340000	0.415400	0.289000	0.641000	0.269000	0.22500	0.634400
Minimum	0.040000	0.258000	0.036100	0.041200	0.072600	0.274000	0.080000	0.291000	0.060000	0.01000	0.356000
Std. Dev.	0.046560	0.089535	0.227663	0.042188	0.090157	0.040030	0.044032	0.086461	0.044522	0.05757	0.074072
Skewness	0.855987	-0.161309	1.439928	0.490164	-0.291494	0.150561	0.920144	0.338690	0.899335	0.99185	0.553367
Kurtosis	5.222684	1.652842	3.725360	4.476761	1.726260	1.921805	4.565685	2.861911	4.637905	3.45223	2.509574
Jarque-Bera	9.511004	2.318690	10.65715	3.796420	2.371098	1.514257	7.054282	0.577479	7.150847	5.00196	1.770665
Probability	0.008604	0.313692	0.004851	0.149837	0.305578	0.469011	0.029389	0.749207	0.028004	0.08200	0.412577
Sum	3.718000	11.88200	6.999300	3.930000	5.995700	9.930500	4.498500	12.62600	3.824400	2.26600	13.06780
Sum Sq.dev.	0.060700	0.224462	1.451254	0.049836	0.227590	0.044867	0.054286	0.209313	0.055503	0.09280	0.153628
Observations	29	29	29	29	29	29	29	29	29	29	29

Source : Computation by author using E-view 7

The descriptive statistics in Table 4.2 shows the basic aggregative averages like mean, median and mode for all the observations. The spread and variations in the series are also indicated using the standard deviation. Significantly, kurtosis which shows the degree of peakedness is also shown together with the skewness which is a reflection of the degree of or departure from symmetry of the given series. With all the variables showing an average kurtosis ≥ 3, there is an evidence that they are all platykurtic with MPR, CBTC, and INTR as well as the moderating variable, INFR showing significance at the 5% levels of significance with a Jarque-Bera statistics of p-values below the 5%, indicates a normal distribution.

4.2.2 DIAGNOSTIC TESTS

The aim here is to carry out various diagnostic tests to ensure that our data and model used in this research work conforms to the basic assumptions of the classical linear regression. This will ensure that the output of this process is not error prone and is reliable.

4.2.2.1: Test For Stationarity

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

Table 4.3: Unit Root Tests for Nigeria Data

Variables	ADF Test Statistics	Critical Values @5%	P-value	Order of Integration
CC	**-5.1125**	**-2.9678**	**0.0003**	**I(1)**
DD	**-6.6260**	**-2.9719**	**0.0000**	**I(1)**
QM	**-5.6764**	**-2.9678**	**0.0001**	**I(1)**
LR	**-6.1837**	**-2.9810**	**0.0000**	**I(1)**
INTR	**-7.0295**	**-2.9678**	**0.0000**	**I(1)**
MPR	**-3.2611**	**-2.9719**	**0.0268**	**I(0)**
CRR	**-9.5766**	**-2.9763**	**0.0000**	**I(2)**
TBR	**-3.4300**	**-2.9640**	**0.0177**	**I(0)**
CBTC	**-6.0354**	**-2.9678**	**0.0000**	**I(1)**
INFR	**-3.8417**	**-2.9640**	**0.0066**	**I(0)**
HDI	**-3.6948**	**-2.9640**	**0.0094**	**I(0)**

Source: Author's E-view 7 Computation

Table 4.3 reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. While MPR, TBR INFR and HDI were found to be stationery at levels with positive and significant p-values, CC, DD, QM, LR, INTR and CBTC were discovered to be stationery at first difference with positive and significant p-values but CRR was discovered to be stationery at only second levels and highly significant. At the levels, First and second difference as reported, the ADF Statistics for the respective variables were more negative than the critical values at 5% significance

level. The reported P values were all less than 0.05 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected.

4.2.2.2 - Test For Serial Correlation – Breusch-Godfrey (BG) Tests

The Breusch-Godfrey tests is used to test for the presence or absence of serial or autocorrelations in the model with the Null hypothesis stating that there is No autocorrelation. This holds if p-value is greater than the chosen level of significance otherwise reject.

Table 4.4 : Breusch-Godfrey Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.427802	Prob. F(2,6)	0.6704
Obs*R-squared	2.371267	Prob. Chi-Square(2)	0.3056

Source: Author's E-view 7 computations (See Appendix 3 for details)

From table 4.4, the p-value is greater than the chosen level of significance of 5%, indicating the absence of autocorrelation in the model. This is further enhanced with a Durbin-Watson statistics of 1.90. Hence, we do not suspect any violation of the assumptions of classical linear regression. The applicable treatment was to led the variables by 5 periods (CC, DD, QM, INTR, LR, CRR, MPR, TBR, CBTC) while the moderating variable (INFR) was led by 3 periods.

4.2.2.3 Test for Heteroskedasticity (Arch)

The assumption of the classical linear regression that the variance of the errors is constant is known as *Homoskedastycity*. If the variance of the errors is not constant, this would be known as *Heteroskedasticity*. Hence, we test for the presence of heteroskedasticity with the intention of treating same if found. The treatment method adopted here is the Autoregressive conditionally Heteroscedastic test known as ARCH. The Null hypothesis states that there is no Heteroscedasticity if the p-value is greater than the level of significance (Brooks, 2014).

Table 4.5: Heteroskedasticity – Arch Test

Heteroskedasticity Test: ARCH			
F-statistic	0.699348	Prob. F(1,19)	0.4134
Obs*R-squared	0.745523	Prob. Chi-Square(1)	0.3879

Source: Author's E-views computation (See Appendix 4 for details)

The null hypothesis states that there is No heteroskedasticity if p-value is not significant and is greater than the chosen level of significance of 5%. Hence, in this case we accept the Null hypothesis that there is no evidence of heteroskedasticity since p-value is greater than 5% significance level.

4.2.2.4: Test For Multicollinearity

Table 4.6 Correlation matrix for selected Data

	C	CC(5)	DD(5)	QM(5)	MPR(5)	INTR(5)	CRR(5)	LR(5)	TBR(5)	CBTC(5)	INFR(3)
C	0.212537	-0.190874	-0.201421	-0.213668	0.062843	-0.040874	0.008581	-0.006340	-0.041860	-0.005981	-0.005506
CC(5)	-0.190874	0.179503	0.182552	0.193567	-0.056754	0.036324	-0.005221	0.002018	0.037107	-0.002538	0.003328
DD(5)	-0.201421	0.182552	0.202410	0.196997	-0.048055	0.037853	-0.007109	0.002613	0.035787	-0.003476	0.004391
QM(5)	-0.213668	0.193567	0.196997	0.219611	-0.072601	0.042117	-0.009813	0.005601	0.050165	0.005311	0.005472
MPR(5)	0.062843	-0.056754	-0.048055	-0.072601	0.083404	-0.039399	0.004429	0.001737	-0.059095	0.003293	NA
INTR(5)	-0.040874	0.036324	0.037853	0.042117	-0.039399	0.060224	-0.008085	-0.002289	0.015357	-0.025703	0.000754
CRR(5)	0.008581	-0.005221	-0.007109	-0.009813	0.004429	-0.008085	0.007705	-0.000505	-0.003237	0.001542	-0.000834
LR(5)	-0.006340	0.002018	0.002613	0.005601	0.001737	-0.002289	-0.000505	0.005274	-0.012955	0.014912	0.000874
TBR(5)	-0.041860	0.037107	0.035787	0.050165	-0.059095	0.015357	-0.003237	-0.012955	0.147791	-0.076116	0.002555
CBTC(5)	-0.005981	-0.002538	-0.003476	0.005311	0.003293	-0.025703	0.001542	0.014912	-0.076116	0.094668	0.001645
INFR(3)	-0.005506	0.003328	0.004391	0.005472	NA	0.000754	-0.000834	0.000874	0.002555	0.001645	0.000747

Source: Author's E-view 7 Computation

From the correlation matrix table 4.6, the result indicates significant correlation between the variables CC, DD, QM, MPR, INTR, CRR, LR, CBTC and TBR as well as the moderating variable (INFR) at 0.179503, 0.202410, 0.219611, 0.083404, 0.060224, 0.007705, 0.005274, 0.147791, 0.094668 and 0.000747 respectively. Hence, there is a no suspicion of possible multicollinearity in the treated variables as stated in the table.

4.2.2.5 Test for Ramsey Reset Specification

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

a) Omitted Variables

b) Incorrect Functional form

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

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

Table 4.7: RAMSEY RESET SPECIFICATION TEST

Ramsey RESET Test				
Equation: UNTITLED				
Specification: HDI C CC(5) DD(5) QM(5) MPR(5) INTR(5) CRR(5) LR(5)				
TBR(5) CBTC(5) INFR(3)				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	0.030749	12	0.9760	
F-statistic	0.000946	(1, 12)	0.9760	
Likelihood ratio	0.001891	1	0.9653	

Source: Author's E-views computation (See Appendix 5 for details)

The p-values in table 4.7 for t and F-statistics being greater than the 5% significance level, indicates that the test statistics are not significant at the 5% level. We thus accept the Null hypothesis that the regression model is linear.

4.3.0 Test of Hypothesis

This Sub-section tests the hypotheses stated in chapter one and modeled in chapter three.

Decision rule: We accept Null hypothesis (H_o) if the computed T-statistic p-value (T_{pv} Computed) is greater than the chosen level of significance (5% level of significance) and conclude that there is no significant relationship between the tested variables of interest, otherwise reject.

T-statistics is a test of significance of the overall regression and it points out whether a significant relationship exists amongst all the variables fitted into the regression model. It specifically measures the goodness of fit of the model, Hill and Williams (2001).

4.3.1 **Restatement of Hypothesis One**

Ho_1: There is no significant relationship between Broad money supply (M_2) represented by Currency in Circulation (CC), Demand Deposit (DD) and Quasi Money (QM), and economic development of Nigeria.

H_{i1}: There is significant relationship between Broad money supply (M_2) represented by Currency in Circulation (CC), Demand Deposit (DD) and Quasi Money (QM), and economic development of Nigeria.

4.3.1.1 OLS Regression Test for Short-run Effect

Table 4.8: Regression Result for Broad Money Supply (M2) Components – Model 1

Dependent Variable: HDI				
Method: Least Squares				
Date: 03/26/18 Time: 20:32				
Sample (adjusted): 1987 2014				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.050057	0.064118	-0.780699	0.4433
CC(2)	0.079348	0.063497	1.249633	0.2246
DD(2)	0.049352	0.067178	0.734644	0.4703
QM(2)	0.052002	0.063228	0.822447	0.4196
INFR(2)	0.000154	0.003034	0.050804	0.9599
HDI(-1)	1.007411	0.015713	64.11364	0.0000
R-squared	0.998823	Mean dependent var		0.410643
Adjusted R-squared	0.998555	S.D. dependent var		0.081689
S.E. of regression	0.003105	Akaike info criterion		-8.524257
Sum squared resid	0.000212	Schwarz criterion		-8.238785
Log likelihood	125.3396	Hannan-Quinn criter.		-8.436985
F-statistic	3733.445	Durbin-Watson stat		2.364472
Prob(F-statistic)	0.000000			

Source: Athur's computer generated Eviews result

In table 4.8, the R^2 and Adjusted R^2 both showed 99.88% and 99.86% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is 99.88% and implies that chosen explainatory variables explains variations in the dependent variables to the tune of 99.88%. Also, with a high Adjusted R^2 (99.86%) implies that the model can take on more variables conveniently without the R^2 falling beyond 99.86%, which is very commendable. F-statistics of 3733.445 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant and displays a Durbin-Watson of 2.364, which is considered good as it shows little or no effect of autocorrelation on the chosen data.

Hence, from table 4.8, the CC(2) at led2, has a t-statistic value of 1.2496 and a p-value of 0.2246, was found to have a positive effect on HDI and this effect is statistically insignificant at 5% level since its p-

value is greater than 0.05. Also, DD(2) at led 2, has a t-statistic value of 0.7346 and a p-value of 0.4703, was found to have a positive and insignificant effect on HDI. Similarly, Also, QM(2) at led 2, has a t-statistic value of 0.8224 and a p-value of 0.4196, was found to have a positive and insignificant effect on HDI. Therefore, we accept null hypothesis to reject the alternative that components of Broad money supply, M2 all have positive and insignificant effect on human development index. However, the INFR(2) at led 2, has a t-statistic value of 0.0508 and p-value of 0.9599 and this effect is positive and statistically not significant at the 5% level. The INFR is to act as a moderator to the outcome of both the dependent and independent variable. The implication of this result is that a 1% increase in M2 components (namely – CC, DD and QM) will result to a 0.0794%, 0.04935 and 0.05200 increases in HDIrespectively and the coefficient of the future levels of CC, DD and QM variables have a positive sign and is positive at the 5% significance level. This supports the view that the future levels of CC, DD and QM in Nigeria positively but insignificantly affects Human Development Index (HDI).

4.3.1.2 Co-integrationtest For Long-run Effect

Table 4.9: **Bounds Test Critical Table for Cointegration Analysis**

Critical value	Lower Bound Value	Upper Bound Value
1%	3.15	4.43
5%	2.55	3.68
10%	2.26	3.34

Source: *Pesaran et al. (2001)*

Pesaran and Shin (2001) showed that cointegrating systems can be estimated as ARDL models; it has the advantage to estimate cointegrating relationship on variables that are either I(0) or I(1). According to Pesaran *et al.* (2001), the asymptotic distribution of the F-statistic is non-standard regardless of whether the regressors are I(0) or I(1), and provide two adjusted critical values that establish lower and upper bounds of significance. The bound test follows the critical criterion at

the lower bound and upper bound value for decision at the three levels of significance in 1%, 5% and 10%.

Table 4.10: ARDL Bounds Tests for Cointegration Model 1 (Appendix A)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.092733	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Author's Computation Using EViews 10 Software

Given a computed F statistics Value of 5.092733 for HDI equations, the results of the bounds co-integration test therefore establish that the null hypothesis against its alternative is rejected at the various significance level. The computd *F*-statistic for the respective equations are greater than the lower and upper critical bound values at 1%, 2.5%, 5% and 10% respectively, thus indicating the existence of a steady-state long-run relationship among the variables. This suggest that the various selected variables have a long run relationship with human development index in Nigeria.

Decision rule: We reject null hypothesis of the co-integration relationship to accept the alternative that there is Co-integration. We thus, conclude that broad money supply as represented by currency in circulation, Demand deposits and Quasi money have a long-run effect on Economic development proxied by HDI (Human Development index).

4.3.1.3 Granger-Causality test For Model I

Table 4.11: Granger-Causality Result for model I

Pairwise Granger Causality Tests			
Date: 03/27/18 Time: 05:54			
Sample: 1986 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
DD does not Granger Cause CC	29	1.11720	0.3436
CC does not Granger Cause DD		2.41398	0.1109
HDI does not Granger Cause CC	29	4.90866	0.0163
CC does not Granger Cause HDI		3.79665	0.0369
QM does not Granger Cause CC	29	1.60572	0.2216
CC does not Granger Cause QM		8.68076	0.0015
HDI does not Granger Cause DD	29	5.61735	0.0100
DD does not Granger Cause HDI		1.64605	0.2138
QM does not Granger Cause DD	29	2.85337	0.0773
DD does not Granger Cause QM		8.20289	0.0019
QM does not Granger Cause HDI	29	5.21112	0.0132
HDI does not Granger Cause QM		4.03411	0.0309

Source: Author's E-views computation

The result in table 4.10 shows that broad money supply components such as currency in circulation (CC) granger-causes HDI with a p-value of 0.0369 and HDI granger-causes currency in circulation (CC) with a significantly positive p-value of 0.0163 at the 5% level of significance; we thus document a bi-directional causal relationship between CC and HDI. Also, we observed a positive causal relationship between HDI and Demand deposit with a significant p-value of 0.0100 but on the reverse demand deposit (DD) does not granger-cause HDI since its p-value is greater than the 5% chosen level of significance. Hence, we document a uni-directional causal relationship. Further observations reveal that quasi money (QM) granger-causes HDI with a significantly positive p-value of 0.0132 and HDI granger-causes quasi money (QM) with significant p-value of 0.0309, indicating another bi-directional relationship between this broad money supply component (QM) and economic development effectively proxied by HDI.

4.3.2 Restatement of Hypothesis Two

Ho_1: There is no significant relationship between discount rate mechanisms captured by both monetary policy rate (MPR) and interest rate (INTR), and economic development of Nigeria.

H_{i1}: There is significant relationship between discount rate mechanisms captured by both monetary policy rate (MPR) and interest rate (INTR), and economic development of Nigeria.

4.3.2.1 OLS Regression Test for Short-run Effect

Table 4.12: Regression Result for Discount Rate Mechanisms – Model 2

Dependent Variable: HDI				
Method: Least Squares				
Date: 03/27/18 Time: 08:18				
Sample (adjusted): 1987 2015				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.019423	0.004906	3.959048	0.0006
INTR(1)	0.080566	0.029010	2.777162	0.0107
MPR(1)	-0.083173	0.029153	-2.852966	0.0090
INFR(1)	-0.002392	0.002699	-0.886239	0.3847
HDI(-1)	0.972570	0.008001	121.5585	0.0000
R-squared	0.998981	Mean dependent var		0.413964
Adjusted R-squared	0.998804	S.D. dependent var		0.084515
S.E. of regression	0.002923	Akaike info criterion		-8.672233
Sum squared resid	0.000196	Schwarz criterion		-8.434340
Log likelihood	126.4113	Hannan-Quinn criter.		-8.599507
F-statistic	5638.779	Durbin-Watson stat		2.413037
Prob(F-statistic)	0.000000			

Source: Author's computer generated Eviews result

In table 4.11, the R^2 and Adjusted R^2 both showed 99.89% and 99.88% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is 99.89% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 99.89%. Also, with a high Adjusted R^2 (99.88%) implies that the model can take on more variables conveniently without the R^2 falling beyond 99.88%, which is very commendable. F-statistics of 5638.779 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent

and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant and displays a Durbin-Watson of 2.41304, which is considered good as it shows little or no effect of autocorrelation on the chosen data.

Hence, from table 4.11, the INTR(1) at lead 1, has a t-statistic value of 2.7772 and a p-value of 0.0107, was found to have a positive effect on HDI and this effect is statistically significant at 5% level since its p-value is less than 0.05. Similarly, MPR(1) at lead 1, has a t-statistic value of -2.8530 and a p-value of 0.0090, was however, found to have a negative effect on HDI but this effect is statistically significant at the 5% level of significance. Therefore, we reject the null hypothesis to accept the alternative that discount rate mechanisms captured by interest rates and monetary policy rates have significant effect in the short-run on economic development proxied by HDI. However, the INFR(1) at lead1, has a t-statistic value of -0.8862 and p-value of 0.3847 and this effect is positive and statistically not significant at the 5% level. The INFR is to act as a moderator to the outcome of both the dependent and independent variable. The implication of this result is that a 1% increase in INTR will result to a 8.06% increase in HDI while a 1% rise in MPR will result to a 8.317% increase in HDI and the coefficient of the future levels of INTR and MPR variables have a positive and negative signs respectively at the 5% significance level.

4.3.2.2 Co-integration test For Long-run effect

Table 4.13: ARDL Bounds Tests for Cointegration Model 2 (Appendix B)

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.992798	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Source: Author's Computation Using EViews 10 Software

Given a computed F statistics Value of 7.992798 for HDI equations, the results of the bounds co-integration test therefore establish that the null hypothesis against its alternative is rejected at the various significance level. The computed *F*-statistic for the respective equations are greater than the lower and upper critical bound values at 1%, 2.5%, 5% and 10% respectively, thus indicating the existence of a steady-state long-run relationship among the variables. This suggest that the various selected variables have a long run relationship with human development index in Nigeria.

Decision rule: We reject null hypothesis of the co-integration relationship to accept the alternative that there is Co-integration. We thus, conclude that interest rate and monetary policy rate have a long-run effect on Economic development proxied by HDI (Human Development index).

4.3.2.3 Granger-Causality test For Model 2

Table 4.14: Granger-Causality Result for model 2

Pairwise Granger Causality Tests			
Date: 03/27/18 Time: 09:06			
Sample: 1986 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
MPR does not Granger Cause INTR	26	0.27555	0.7619
INTR does not Granger Cause MPR		3.04931	0.0688
INFR does not Granger Cause INTR	29	0.79249	0.4642
INTR does not Granger Cause INFR		1.90913	0.1701
HDI does not Granger Cause INTR	29	1.63466	0.2160
INTR does not Granger Cause HDI		0.28873	0.7518
INFR does not Granger Cause MPR	26	0.87668	0.4309
MPR does not Granger Cause INFR		4.04120	0.0327
HDI does not Granger Cause MPR	26	1.52524	0.2407
MPR does not Granger Cause HDI		0.66439	0.5251
HDI does not Granger Cause INFR	29	2.35825	0.1161
INFR does not Granger Cause HDI		0.42694	0.6574

Source: Author's E-views computation

The result in table 4.13 shows that MPR does not granger-cause HDI and HDI does not granger-cause MPR as their respective p-values are higher than the chosen level of significance of 5%

being 0.5251 and 0.2407 respectively. Similarly, the INTR does not granger-cause HDI and HDI does not granger-cause INTR because their respective p-values are greater than the chosen level of significance of 5% being 0.7518 and 0.2160 respectively. Hence, we conclude that MPR and INTR, both does not granger-cause economic development proxied by HDI and HDI does not granger-cause monetary policy rate as well as interest rate proxied by MPR and INTR respectively.

4.3.3 Restatement of Hypothesis Three

Ho_1: There is no significant relationship between reserve requirements captured by liquidity ratio (LR), and economic development of Nigeria.

H_{i1}: There is significant relationship between reserve requirements captured by liquidity ratio (LR), and economic development of Nigeria.

4.3.3.1 OLS Regression Test for Short-run Effect

Table 4.15: Regression Result for Reserve Requirements – Model 3

Dependent Variable: HDI				
Method: Least Squares				
Date: 03/27/18 Time: 14:22				
Sample (adjusted): 1988 2013				
Included observations: 25 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009515	0.004635	2.052988	0.0534
LR(3)	0.018581	0.007544	2.463017	0.0230
INFR(-2)	-0.002869	0.003825	-0.749979	0.4620
HDI(-1)	0.982171	0.010145	96.81592	0.0000
R-squared	0.998865	Mean dependent var		0.409520
Adjusted R-squared	0.998638	S.D. dependent var		0.077443
S.E. of regression	0.002858	Akaike info criterion		-8.700455
Sum squared resid	0.000163	Schwarz criterion		-8.456680
Log likelihood	113.7557	Hannan-Quinn criter.		-8.632842
F-statistic	4400.061	Durbin-Watson stat		2.088820
Prob(F-statistic)	0.000000			

Source: Author's computer generated Eviews result

In table 4.15, the R^2 and Adjusted R^2 both showed 99.89% and 99.86% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is

99.89% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 99.89%. Also, with a high Adjusted R^2 (99.86%) implies that the model can take on more variables conveniently without the R^2 falling beyond 99.86%, which is very commendable. F-statistics of 4400.061 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant and displays a Durbin-Watson of 2.0888, which is considered good as it shows little or no effect of autocorrelation on the chosen data.

Hence, from table 4.15, the LR(3) at lead 2, was found to have a t-statistic value of 2.4630 and a p-value of 0.0230, was found to have a positively significant effect on HDI at the 5% level of significance. Therefore, we reject null hypothesis to accept the alternative. However, the INFR (-2) at lag 2, has a t-statistic value of -0.74998 and p-value of 0.4620 and this effect is negative and statistically not significant at the 5% level. The implication of this result is that a 1% rise in liquidity ratio will result to a 1.8581% increase in HDI and the coefficient of the future levels of LR variable has a positive sign and is positive at the 5% significance level.

4.3.2.2 Co-integration test for long-run effect

Table 4.16: ARDL Bounds Tests for Cointegration Model 3 (Appendix C)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	68.40978	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Source: Author's Computation Using EViews 10 Software

The table 4.16 showed computed F statistics Value of 68.40978 for HDI equations, the results of the bounds co-integration test therefore establish that the null hypothesis against its alternative is rejected at the various significance levels. The computed *F*-statistic for the respective equations are greater than the lower and upper critical bound values at 1%, 2.5%, 5% and 10% respectively, thus indicating the existence of a steady-state long-run relationship among the variables. This suggest that the various selected variables in LR and INFR have a long run relationship with human development index in Nigeria.

Decision rule: We reject the null hypothesis of the co-integration relationship to accept the alternative that there is Co-integration. We thus, conclude from the result that Liquidity ratio has long-run effect on Economic development proxied by HDI (Human Development index).

4.3.2.3 Granger-Causality test For Model 3

Table 4.17: Granger-Causality Result for model 3

Pairwise Granger Causality Tests			
Date: 03/27/18 Time: 15:13			
Sample: 1986 2016			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
HDI does not Granger Cause CRR	30	1.16443	0.2901
CRR does not Granger Cause HDI		0.03099	0.8616
INFR does not Granger Cause CRR	30	2.18192	0.1512
CRR does not Granger Cause INFR		0.42863	0.5182
LR does not Granger Cause CRR	28	5.00009	0.0345
CRR does not Granger Cause LR		0.20645	0.6535
INFR does not Granger Cause HDI	30	0.27331	0.6054
HDI does not Granger Cause INFR		2.21981	0.1478
LR does not Granger Cause HDI	28	1.13468	0.2970
HDI does not Granger Cause LR		0.88325	0.3563
LR does not Granger Cause INFR	28	0.19038	0.6663
INFR does not Granger Cause LR		0.12873	0.7228

Source: Author's E-views computation

The result in table 4.17 shows that CRR does not granger-cause HDI and HDI does not granger-cause CRR as their respective p-values are higher than the chosen level of significance of 5%

being 0.8616 and 0.2901 respectively. Similarly, LR does not granger-cause HDI and HDI does not granger-cause LR as p-values is greater than 0.05 being 0.2970 and 0.3563 respectively. Hence, we conclude that CRR and LR does not granger-cause economic development proxied by HDI and HDI does not granger-cause cash reserve ratio and liquidity ratio proxied by CRR and LR respectively.

4.3.4 Restatement of Hypothesis Four

Ho_1: There is no significant relationship between open market operations represented by both the Treasury Bill Rate (TBR) and the Central Bank Treasury Certificate (CBTC), and economic development of Nigeria.

H_{i1}: There is significant relationship between open market operations represented by both the Treasury Bill Rate (TBR) and the Central Bank Treasury Certificate (CBTC), and economic development of Nigeria.

4.3.4.1 OLS Regression Test for Short-run Effect

Table 4.19: Regression Result for Open Market Operations Mechanisms – Model 4

Dependent Variable: HDI				
Method: Least Squares				
Date: 03/27/18 Time: 16:33				
Sample (adjusted): 1988 2016				
Included observations: 29 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018880	0.005964	3.165480	0.0042
CBTC(-2)	-0.017106	0.018484	-0.925430	0.3640
TBR(-1)	0.023679	0.019842	1.193330	0.2444
INFR(-1)	-0.001042	0.003201	-0.325562	0.7476
HDI(-1)	0.974389	0.009514	102.4120	0.0000
R-squared	0.998568	Mean dependent var		0.423690
Adjusted R-squared	0.998330	S.D. dependent var		0.080888
S.E. of regression	0.003306	Akaike info criterion		-8.430660
Sum squared resid	0.000262	Schwarz criterion		-8.194920
Log likelihood	127.2446	Hannan-Quinn criter.		-8.356829
F-statistic	4184.779	Durbin-Watson stat		2.402408
Prob(F-statistic)	0.000000			

Source: Author's computer generated Eviews result

In table 4.19, the R^2 and Adjusted R^2 both showed 99.86% and 99.83% respectively. This shows that the chosen regression model best fits the data. Hence, the goodness of fit regression model is 99.86% and implies that chosen explanatory variables explain variations in the dependent variables to the tune of 99.86%. Also, with a high Adjusted R^2 (99.83%) implies that the model can take on more variables conveniently without the R^2 falling beyond 99.83%, which is very commendable. F-statistics of 4184.779 is considered very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant and displays a Durbin-Watson of 2.4024, which is considered good as it shows little or no effect of autocorrelation on the chosen data.

Hence, from table 4.19, CBCT(-2) at lag 2, has a t-statistic value of -0.9254 and a p-value 0.3640 while TBR(-1) at lag 1, had a t-statistic value of 1.1933 and a p-value of 0.2444, were found to have both negative and positive effect on HDI respectively and these effects were statistically not significant at 5% level since their p-values were greater than 0.05. Therefore, we accept null hypothesis to reject the alternative. Similarly, the INFR, has a t-statistic value of -0.3254 and p-value of 0.7476 and this effect is negative and statistically not significant at the 5% level. The implication of this result is that a 1% increase in CBTC, will result to a 1.7106% decrease in economic development (HDI) while a 1% increase in TBR, will result to a 2.3679% increase in HDI and the coefficients of the past levels of CBTC and TBR variables have both negative and positive sign and at the 5% significance level.

4.3.4.2 Co-integration test for long-run effect

Table 4.20: **Table 1d: ARDL Results for Cointegration Analysis**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.699604	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Source: Author's Computation Using EViews 10 Software

Based on the bound test result in table 4.20, the computed F statistics Value of 4.699604 for HDI equations, the results of the bounds co-integration test therefore establish that the null hypothesis against its alternative is rejected at the various significance levels. The computed *F*-statistic for the respective equations are greater than the lower and upper critical bound values at 1%, 2.5%, 5% and 10% respectively, thus indicating the existence of a steady-state long-run relationship among the variables. This suggest that the various selected variables in CBTC, TBR and INFR have a long run relationship with human development index in Nigeria.

Decision rule: We reject the null hypothesis of the co-integration relationship to accept the alternative that there is Co-integration. We thus, conclude from the result that open market operations have long-run effect on Economic development proxied by HDI (Human Development index).

4.3.4.3 Granger-Causality test For Model 4

Table 4.21: Granger-Causality Result for model 4

Pairwise Granger Causality Tests			
Date: 03/28/18 Time: 06:00			
Sample: 1986 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
HDI does not Granger Cause CBTC	29	2.73576	0.0851
CBTC does not Granger Cause HDI		0.86593	0.4334
INFR does not Granger Cause CBTC	29	1.55241	0.2323
CBTC does not Granger Cause INFR		4.54746	0.0212
TBR does not Granger Cause CBTC	29	3.22189	0.0576
CBTC does not Granger Cause TBR		4.21937	0.0269
INFR does not Granger Cause HDI	29	0.42694	0.6574
HDI does not Granger Cause INFR		2.35825	0.1161
TBR does not Granger Cause HDI	29	0.60733	0.5530
HDI does not Granger Cause TBR		4.37404	0.0240
TBR does not Granger Cause INFR	29	1.71301	0.2016
INFR does not Granger Cause TBR		2.31263	0.1207

Source: Author's E-views computation

The result in table 4.21 shows that CBTC does not granger-cause HDI and similarly, HDI does not granger-cause CBTC, both showing a p-values of 0.4334 and 0.0851 respectively. Also, TBR does not granger-cause HDI but HDI granger-causes TBR, their respective p-values being 0.5530 and 0.0240 compared to the chosen level of significance. Hence, we conclude that TBR does not granger-cause economic development proxied by HDI but economic development granger-causes Treasury bill rate proxy by TBR.

4.4. Discussion of Findings

This study examined the Effect of Monetary Policy instruments on Economic Development of Nigeria from 1986 to 2016 with a view to affirming or refuting the propositions of erudite scholars on the Effects of Monetary Policy Instruments on Economic Development of Nigeria. Following a detail theoretical review and empirical analyses, findings were made in line with the research questions as well as set and tested hypotheses. The study employed four models and used diagnostics tests namely – Unit root test, multicollinearity, Ramsey reset, Heteroskedasticity, Breseuch Godfrey serial correlation, and

Correlation; regression tests, Cointegration tests, causality test and Error Correction testing techniques to test and analyse the data represented in table 4.1 to 4.22b. The findings are hereby discussed below in line with the objectives of this study.

Objective One

To determine the effect of Broad Money supply represented by Currency in Circulation, Demand deposits and Quasi money on economic development of Nigeria.

The result of the data regression analysis showed that broad money supply represented by currency in circulation (CC), Demand deposit (DD), and Quasi money (QM), all have a positive and insignificant effect on economic development of Nigeria. The study showed that future levels of these broad money supply components have a positive (t-statistic; 1.2496, 0.7346, 0.8225 respectively) and insignificant effect (p-value;0.2246, 0.4703, 0.4196 respectively) on economic development (HDI) at the 5% level of significance. The coefficients of the future levels of currency in circulation, demand deposit and quasi money have a positive sign (0.07935, 0.04935 and 0.05200 respectively) at the chosen level of significance. This implies that a 1% increase in future levels of CC for instance, will result to a 7.935% rise in economic development, 1% rise in future levels of DD will result to 4.9% rise in economic development while a 1% rise in future levels of QM will result to a 5.200% growth in economic development. The result of this study is consistent with the findings of Mohammed and Ahmed (1995) and Dotimi (2009), who also found a positive and insignificant effect of broad money supply on economic growth. This outcome is however at variance with the theoretical foundation of the monetarist theory and our apriori expectation of a positive and significant effect. However, the Granger-causality tests reveal a positive and significant Bi-directional relationship effect between HDI and currency in circulation (p-value of 0.0163 and 0.0369 respectively); a positive and significant Uni-directional relationship effect of HDI on DD (p-value- 0.0100) while the tests further show a positive and

significant Bi-directional relationship effect between QM and HDI (p-value- 0.0309 and 0.0132). A plausible direct interpretation of this result is that the governments' policies on broad money supply components in Nigeria are not sound enough and effective in regulating the money in circulation. We advise that necessary policy adjustments be made to ensure significant effects in broad money supply component policies of government. The diagnostic tests revealed that the variables were stationery at first difference and there were strong evidence of cointegration between the variables with the speed of adjustments to long-run convergences being highly significant at 92.06%. This findings are also in line with the outcome of Olubosoye and Oyaromade (2008) on negative and significant long-run effect between economic growth and monetary policy instruments.

Objective Two

To ascertain the extent to which discount rate mechanisms represented by interest rate and monetary policy rate affects economic development of Nigeria.

The result of the ordinary regression analysis showed that interest rate and monetary policy rate have a positive and negative but significant effect respectively on economic development of Nigeria. The study showed that future levels of interest rate and monetary policy rate(t-statistic, 2.7772 and -2.8530 respectively) and significant effect (p-value of 0.0107 and 0.0090 respectively) on economic development (HDI) at the 5% level of significance. The coefficients of the future levels of interest rate (INTR, 1) monetary policy rate (MPR, 1) have positive sign (0.0806) and negative sign(-0.08317) at the chosen level of significance. This implies that a 1% increase in future levels of INTR will result to 8.06% rise in economic development while 1% increase in future levels of MPR will result to a8.317% decline in economic development.

The result of this study is corroborated by the findings of Onyeiwu (2012) and Eregha (2010), whose studies found positive and negative significant effects of monetary policy instrument on economic growth respectively. The granger-causality test however did not reveal any relationship effect between HDI and INTR and MPR. The monetarist theory strongly supports these findings as it propounds that the effect of increase in monetary policy instruments must be direct and proportionate. Also, in the Cointegration test, the effect again is positive and highly significant and is in line with findings of Chimaobi and Uche (2010) of a positive and significant cointegration effect. However, the error correction term stands at a speed of adjustment of 73.10% to long-run convergence with a negative sign that is highly significant.

Objective Three

To critically examine the effect of reserve requirements captured by liquidity ratio on economic development of Nigeria:

The outcome of our work on this objective showed a regression result of a positive and significant (p-value= 0.0230) effect of liquidity ratio on economic development of Nigeria in the short-run period while the long-run (co-integration) also test revealed a positive and significant effect on economic development. The position is supported by the work of Onyeiwu (2012) and Dotimi (2009) who found a significant short-run relationship but however showed an insignificant long-run relationship respectively between monetary policy instruments (LR) and economic growth. The granger causality however showed an insignificant result between HDI and LR. The coefficient of the future levels of LR has a positive sign (0.01858) at the 5% level of significance. This result indicates that the coefficients of the future levels of LR(3) has a positive sign and impressive effect on level of economic development at the 5% level of significance. This implies that a 1% increase in future levels of LR will result to a 1.858% increase in economic development. While, the theoretical basis for this outcome agrees with LR result of the monetarist theory in the short-run and also agrees with it in the long-run.

Objective Four

To evaluate the rate at which Open market operation mechanisms measured by Central Bank treasury certificate rates and Treasury bill rates affects the economic development of Nigeria:

The findings of this work shows that treasury bill rates (TBR) has a positive but not significant effect on economic development (p-value = 0.2444) with a t-statistic of 1.19333 at the 5% chosen level of significance. Similarly, Central Bank treasury certificate has a negative and insignificant effect on economic development (p-value= 0.3640) with a t-statistic of 0.9254 at same level of significance. The co-integration tests however, revealed a positive and statistically significant effect of treasury bill rateand Central Bank treasury certificate on economic development. While the findings of the short-run, OLS test is corroborated with the findings of Mohammed and Ahmed (1995); Saibu and Nwosa (2011) and Dotimi (2009), who found no significant relationship between the monetary policy instruments and economic growth. The coefficient of TBR of 0.023679 is positive and indicates that 1% increase in TBR willresult to 2.3679% rise in economic development of Nigeria. Similarly, the coefficient of CBTC of -0.017106 is negative and indicates that a 1% rise in CBTC will result to a 1.7106% decline in economic development of Nigeria. Also, the co-integration result of positive and significant effect of TBR is consistent with the outcome of the research work in Chimaobi and Uche (2010) and Sanchita and Rina (2011), who discovered a positive and significant effect of monetary policy instruments on economic growth. The granger-causality test only showed a significant uni-directional relationship between HDI and TBR (p-value= 0.0240). The speed of adjustment is also impressive from short-run to long-run at 85.52% for the Error correction term with a significant value of 0.0471, and agrees with the findings of Olubusoye and Oyaromade (2008) and Bongunjoko (1997), who discovered a significant speed of adjustment for monetary policy instruments on economic growth using Error correction term. The monetarist theory will however, hold true for the long-run relationship on

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The findings from the specific objectives of this study are as follows:

1. That broad money supply components measured by currency in circulation, demand deposits and quasi money, had positive and insignificant effect on economic development of Nigeria in the short-run but positive and significant effect in the long-run periods.
2. That discount rate mechanism represented by interest rate and monetary policy rate both had significant effect in the short-run period on economic development while they had positive and significant effect on economic development of Nigeria in the long-run period.
3. That reserve requirements captured by liquidity ratio had positive and significant effect on economic development of Nigeria in the short-run and long run period.
4. That Open market operation mechanisms represented by Central Bank treasury certificate rate and Treasury bill rate both had no significant effect on economic development in the short-run but had positive and significant effect in the long-run period on economic development.

5.2 Conclusion

This research work studied the effects of monetary policy instruments on the economic development of Nigeria following largely from the work as postulated by Friedman and the monetarist theorythat 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. They largely held that the economy grows with proper and appropriate monetary policies. Arguments in favour of the monetary policy and economic developments and contradictions to the postulations were reviewed from theoretical and empirical literature. Even lines of argument which suggests that economic growth depends on direction and appropriateness of

monetary policies within our country of study, were also reviewed. Empirical analysis unbundled monetary policy instruments into broad money supply and further disaggregated into currency in circulation, demand deposit and quasi money; Discount rate mechanism, which was further broken into –Interest rate and monetary policy rate; Reserve requirements divided into –liquidity ratio and cash reserve ratio; and lastly, Open market operation mechanisms broken into –Central Bank treasury rate and treasury bill rate. The apparent volatility in the macroeconomic environment over the years undoubtedly cast doubt on the reality of the theoretical basis of the study.

The need to domesticate the study of this nature to our country, contribute to current literature on subject, validate other scholars view point, introduce other variable such as economic development, which to the best of researcher's knowledge had not been included in a country study like Nigeria motivated this study.

It was against the foregoing that the study chose a broad objective of examining the Effect of monetary policy instruments on the economic development of Nigeria.

The results emanating from our study proved that broad money supply components such as currency in circulation, demand deposits and quasi money had positive and insignificant effect on economic development of Nigeria in the short-run while the effect was positive and significant in the long-run period. While in the short-run, discount rate mechanisms represented by interest rate and monetary policy rate showed significant effect on economic development, reserve requirements captured by liquidity ratio and cash reserve ratio, showed a positively significant effect of the liquidity ratio only on economic development while, the open market operation mechanism measured by the Central Bank treasury certificate and the treasury bill rate had no significant effect on economic development of Nigeria; it was however, observed that all the monetary policy instruments studied had positive and significant effect on economic development in the long-run period. In conclusion, based on the outcome

of our Study, we affirm that monetary policy instruments here studied, had significant effect on economic development of Nigeria.

5.3 Recommendations

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

1. Monetary policies should be used to create a favourable investment climate by ensuring the availability of optimum level of money supply in the economy for development and consumption purposes. A framework should be developed to regulate stock of money in circulation at all times, thereby curbing inflation; ensure adequate demand deposits in the financial system, thereby preventing distress of the financial system; Adequate development and availability of financial and near financial instruments within the system, thereby ensuring development and stability of our financial system. CBN should minimize the issuances of emergency policies that are usually short lived as effective policies require ample time for effectiveness and consolidation.
2. Monetary policy rates as well as interest rates should be environment and Business-friendly and predictable in line with prevailing economic dictates and conditions. Relevant stakeholders should be consulted in arriving at appropriate monetary policy and interest rates and as much as feasible government fiat should be reduced in arriving at monetary rates.
3. The financial system should not be starved of necessary funds for lending and credit creation through mandatory liquidity and cash reserve ratios in order to stimulate economic activities and development. The fixing of the liquidity ratio should follow predictable patterns, to enable the banking public and businesses thrive efficiently.

4. There should be greater awareness on the importance of Open market operations and the economic benefits of available market instruments such as Treasury bills and treasury certificates. Attractive rates should be offered in the open market to encourage development of the treasury bills and certificates markets. Furthermore, more monetary instruments should be introduced into the open market to ginger economic development.

5.3.1 Contributions to Knowledge

The study empirically proves that monetary policy instruments have significant effect on economic development of Nigeria which validates the objective of this study.

1. This work contributes to current literature on subject by extending number of years used by other scholars from 20 years to 30 years (1986 – 2016).
2. This work further validates the findings of some Erudite researchers such as Onyeiwu (2012), Anosike (2009) that monetary policy instrument significantly affects economic development of Nigeria.
3. Most reviewed literature studied economic growth but this work studied economic development.

5.3.2 Recommendations for Further Studies

As this work does not claim to be exhaustive, this study recommends the following for further studies:

1. The Effect of monetary policy instruments on economic development of the sub-saharan African countries using Autoregressive Distributed lag model (ARDL)
2. Secondly, this research work recommends for further studies the use of Generalized Autoregressive Conditional Heteroscedasticity Model (GARCH) to study monetary policy impact on economic development.

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APPENDICES

1. Trends of Inflation Rate and Monetary Growth Rate in Nigeria 1980 - 2013

Year	Inflation Rate	Money Growth Rate
1980	10	48
1981	20.6	7
1982	7.7	12
1983	23.2	15.4
1984	39.6	11.9
1985	5.5	12.4
1986	5.4	4.2
1987	10.2	23
1988	34.5	35
1989	50.5	3.5
1990	7.4	45.9
1991	12.7	27.4
1992	44.8	47.5
1993	57.2	53.8
1994	57	34.5
1995	72	19.4
1996	29.3	16.2
1997	8.5	16
1998	10	22.3
1999	6.6	33.1
2000	6.9	48.1
2001	18	27
2002	13.7	21.6
2003	14	24.1
2004	15	14
2005	17.8	24.4
2006	8.3	43.1
2007	5.5	44.2
2008	8.6	47.2
2009	12.4	17.5
2010	13.7	18.2
2011	10.8	15.4
2012	12.2	16.3
2013	11.6	18.4
2014	8.0	14.52
2015	9.55	15.22
2016	18.55	10.98

Source: CBN Annual Reports (Various Issues)

2. Trends of Macroeconomic Indicators in Nigeria:

YEAR	M2	MPR	CRR	TBR	HDI	INFR
1986	0.0423	0.0850	0.017	0.1000	0.258	0.1367
1987	0.2292	0.1175	0.014	0.1275	0.269	0.0969
1988	0.3499	0.1175	0.021	0.1275	0.280	0.6121
1989	0,0354	0.1750	0.029	0.1875	0.291	0.4467
1990	0.4592	0.1750	0.029	0.1850	0.302	0.0361
1991	0.2743	0.1500	0.029	0.1450	0.313	0.2296
1992	0.4753	0.2100	0.044	0.1750	0.324	0.4880
1993	0.5376	0.2690	0.060	0.2600	0.335	0.6126
1994	0.3450	0.1250	0.057	0.1350	0.346	0.7676
1995	0.1941	0.1250	0.058	0.1350	0.351	0.5159
1996	0.1618	0.1225	0.075	0.1350	0.368	0.1431
1997	0,1604	0.1200	0.078	0.1350	0.379	0.1021
1998	0.2232	0.1295	0.083	0.1431	0.390	0.1191
1999	0.3312	0.1700	0.117	0.1800	0.401	0.2200
2000	0.4807	0.1200	0.098	0.1350	0.412	0.1453
2001	0,2700	0.1295	0.108	0.1431	0.423	0.1649
2002	0.2155	0.1888	0.108	0.1900	0.434	0.1297
2003	0.2411	0,1502	0.100	0.1575	0.445	0.2381
2004	0.1402	0.1425	0.086	0.1500	0.463	0.1001
2005	0.2435	0.0700	0.097	0.1300	0.466	0.1157
2006	0.4309	0.1485	0.042	0.1225	0.477	0.0855
2007	0.4480	0.0691	0.028	0.0875	0.481	0.0656
2008	0.5788	0.0955	0.030	0.0981	0.487	0.1506
2009	0.1721	0.060	0.013	0.0744	0.492	0.1220
2010	0.0679	0.0650	0.010	0.0749	0.500	0.1370
2011	0.1299	0.120	0.100	0.1485	0.509	0.1080
2012	0.2060	0.120	0.120	0.1117	0.514	0.1220
2013	0.0966	0.120	0.120	0.1081	0.521	0.8500
2014	0.0444	0.130	0.200	0.1120	0.525	0.0800
2015	0.0300	0.110	0.200	0.0412	0.527	0.0900
2016	0.1155	0.140	0.225	0.1305	0.531	0.1570

Source: CBN, NBS and UNDP (2017)

3. Test for Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	0.427802	Prob. F(2,6)		0.6704
Obs*R-squared	2.371267	Prob. Chi-Square(2)		0.3056
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 03/26/18 Time: 09:28				
Sample: 1991 2011				
Included observations: 19				
Presample and interior missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039750	0.107564	-0.369548	0.7244
CC(-5)	-0.017685	0.120207	-0.147120	0.8879
DD(5)	0.038379	0.133959	0.286497	0.7841
QM(5)	0.038004	0.104534	0.363559	0.7287
MPR(5)	0.042281	0.197268	0.214335	0.8374

INTR(5)	0.048212	0.198836	0.242471	0.8165
CRR(5)	-0.048062	0.113519	-0.423379	0.6868
LR(5)	0.008808	0.060708	0.145086	0.8894
TBR(5)	-0.050005	0.419451	-0.119216	0.9090
CBTC(5)	0.060757	0.353873	0.171691	0.8693
INFR(3)	0.004621	0.023132	0.199776	0.8483
RESID(-1)	-0.532955	0.518873	-1.027138	0.3440
RESID(-2)	-0.275260	0.491208	-0.560374	0.5955
R-squared	0.124804	Mean dependent var		-9.07E-17
Adjusted R-squared	-1.625589	S.D. dependent var		0.007100
S.E. of regression	0.011505	Akaike info criterion		-5.876317
Sum squared resid	0.000794	Schwarz criterion		-5.230121
Log likelihood	68.82501	Hannan-Quinn criter.		-5.766955
F-statistic	0.071300	Durbin-Watson stat		1.897436
Prob(F-statistic)	0.999916			

Source: Author's E-views computation

4. Test For Heteroskedasticity

Heteroskedasticity Test: ARCH				
F-statistic	0.699348	Prob. F(1,19)		0.4134
Obs*R-squared	0.745523	Prob. Chi-Square(1)		0.3879
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 03/26/18 Time: 09:43				
Sample (adjusted): 1987 2011				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000105	2.53E-05	4.154961	0.0005
RESID^2(-1)	-0.045982	0.054985	-0.836271	0.4134
R-squared	0.035501	Mean dependent var		9.64E-05
Adjusted R-squared	-0.015262	S.D. dependent var		0.000105
S.E. of regression	0.000106	Akaike info criterion		-15.37991
Sum squared resid	2.13E-07	Schwarz criterion		-15.28043
Log likelihood	163.4891	Hannan-Quinn criter.		-15.35832
F-statistic	0.699348	Durbin-Watson stat		1.904703
Prob(F-statistic)	0.413397			

Source: Author's E-views computation

5. RAMSEY RESET SPECIFICATION TEST

Ramsey RESET Test				
Equation: UNTITLED				
Specification: HDI C CC(5) DD(5) QM(5) MPR(5) INTR(5) CRR(5) LR(5)				
TBR(5) CBTC(5) INFR(3)				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	0.030749	12	0.9760	
F-statistic	0.000946	(1, 12)	0.9760	
Likelihood ratio	0.001891	1	0.9653	
F-test summary:				
	Sum of Sq.	df	Mean Squares	
Test SSR	3.35E-07	1	3.35E-07	

Restricted SSR	0.004252	13	0.000327	
Unrestricted SSR	0.004252	12	0.000354	
Unrestricted SSR	0.004252	12	0.000354	
LR test summary:				
	Value	df		
Restricted LogL	69.60570	13		
Unrestricted LogL	69.60664	12		
Unrestricted Test Equation:				
Dependent Variable: HDI				
Method: Least Squares				
Date: 03/26/18 Time: 09:51				
Sample: 1986 2011				
Included observations: 24				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.291499	0.495602	0.588172	0.5673
CC(5)	-0.376841	0.602884	-0.625064	0.5436
DD(5)	0.461144	0.663248	0.695282	0.5001
QM(5)	0.146615	0.517721	0.283192	0.7819
MPR(5)	-0.164781	0.336406	-0.489826	0.6331
INTR(5)	0.008159	0.259117	0.031488	0.9754
CRR(5)	0.390475	0.439652	0.888145	0.3919
LR(5)	-0.078079	0.138910	-0.562084	0.5844
TBR(5)	0.698846	0.787518	0.887403	0.3923
CBTC(5)	-0.865870	0.849821	-1.018886	0.3284
INFR(3)	-0.036320	0.045160	-0.804250	0.4369
FITTED^2	-0.043793	1.424187	-0.030749	0.9760
R-squared	0.972699	Mean dependent var		0.390042
Adjusted R-squared	0.947672	S.D. dependent var		0.082288
S.E. of regression	0.018824	Akaike info criterion		-4.800554
Sum squared resid	0.004252	Schwarz criterion		-4.211527
Log likelihood	69.60664	Hannan-Quinn criter.		-4.644285
F-statistic	38.86702	Durbin-Watson stat		1.561150
Prob(F-statistic)	0.000000			

Source: Author's E-views computation

7. Residual Unit Root Test for model I

Null Hypothesis: ECT 1 has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=5)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.016212	0.0000
Test critical values:	1% level		-3.724070	
	5% level		-2.986225	
	10% level		-2.632604	
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT1)				
Method: Least Squares				
Date: 03/27/18 Time: 06:33				
Sample (adjusted): 1990 2014				
Included observations: 25 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT 1(-1)	-1.241803	0.206410	-6.016212	0.0000
C	6.57E-05	0.000578	0.113636	0.9105
R-squared	0.611452	Mean dependent var		-9.63E-05

Adjusted R-squared	0.594559	S.D. dependent var		0.004534
S.E. of regression	0.002887	Akaike info criterion		-8.780504
Sum squared resid	0.000192	Schwarz criterion		-8.682994
Log likelihood	111.7563	Hannan-Quinn criter.		-8.753459
F-statistic	36.19480	Durbin-Watson stat		1.887533
Prob(F-statistic)	0.000004			

Source: Author's E-views computation

8. Residual Unit Root Test for model 2

Null Hypothesis: ECT2 has a unit root				
Exogenous: Constant				
Lag Length: 3 (Automatic - based on SIC, maxlag=6)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.686016	0.0017
Test critical values:	1% level		-3.831511	
	5% level		-3.029970	
	10% level		-2.655194	
*MacKinnon (1996) one-sided p-values.				
Warning: Probabilities and critical values calculated for 20 observations				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT2)				
Method: Least Squares				
Date: 03/27/18 Time: 11:26				
Sample (adjusted): 1992 2015				
Included observations: 19 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT2(-1)	-2.955025	0.630605	-4.686016	0.0004
D(ECT2(-1))	1.372082	0.509500	2.692999	0.0175
D(ECT2(-2))	0.996349	0.362415	2.749197	0.0157
D(ECT2(-3))	0.559655	0.221171	2.530413	0.0240
C	0.000554	0.000586	0.945679	0.3603
R-squared	0.779475	Mean dependent var		-9.96E-05
Adjusted R-squared	0.716468	S.D. dependent var		0.004582
S.E. of regression	0.002440	Akaike info criterion		-8.973066
Sum squared resid	8.33E-05	Schwarz criterion		-8.724529
Log likelihood	90.24413	Hannan-Quinn criter.		-8.931004
F-statistic	12.37124	Durbin-Watson stat		2.051113
Prob(F-statistic)	0.000164			

Source: Author's E-views computation

12. Residual Unit Root Test for Model 3

Null Hypothesis: ECT3 has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=5)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.919549	0.0007
Test critical values:	1% level		-3.752946	
	5% level		-2.998064	
	10% level		-2.638752	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT3)				
Method: Least Squares				
Date: 03/27/18 Time: 15:34				
Sample (adjusted): 1989 2013				
Included observations: 23 after adjustments				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT3(-1)	-1.302931	0.264848	-4.919549	0.0001
C	-0.000163	0.000568	-0.286512	0.7773
R-squared	0.535418	Mean dependent var		0.000331
Adjusted R-squared	0.513295	S.D. dependent var		0.003844
S.E. of regression	0.002682	Akaike info criterion		-8.921745
Sum squared resid	0.000151	Schwarz criterion		-8.823006
Log likelihood	104.6001	Hannan-Quinn criter.		-8.896912
F-statistic	24.20196	Durbin-Watson stat		1.434826
Prob(F-statistic)	0.000072			

Source: Author's E-views computation

13. Residual Unit Root Test For model 4

Null Hypothesis: ECT4 has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=6)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.399543	0.0000
Test critical values:	1% level		-3.689194	
	5% level		-2.971853	
	10% level		-2.625121	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT4)				
Method: Least Squares				
Date: 03/28/18 Time: 06:13				
Sample (adjusted): 1989 2016				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT4(-1)	-1.212511	0.189468	-6.399543	0.0000
C	8.78E-05	0.000580	0.151390	0.8808
R-squared	0.611675	Mean dependent var		6.97E-05
Adjusted R-squared	0.596739	S.D. dependent var		0.004830
S.E. of regression	0.003067	Akaike info criterion		-8.667196
Sum squared resid	0.000245	Schwarz criterion		-8.572038
Log likelihood	123.3407	Hannan-Quinn criter.		-8.638105
F-statistic	40.95416	Durbin-Watson stat		1.906241
Prob(F-statistic)	0.000001			

Source: Author's E-views computation

Appendix A: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model I)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 0, 1, 0)				
Case 3: Unrestricted Constant and No Trend				
Date: 08/27/18 Time: 14:41				
Sample: 1986 2016				
Included observations: 30				
Conditional Error Correction Regression				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.043790	0.061578	-0.711126	0.4842
HDI(-1)*	-0.026362	0.012556	-2.099554	0.0469
CC**	0.064582	0.061107	1.056871	0.3015
DD**	0.085580	0.063987	1.337455	0.1942
QM(-1)	0.046131	0.061367	0.751718	0.4598
INFR**	6.74E-05	0.002821	0.023876	0.9812
D(QM)	0.076006	0.060717	1.251813	0.2232

* p-value incompatible with t-Bounds distribution.

** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CC	2.449846	2.735490	0.895579	0.3798
DD	3.246379	2.690257	1.206717	0.2398
QM	1.749917	2.505227	0.698507	0.4919
INFR	0.002555	0.106980	0.023885	0.9812

EC = HDI - (2.4498*CC + 3.2464*DD + 1.7499*QM + 0.0026*INFR)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.092733	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
Actual Sample Size	30		Finite Sample: n=30	
		10%	2.752	3.994
		5%	3.354	4.774
		1%	4.768	6.67

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-2.099554	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

Appendix B: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model II)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 1, 0)				
Case 3: Unrestricted Constant and No Trend				
Date: 08/27/18 Time: 14:54				
Sample: 1986 2016				
Included observations: 30				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018361	0.004143	4.432444	0.0002
HDI(-1)*	-0.026560	0.006743	-3.938779	0.0006
INTR**	0.010206	0.013220	0.771980	0.4477
MPR(-1)	8.46E-06	2.68E-06	3.158563	0.0042
INFR**	-0.001644	0.002434	-0.675529	0.5058
D(MPR)	1.88E-06	1.84E-06	1.021610	0.3172
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR	0.384264	0.544574	0.705622	0.4872
MPR	0.000319	0.000121	2.634476	0.0145
INFR	-0.061905	0.089381	-0.692599	0.4952
EC = HDI - (0.3843*INTR + 0.0003*MPR -0.0619*INFR)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.992798	10%	2.72	3.77
k	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	30		Finite Sample: n=30	
		10%	3.008	4.15
		5%	3.71	5.018
		1%	5.333	7.063

t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-3.938779	10%	-2.57	-3.46
		5%	-2.86	-3.78
		2.5%	-3.13	-4.05
		1%	-3.43	-4.37

Appendix C: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model III)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 0)				
Case 2: Restricted Constant and No Trend				
Date: 08/27/18 Time: 14:59				
Sample: 1986 2016				
Included observations: 29				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012547	0.005129	2.446525	0.0218
HDI(-1)*	-0.023827	0.007319	-3.255591	0.0032
LR**	0.014690	0.007141	2.057275	0.0502
INFR**	-0.000461	0.002867	-0.160851	0.8735
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	0.616531	0.386266	1.596130	0.1230
INFR	-0.019357	0.118254	-0.163691	0.8713
C	0.526597	0.140181	3.756557	0.0009
EC = HDI - (0.6165*LR -0.0194*INFR + 0.5266)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	68.40978	10%	2.63	3.35

k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	29		Finite Sample: n=35	
		10%	2.845	3.623
		5%	3.478	4.335
		1%	4.948	6.028
			Finite Sample: n=30	
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Appendix D: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model IV)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 0, 0)				
Case 3: Unrestricted Constant and No Trend				
Date: 08/27/18 Time: 15:02				
Sample: 1986 2016				
Included observations: 30				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013355	0.005230	2.553284	0.0172
HDI(-1)*	-0.019871	0.008480	-2.343117	0.0274
CBTC**	-0.023396	0.033454	-0.699358	0.4908
TBR**	0.054173	0.036837	1.470610	0.1539
INFR**	-0.002126	0.002896	-0.734300	0.4696
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBTC	-1.177428	1.704288	-0.690862	0.4960
TBR	2.726278	2.330155	1.169998	0.2530
INFR	-0.107014	0.144075	-0.742767	0.4645
EC = HDI - (-1.1774*CBTC + 2.7263*TBR -0.1070*INFR)				
F-Bounds Test		Null Hypothesis: No levels relationship		

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.699604	10%	2.72	3.77
k	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	30		Finite Sample: n=30	
		10%	3.008	4.15
		5%	3.71	5.018
		1%	5.333	7.063
t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-2.343117	10%	-2.57	-3.46
		5%	-2.86	-3.78
		2.5%	-3.13	-4.05
		1%	-3.43	-4.37

APPENDICES

6. Trends of Inflation Rate and Monetary Growth Rate in Nigeria 1980 - 2013

Year	Inflation Rate	Money Growth Rate
1980	10	48
1981	20.6	7
1982	7.7	12
1983	23.2	15.4
1984	39.6	11.9
1985	5.5	12.4
1986	5.4	4.2
1987	10.2	23
1988	34.5	35
1989	50.5	3.5
1990	7.4	45.9
1991	12.7	27.4
1992	44.8	47.5
1993	57.2	53.8
1994	57	34.5
1995	72	19.4
1996	29.3	16.2
1997	8.5	16
1998	10	22.3
1999	6.6	33.1
2000	6.9	48.1
2001	18	27

2002	13.7	21.6
2003	14	24.1
2004	15	14
2005	17.8	24.4
2006	8.3	43.1
2007	5.5	44.2
2008	8.6	47.2
2009	12.4	17.5
2010	13.7	18.2
2011	10.8	15.4
2012	12.2	16.3
2013	11.6	18.4
2014	8.0	14.52
2015	9.55	15.22
2016	18.55	10.98

Source: CBN Annual Reports (Various Issues)

7. Trends of Macroeconomic Indicators in Nigeria:

YEAR	M2	MPR	CRR	TBR	HDI	INFR
1986	0.0423	0.0850	0.017	0.1000	0.258	0.1367
1987	0.2292	0.1175	0.014	0.1275	0.269	0.0969
1988	0.3499	0.1175	0.021	0.1275	0.280	0.6121
1989	0,0354	0.1750	0.029	0.1875	0.291	0.4467
1990	0.4592	0.1750	0.029	0.1850	0.302	0.0361
1991	0.2743	0.1500	0.029	0.1450	0.313	0.2296
1992	0.4753	0.2100	0.044	0.1750	0.324	0.4880
1993	0.5376	0.2690	0.060	0.2600	0.335	0.6126
1994	0.3450	0.1250	0.057	0.1350	0.346	0.7676
1995	0.1941	0.1250	0.058	0.1350	0.351	0.5159
1996	0.1618	0.1225	0.075	0.1350	0.368	0.1431
1997	0,1604	0.1200	0.078	0.1350	0.379	0.1021
1998	0.2232	0.1295	0.083	0.1431	0.390	0.1191
1999	0.3312	0.1700	0.117	0.1800	0.401	0.2200
2000	0.4807	0.1200	0.098	0.1350	0.412	0.1453
2001	0,2700	0.1295	0.108	0.1431	0.423	0.1649
2002	0.2155	0.1888	0.108	0.1900	0.434	0.1297
2003	0.2411	0,1502	0.100	0.1575	0.445	0.2381
2004	0.1402	0.1425	0.086	0.1500	0.463	0.1001
2005	0.2435	0.0700	0.097	0.1300	0.466	0.1157
2006	0.4309	0.1485	0.042	0.1225	0.477	0.0855
2007	0.4480	0.0691	0.028	0.0875	0.481	0.0656
2008	0.5788	0.0955	0.030	0.0981	0.487	0.1506
2009	0.1721	0.060	0.013	0.0744	0.492	0.1220
2010	0.0679	0.0650	0.010	0.0749	0.500	0.1370
2011	0.1299	0.120	0.100	0.1485	0.509	0.1080
2012	0.2060	0.120	0.120	0.1117	0.514	0.1220
2013	0.0966	0.120	0.120	0.1081	0.521	0.8500
2014	0.0444	0.130	0.200	0.1120	0.525	0.0800
2015	0.0300	0.110	0.200	0.0412	0.527	0.0900
**2016	0.1155	0.140	0.225	0.1305	0.531	0.1570

Source: CBN, NBS and UNDP (2017)

8. Test for Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	0.427802	Prob. F(2,6)		0.6704
Obs*R-squared	2.371267	Prob. Chi-Square(2)		0.3056
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 03/26/18 Time: 09:28				
Sample: 1991 2011				
Included observations: 19				
Presample and interior missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039750	0.107564	-0.369548	0.7244
CC(-5)	-0.017685	0.120207	-0.147120	0.8879
DD(5)	0.038379	0.133959	0.286497	0.7841
QM(5)	0.038004	0.104534	0.363559	0.7287
MPR(5)	0.042281	0.197268	0.214335	0.8374
INTR(5)	0.048212	0.198836	0.242471	0.8165
CRR(5)	-0.048062	0.113519	-0.423379	0.6868
LR(5)	0.008808	0.060708	0.145086	0.8894
TBR(5)	-0.050005	0.419451	-0.119216	0.9090
CBTC(5)	0.060757	0.353873	0.171691	0.8693
INFR(3)	0.004621	0.023132	0.199776	0.8483
RESID(-1)	-0.532955	0.518873	-1.027138	0.3440
RESID(-2)	-0.275260	0.491208	-0.560374	0.5955
R-squared	0.124804	Mean dependent var		-9.07E-17
Adjusted R-squared	-1.625589	S.D. dependent var		0.007100
S.E. of regression	0.011505	Akaike info criterion		-5.876317
Sum squared resid	0.000794	Schwarz criterion		-5.230121
Log likelihood	68.82501	Hannan-Quinn criter.		-5.766955
F-statistic	0.071300	Durbin-Watson stat		1.897436
Prob(F-statistic)	0.999916			

Source: Author's E-views computation

9. Test For Heteroskedasticity

Heteroskedasticity Test: ARCH				
F-statistic	0.699348	Prob. F(1,19)		0.4134
Obs*R-squared	0.745523	Prob. Chi-Square(1)		0.3879
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 03/26/18 Time: 09:43				
Sample (adjusted): 1987 2011				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000105	2.53E-05	4.154961	0.0005
RESID^2(-1)	-0.045982	0.054985	-0.836271	0.4134
R-squared	0.035501	Mean dependent var		9.64E-05
Adjusted R-squared	-0.015262	S.D. dependent var		0.000105
S.E. of regression	0.000106	Akaike info criterion		-15.37991
Sum squared resid	2.13E-07	Schwarz criterion		-15.28043
Log likelihood	163.4891	Hannan-Quinn criter.		-15.35832
F-statistic	0.699348	Durbin-Watson stat		1.904703
Prob(F-statistic)	0.413397			

Source: Author's E-views computation

10. RAMSEY RESET SPECIFICATION TEST

Ramsey RESET Test				
Equation: UNTITLED				
Specification: HDI C CC(5) DD(5) QM(5) MPR(5) INTR(5) CRR(5) LR(5)				
TBR(5) CBTC(5) INFR(3)				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	0.030749	12	0.9760	
F-statistic	0.000946	(1, 12)	0.9760	
Likelihood ratio	0.001891	1	0.9653	
F-test summary:				
	Sum of Sq.	df	Mean Squares	
Test SSR	3.35E-07	1	3.35E-07	
Restricted SSR	0.004252	13	0.000327	
Unrestricted SSR	0.004252	12	0.000354	
Unrestricted SSR	0.004252	12	0.000354	
LR test summary:				
	Value	df		
Restricted LogL	69.60570	13		
Unrestricted LogL	69.60664	12		
Unrestricted Test Equation:				
Dependent Variable: HDI				
Method: Least Squares				
Date: 03/26/18 Time: 09:51				
Sample: 1986 2011				
Included observations: 24				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.291499	0.495602	0.588172	0.5673
CC(5)	-0.376841	0.602884	-0.625064	0.5436
DD(5)	0.461144	0.663248	0.695282	0.5001
QM(5)	0.146615	0.517721	0.283192	0.7819
MPR(5)	-0.164781	0.336406	-0.489826	0.6331
INTR(5)	0.008159	0.259117	0.031488	0.9754
CRR(5)	0.390475	0.439652	0.888145	0.3919
LR(5)	-0.078079	0.138910	-0.562084	0.5844
TBR(5)	0.698846	0.787518	0.887403	0.3923
CBTC(5)	-0.865870	0.849821	-1.018886	0.3284
INFR(3)	-0.036320	0.045160	-0.804250	0.4369
FITTED^2	-0.043793	1.424187	-0.030749	0.9760
R-squared	0.972699	Mean dependent var		0.390042
Adjusted R-squared	0.947672	S.D. dependent var		0.082288
S.E. of regression	0.018824	Akaike info criterion		-4.800554
Sum squared resid	0.004252	Schwarz criterion		-4.211527
Log likelihood	69.60664	Hannan-Quinn criter.		-4.644285
F-statistic	38.86702	Durbin-Watson stat		1.561150
Prob(F-statistic)	0.000000			

Source: Author's E-views computation

7. Residual Unit Root Test for model I

Null Hypothesis: ECT 1 has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=5)				
			t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic			-6.016212	0.0000
Test critical values:	1% level		-3.724070	
	5% level		-2.986225	
	10% level		-2.632604	
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT1)				
Method: Least Squares				
Date: 03/27/18 Time: 06:33				
Sample (adjusted): 1990 2014				
Included observations: 25 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT 1(-1)	-1.241803	0.206410	-6.016212	0.0000
C	6.57E-05	0.000578	0.113636	0.9105
R-squared	0.611452	Mean dependent var		-9.63E-05
Adjusted R-squared	0.594559	S.D. dependent var		0.004534
S.E. of regression	0.002887	Akaike info criterion		-8.780504
Sum squared resid	0.000192	Schwarz criterion		-8.682994
Log likelihood	111.7563	Hannan-Quinn criter.		-8.753459
F-statistic	36.19480	Durbin-Watson stat		1.887533
Prob(F-statistic)	0.000004			

Source: Author's E-views computation

9. Residual Unit Root Test for model 2

Null Hypothesis: ECT2 has a unit root				
Exogenous: Constant				
Lag Length: 3 (Automatic - based on SIC, maxlag=6)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.686016	0.0017
Test critical values:	1% level		-3.831511	
	5% level		-3.029970	
	10% level		-2.655194	
*MacKinnon (1996) one-sided p-values.				
Warning: Probabilities and critical values calculated for 20 observations				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT2)				
Method: Least Squares				
Date: 03/27/18 Time: 11:26				
Sample (adjusted): 1992 2015				
Included observations: 19 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT2(-1)	-2.955025	0.630605	-4.686016	0.0004
D(ECT2(-1))	1.372082	0.509500	2.692999	0.0175
D(ECT2(-2))	0.996349	0.362415	2.749197	0.0157
D(ECT2(-3))	0.559655	0.221171	2.530413	0.0240
C	0.000554	0.000586	0.945679	0.3603
R-squared	0.779475	Mean dependent var		-9.96E-05
Adjusted R-squared	0.716468	S.D. dependent var		0.004582
S.E. of regression	0.002440	Akaike info criterion		-8.973066
Sum squared resid	8.33E-05	Schwarz criterion		-8.724529
Log likelihood	90.24413	Hannan-Quinn criter.		-8.931004
F-statistic	12.37124	Durbin-Watson stat		2.051113
Prob(F-statistic)	0.000164			

Source: Author's E-views computation

14. Residual Unit Root Test for Model 3

Null Hypothesis: ECT3 has a unit root	

Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=5)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.919549	0.0007
Test critical values:	1% level		-3.752946	
	5% level		-2.998064	
	10% level		-2.638752	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT3)				
Method: Least Squares				
Date: 03/27/18 Time: 15:34				
Sample (adjusted): 1989 2013				
Included observations: 23 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT3(-1)	-1.302931	0.264848	-4.919549	0.0001
C	-0.000163	0.000568	-0.286512	0.7773
R-squared	0.535418	Mean dependent var		0.000331
Adjusted R-squared	0.513295	S.D. dependent var		0.003844
S.E. of regression	0.002682	Akaike info criterion		-8.921745
Sum squared resid	0.000151	Schwarz criterion		-8.823006
Log likelihood	104.6001	Hannan-Quinn criter.		-8.896912
F-statistic	24.20196	Durbin-Watson stat		1.434826
Prob(F-statistic)	0.000072			

Source: Author's E-views computation

15. Residual Unit Root Test For model 4

Null Hypothesis: ECT4 has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=6)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.399543	0.0000
Test critical values:	1% level		-3.689194	
	5% level		-2.971853	
	10% level		-2.625121	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECT4)				
Method: Least Squares				
Date: 03/28/18 Time: 06:13				
Sample (adjusted): 1989 2016				
Included observations: 28 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT4(-1)	-1.212511	0.189468	-6.399543	0.0000
C	8.78E-05	0.000580	0.151390	0.8808
R-squared	0.611675	Mean dependent var		6.97E-05
Adjusted R-squared	0.596739	S.D. dependent var		0.004830
S.E. of regression	0.003067	Akaike info criterion		-8.667196
Sum squared resid	0.000245	Schwarz criterion		-8.572038
Log likelihood	123.3407	Hannan-Quinn criter.		-8.638105
F-statistic	40.95416	Durbin-Watson stat		1.906241
Prob(F-statistic)	0.000001			

Source: Author's E-views computation

Appendix A: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model I)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 0, 1, 0)				
Case 3: Unrestricted Constant and No Trend				
Date: 08/27/18 Time: 14:41				
Sample: 1986 2016				
Included observations: 30				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.043790	0.061578	-0.711126	0.4842
HDI(-1)*	-0.026362	0.012556	-2.099554	0.0469
CC**	0.064582	0.061107	1.056871	0.3015
DD**	0.085580	0.063987	1.337455	0.1942
QM(-1)	0.046131	0.061367	0.751718	0.4598
INFR**	6.74E-05	0.002821	0.023876	0.9812
D(QM)	0.076006	0.060717	1.251813	0.2232
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CC	2.449846	2.735490	0.895579	0.3798
DD	3.246379	2.690257	1.206717	0.2398
QM	1.749917	2.505227	0.698507	0.4919
INFR	0.002555	0.106980	0.023885	0.9812
EC = HDI - (2.4498*CC + 3.2464*DD + 1.7499*QM + 0.0026*INFR)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.092733	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
Actual Sample Size	30		Finite Sample: n=30	
		10%	2.752	3.994
		5%	3.354	4.774

		1%	4.768	6.67
t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-2.099554	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

Appendix B: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model II)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 1, 0)				
Case 3: Unrestricted Constant and No Trend				
Date: 08/27/18 Time: 14:54				
Sample: 1986 2016				
Included observations: 30				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018361	0.004143	4.432444	0.0002
HDI(-1)*	-0.026560	0.006743	-3.938779	0.0006
INTR**	0.010206	0.013220	0.771980	0.4477
MPR(-1)	8.46E-06	2.68E-06	3.158563	0.0042
INFR**	-0.001644	0.002434	-0.675529	0.5058
D(MPR)	1.88E-06	1.84E-06	1.021610	0.3172
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR	0.384264	0.544574	0.705622	0.4872
MPR	0.000319	0.000121	2.634476	0.0145
INFR	-0.061905	0.089381	-0.692599	0.4952
EC = HDI - (0.3843*INTR + 0.0003*MPR -0.0619*INFR)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	

F-statistic	7.992798	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	30		Finite Sample: n=30	
		10%	3.008	4.15
		5%	3.71	5.018
		1%	5.333	7.063
t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-3.938779	10%	-2.57	-3.46
		5%	-2.86	-3.78
		2.5%	-3.13	-4.05
		1%	-3.43	-4.37

Appendix C: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model III)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 0)				
Case 2: Restricted Constant and No Trend				
Date: 08/27/18 Time: 14:59				
Sample: 1986 2016				
Included observations: 29				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012547	0.005129	2.446525	0.0218
HDI(-1)*	-0.023827	0.007319	-3.255591	0.0032
LR**	0.014690	0.007141	2.057275	0.0502
INFR**	-0.000461	0.002867	-0.160851	0.8735
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	0.616531	0.386266	1.596130	0.1230
INFR	-0.019357	0.118254	-0.163691	0.8713
C	0.526597	0.140181	3.756557	0.0009

EC = HDI - (0.6165*LR -0.0194*INFR + 0.5266)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	68.40978	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	29		Finite Sample: n=35	
		10%	2.845	3.623
		5%	3.478	4.335
		1%	4.948	6.028
			Finite Sample: n=30	
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Appendix D: Autoregressive Distributed Lag (ARDL) Bounds Test for Cointegration (HDI Model IV)

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Selected Model: ARDL(1, 0, 0, 0)				
Case 3: Unrestricted Constant and No Trend				
Date: 08/27/18 Time: 15:02				
Sample: 1986 2016				
Included observations: 30				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013355	0.005230	2.553284	0.0172
HDI(-1)*	-0.019871	0.008480	-2.343117	0.0274
CBTC**	-0.023396	0.033454	-0.699358	0.4908
TBR**	0.054173	0.036837	1.470610	0.1539
INFR**	-0.002126	0.002896	-0.734300	0.4696
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as Z = Z(-1) + D(Z).				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBTC	-1.177428	1.704288	-0.690862	0.4960
TBR	2.726278	2.330155	1.169998	0.2530
INFR	-0.107014	0.144075	-0.742767	0.4645

EC = HDI - (-1.1774*CBTC + 2.7263*TBR -0.1070*INFR)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.699604	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	30		Finite Sample: n=30	
		10%	3.008	4.15
		5%	3.71	5.018
		1%	5.333	7.063

t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-2.343117	10%	-2.57	-3.46
		5%	-2.86	-3.78
		2.5%	-3.13	-4.05
		1%	-3.43	-4.37