MONETARY POLICY AND INFLATION CONTROL: THE CASE OF NIGERIA

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Abstract:

Inflation is a major problem facing Nigeria as a country today. The Central Bank of Nigeria (CBN), however, has made efforts to fight it using different policy measures, of which monetary policy is one of them. Thus, this study focuses on the impact of monetary policy on inflation control in Nigeria. The study is based on time series data from 1980 to 2019. The Augmented Dickey Fuller test, Johansen's co-integration test, the Error Correction model (ECM) estimation was employed in the analysis. The variables include – exchange rate, inflation rate, money supply (% GDP), Treasury bill rate and monetary policy rate. The research findings showed that monetary policy has no significant impact on inflation control in Nigeria both in the short – run and long – run. Money supply has negative and insignificant impact on inflation control in Nigeria both in the short – run and long – run. Again, exchange rate has negative and insignificant effect on inflation control in Nigeria both in the short – run and long – run. The Treasury bill rate has negative but significant effect on inflation control in Nigeria in the short – run, while in the long – run it has positive but insignificant effect on inflation control in Nigeria. The study, therefore, recommends that, Government should provide monetary policies that will preferred efficient provider of favourable environment in terms of the

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implementation of the appropriate monetary policy rate, exchange rate etc in order to attract both domestic and foreign investment which will create employment opportunities for the Nigerian populace and in turn lead to the expansion of the industries in the country.

JEL: E42; E52; E31

Keywords: exchange rate, inflation rate, money supply, treasury bill rate, monetary policy rate

1. Introduction

Monetary policy is the summation of the economic measures designed to regulatory authorities in-charge of regulating or managing the dynamic economic variables that affect changes in the prices of goods and services and hence the value of money. Usually, these dynamic economic variables are grouped as short-term macroeconomic factors and include instruments like demand and supply of money, interest/discount rates, volume of credits, and size of deposit money institutions' reserves. These instruments are so volatile that their regulation/management has direct implications on the price stability goals of macroeconomic authorities. Of course, it is worth noting that price generally covers the values that goods and services as well as foreign exchanges are traded. Although little emphasis is paid to deflation, most concerns of regulatory authorities have been on inflation, over time. It is against this background that this study is conducted to ascertain the veracity of the link or relationship between monetary policy and the commonly dreaded economic phenomenon called inflation (Okwu, et al., 2011; Adesoye, et al., 2012).

Again, as the controversy on the role of money supply in the control of inflation rages on between classical, Keynesian, monetary and neoclassical economists; managers and policy-makers of emerging economies are tilting towards a combination of the various postulations in managing inflation, with the main focus on inflation targeting as the guiding framework of monetary policy actions (Demchuk & Łyziak, 2012; Mukherjee & Bhatta, 2011). Inflation is an economic condition in which more money is demanded in periods of falling value of money as a result of consistent, persistent and sustained increases in the prices of goods and services. It is the economic phenomenon that describes the reduction in the purchasing power per unit of money, meaning a loss of real value in the medium of exchange and unit of account within the economy.

Inflation is a monster that threatens all economics because of its undesirable effects. According to Badreldin (2014), inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. Rutasitara (2004) notes that authorities have to keep an eye on the different factors that may easily trigger a rise in inflation at all times, even when the rate of inflation seems to be low because it could erode the value of money holdings, trade flows, investor confidence, etc. Omotosho and Doguwa (2013) state that inflation

causes higher risk premia, hedging costs, unforeseen redistribution of wealth and ultimately a reduction in overall economic growth. Lipsey and Chrystal (1995) stress that inflation is bad especially when it is unexpected because it distorts the working of the price system, creates arbitrary redistribution from debtors to creditors, creates incentives for speculation as opposed to productive investment activity. The problem of inflation surely is not a new phenomenon. It has been a major problem in developing countries like Nigeria over the years.

Undoubtedly one of the macroeconomic goals which the government strives to achieve is the maintenance of stable domestic price level (Sugema & Bakhtiar, 2010). This goal is pursued in order to avoid cost of inflation or deflation and the uncertainty that follows where there is price instability (Salam, et al., 2006). But policymakers in most developing economies have not been able to keep inflation at desired rates because of their inability to determine the predictors of inflation and its nature. Due to this reason, policies prescriptions that have been administered as an antidote had been ineffective since a wrong diagnosis of the problem has been made.

However, policy makers have tried to adopt appropriate policies that can combat inflation and ensure price stability (Adedeji & Nuhu, 2015). Generally, the level of money supply and the stock of goods and services are two crucial factors that determine the level of inflation in an economy. When inflation becomes persistent, the duo becomes the primary targets of policies. An excess or shortage in the supply of money could either induce excess aggregate demand resulting in higher inflation rate or induce stagnation thus retarding economic growth and development. While fiscal policy proves helpful in combating inflationary pressure, monetary policy has been the principal tool often employed by the central banks to ensure price stability. While it is not arguable that monetary authorities have formulated various policy measures as an attempt to curbing inflationary menace, the effectiveness of policy pursuit to curb inflationary environments is questionable as most economies, particularly developing ones still experience inflationary challenges. Therefore, this study intends to examine the impact of monetary policy on inflation control in Nigeria.

1.1 Statement of the Problem

The primary objective of monetary policy in Nigeria is price stability. But despite the various monetary regimes that have been adopted by the Central Bank of Nigeria over the years, inflation still remains a major threat to Nigeria's economic growth. Although the inflation rate has been relatively kept low in recent years, Nigeria's experience of inflation is nothing good to write home about. Nigeria has experienced high volatility in inflation rates. Oyakhilomen and Rekwot (2014) traced the history of inflation in Nigeria to the 1960s when "*cheap money policy*" was adopted by the government to stimulate development after independence. Since the early 1970's, there have been four major episodes of high inflation, in excess of 30 percent (CBN, 2009). The growth of money supply is correlated with the high inflation episodes because money growth was often in excess of real economic growth. However, preceding the growth in money supply, some factors reflecting the structural characteristics of the economy are observable. Some of

these are supply shocks, arising from factors such as famine, currency devaluation and changes in terms of trade.

Structural factors have proven to be important in the inflation spiral. Reduction in oil revenue (a supply shock) led to a reduction in real income, with serious distributional implications. As workers pushed for higher nominal wages, while producers increased mark-ups on costs, an inflationary spiral followed. In addition to these factors the government also had a transfer problem in order to meet debt obligations.

However, monetary policy reforms and inflation menace remains the Nigerian question. Upon her efforts in various policies over a long period of time, yet inflation outweighs per capita income. Nigeria's attempt for citizenry utility maximization, which is, achieving greatest happiness for the greatest number, is still undermined. According to Gbadebo and Mohammed (2015), necessitating the extent at which monetary policy reform has controlled inflation is still uncertain following its direction of causality. Hence, the need for a bearable limit inflation that can match the Nigerian situation of whose half population is living in extreme hunger, poverty, and unemployment. Meanwhile, Gbadebo and Mohammed (2015) concluded that inflation causes poverty as few who are working at the prevailing wage rate could not even save for investment.

Furthermore, over years, the Nigerian economy faced socio-economic stagnations traceable to inflationary spiral, particularly in the 1970s (Onwachukwu, 2014). Analysis of the non-case inflation in the early 1990s reveals inflation rate of 63.6% in late 1994. Headline inflation rose rapidly by 1995 to reach an all-time high of 72.8%, though it decelerated gradually to a single digit in 1997. In the same vein, core inflation, which began a gradual ascent in early 1990, peaked at about 69.0% in the mid 1995 before showing down in 1997. Since then, inflation remained at single digits between 1998 and 2001. In 2003 macroeconomic stability was restored, following the gains of a comprehensive and consistent economic reform programme. The low inflation rate regime did not last for too long with the resurgence of spikes in headline and care inflation between 2000 and 2001. Headline inflation rate remained at double 12.9%, 14%, 15% and 17.9% in the respective years. However, it decelerated dramatically to 8.24% and 5.38% in 2006 and 2007 before rising astronomically to 11 .60% and 12.00% in 2008 and 2009 in that order, although fell marginally to 11.8% and 12.3% in 2010 and 2013. However, it later rose up to 12.7% and 16.8 in 2014, 2016 respectively and 16.5% in 2017. The main thrust of this study is to evaluate the impact of the CBN's monetary policy on inflation control over the years. This would go a long way in assessing the extent to which the monetary policies have been effective.

The main objective of this study is to explore the impact of monetary policy on inflation control in Nigeria. However, the following specific objectives would also be achieved.

1) To establish the impact of monetary policy on inflation in Nigeria;
2) To examine the impact of money supply on inflation in Nigeria.

2. Review of Related Literature

2.1 Conceptual Framework

Monetary policy also refers as 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. Some of the objectives include: economic growth, price stabilization, Balance of Payment Equilibrium, Employment generation, etc. (Adesoye, et al., 2012). However, Ackley (1978) notes that one of the objectives of the monetary policy, which is the attainment of a high rate of or full employment, does not mean zero unemployment since there is always a certain amount of frictional, voluntary or seasonal unemployment.

However, inflation refers to the continuous rise in the general price level of goods and services in an economy, manifesting in the form of a decline in the value of money. The effects of high inflation are generally considered to be harmful on the economy. That is why the achievement of price stability has always been one of the fundamental objectives of macroeconomic policy in both developed and less developed countries (Orubu, 1996). Inflation is a disease that must be eradicated if a country must experience growth. It arbitrarily redistributes income, wipes out saving, erodes the income of fixed income earners, leads to distortion of price and brings about misallocation of society economic resources.

2.2 Theoretical Review
2.2.1 Quantity Theory of Money

The quantity theory of money was first developed by Irving fisher in the inter-war years, and is a basic theoretical explanation for the link between money and the general price level (Geoff, 2012). Fisher (1932), in his quantity theory of money, opine that like other classical writers the short-run monetary control was dictated by interest rates which were sticky but in the long-run the demand of influence was real cash balance. Fisher further assumed that the rise in commodity prices would precedes the increased in interest rate which was regarded as main channel of the firms' operation cost (Jelilov, 2016).

The quantity theory of money gives the relation between money, prices, and output:

$$M \times V = P \times Y \tag{2.1}$$

Equation (2.1) is the quantity equation, linking the price level and the level of output to the money stock. The quantity equation transformed to classical quantity theory of money when it was argued that both V, the income velocity of money, and Y, the level of output, were fixed. Real output was taken to be fixed because the economy was at full employment, and changes in velocity were assumed to be negligible. If both V and Y are fixed, it follows that the price level is proportional to the money stock. Thus, the classical quantity theory was the theory of inflation. The classical quantity theory is the proposition that the price level is proportional to the money stock. It can be viewed

as a theory of price determination suggesting that the equilibrium price level is strictly proportional to the quantity of money.

2.2.2 Keynesian Liquidity Preference Theory

Keynes (1936) developed the liquidity preference theory in his famous book, 'The general theory of Employment, Interest, and Money'. He studied both transaction and asset theories of money demand. Keynes distinguished three motives of holding money- a 'transaction motive', a 'precautionary motive' and a 'speculative motive'. The speculative demand for money is Keynes's most important innovation. According to this theory, demand for money is negatively related to interest rate. Implication of the theory is that the demand for speculative money balances depends on both the observable market nominal interest rates and the people's expectation concerning that rate in the future.

Keynes describes some normal value that determines the decision of the people either to hold bonds or money. If interest rates are above the normal value, people will expect them to fall, bond prices to rise and capital gains to be realized. In such a case, people will hold wealth in terms of bonds and demand for money will fall. If the converse holds, bond prices fall and capital losses are realized. People will demand to hold wealth in terms of money causing high demand for money. At very low interest rate, the expectation will be that it will rise; demand for money in the aggregate will be perfectly elastic with respect to interest rate leading to a liquidity trap. Combining the three demands gives the Keynesian liquidity preference function that describes the total demand for money.

$$Md/ P = \mu(R, Y) \quad \mu1<0; \mu2>0 \qquad (2.2)$$

μi denotes partial derivative of $\mu(.)$ with respect to ith argument.

The function shows that the demand for real money balances is negatively related to the nominal interest rate, R, and positively related to real income, Y. In contrast to the quantity theory preposition that velocity is constant; the Keynesian liquidity preference theory implies that velocity is procyclical, since procyclical interest rate movements induce procyclical velocity movements.

2.2.3 Structuralism Theory

The inelasticity in the structures of the economy is the main drive of inflation based on this theory. This is mainly obtainable in the developing countries. This is as result of inelasticity in capital formation, institutional framework, labour force, production level, agricultural sector and unemployment structures. Therefore, inflation sets in due to inefficiency in the structures of the economy.

In other words, according to this theory, inflation is caused by structural imbalances such as imbalance between demand and supply of industrial inputs. Governments are forced to rely on deficit financing because of insufficient external borrowing, grants and aid. Other structural imbalances causing inflation include food scarcity, foreign exchange bottlenecks, and infrastructure bottlenecks, social and political

constraints. Structuralist economists argue that inflation is a manifestation of structural rigidities in the system.

2.2.4 The Demand Pull Theories of Inflation

Demand – pull theories of inflation define inflation situations where aggregate demand for goods and services exceed aggregate supply, thereby leading to a general rise in price levels (Gbanador, 2007). Usually, the shortages create competition on the side of demand for the few available products leading to some kind of informal bidding for available items. The aggregate demand for these goods and services includes the private demand for consumers' good, business firms and government including final output and inputs (Gbanador, 2007). The demand – pull inflation may also be called surplus demand inflation because it arises from too much money chasing few goods. More often it occurs where there is full employment so that the excess pressure on the factors of production leads to higher prices for the factors, ultimately leading to rise in the cost of production. It could also be a short run phenomenon where demand dynamics were not well anticipated. When there are production constraints, demand beyond the possible output level could also create inflation (Otto, 2011).

Demand – pull inflation may occur during cyclical booms during or immediately after war, this explains its high rates in Nigeria during 1969 to 1970 Nigerian civil war. The rate of inflation during the war was very high. In Biafran enclave, inflation was in three digits. These may not have been officially reported in their exact forms. In other words, inflation rates in Nigeria are generally believed to be under reported (Otto, 2011). The demand pull inflation may be explained using the old or new quantity theory of money or the Keynesian theory. The quantity theory of money attempts to explain the link between money and general price levels. The quantity theory (also referred as monetarists view) emphasise the influence of money supply as prime determinants of inflation (Jhinghan, 2008) while the Keynesians emphasize on non – monetary factors such as government expenditure, spending pattern and credits. The classical economist of the 17th Century connected the quantity theory of money to the general rise in prices. The crude quantity theory of money (of classical economy) state that the quantity of money at any given point in time is proportional to rise in prices (Jhinghan, 2008).

The monetarist school of thought led by Milton Friedman (1942) posits that inflation is "*always and everywhere a monetary phenomenon and that it is everywhere since increases in the quantity of money always exceeds output*". Irving Fisher's equation of exchange could be employed to explain the monetarist view. Fisher (1913) starts the analysis with a single identity that MV=PT. Fisher believes that in every transaction, there is a buyer and seller in the aggregate economy, the value of sales must be equal to the value of receipts. This identity can be mathematically modelled as follows:

$$MV = PT \qquad (2.3)$$

M = Quantity of money (nominal) in circulation
V = Transaction velocity of money in final expenditures

P = General price level

T = Volume of transactions

Therefore, in reviewing the monetarist view and the concept of circulation, Fisher defines price (P) as a function of money supply (M), volume of transactions (T) and velocity of circulation (V), that is:

$$P = F (M, V, T) \qquad (2.4)$$

In equation (2.5), where MV = PT, Fisher assumes V and T to be constant variables, so M varies directly with P.

$$P = M \qquad (2.5)$$

However, Fisher's equation failed to consider the impact of interest rates. It is also doubtful that M.V.P and T are fully independent as a change in any of them impacts on the others and can affect inflation.

This shortfall in Fishers' equation, prompted Keynes (1940) to focus on the inflationary gap. Keynes explained that inflationary gap is a process where planned expenditure exceeds the equilibrium in the system; if there is a state of under – employment in the economy, an increase in the money supply will eventually lead to an increase in aggregate demand, output and employment (Onuchukwu & Adoghor, 2000). However, as aggregate demand, output and employment rise further, and impacts on price. When money supply increases beyond full employment, output causes to rise. The excess money supply leads to an excess demand over supply and leads to an inflationary gap. This to Keynes is the true source of inflation. Keynes inflationary gap analysis is illustrated graphically in Figure 2.1 below.

Figure 2.1 shows the points where full employment (YEF$_1$) equilibrates with the total output. It is being represented by a 45° line which cuts through point B. However, if there are further increases in aggregate demand, it will cause a shift in expenditure as shown at point E, and this will make the total expenditure to be at YE$_1$ while the available output is BAYE. Nevertheless, Keynes has been criticized. The major thrust of critics is that the inflationary gap analysis is focused on the commodity market only and the analysis neglects the role of the factor markets. It is argued that inflation affects both commodity and factor markets because the excess demand caused by the commodity market would have an impact on the factor market. In point, Keynes analysis has two main drawbacks: (a) it lays emphasis on demand (b) it ignores the possibility that a rise in price may in turn lead to further increases in aggregate demand, which may in turn lead to further rise in prices (Jhinghan 2008).
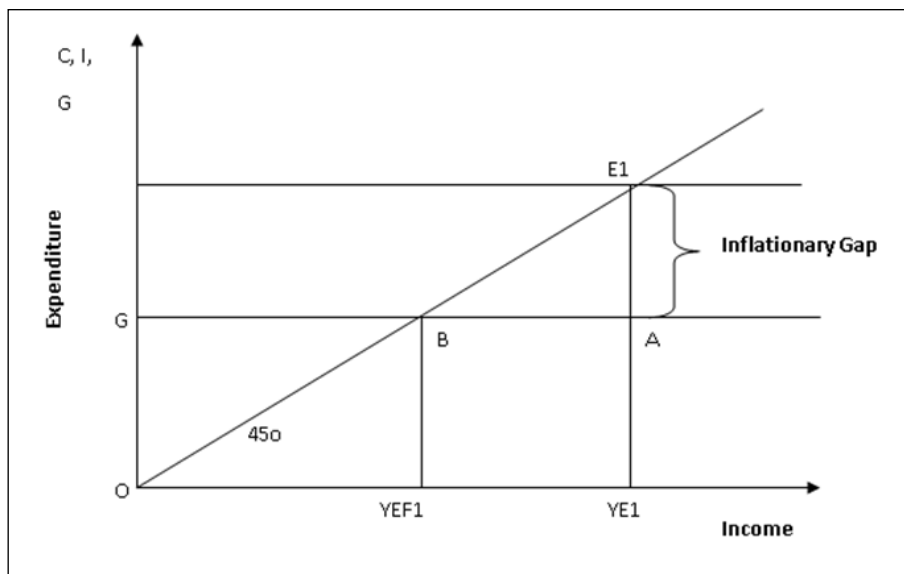
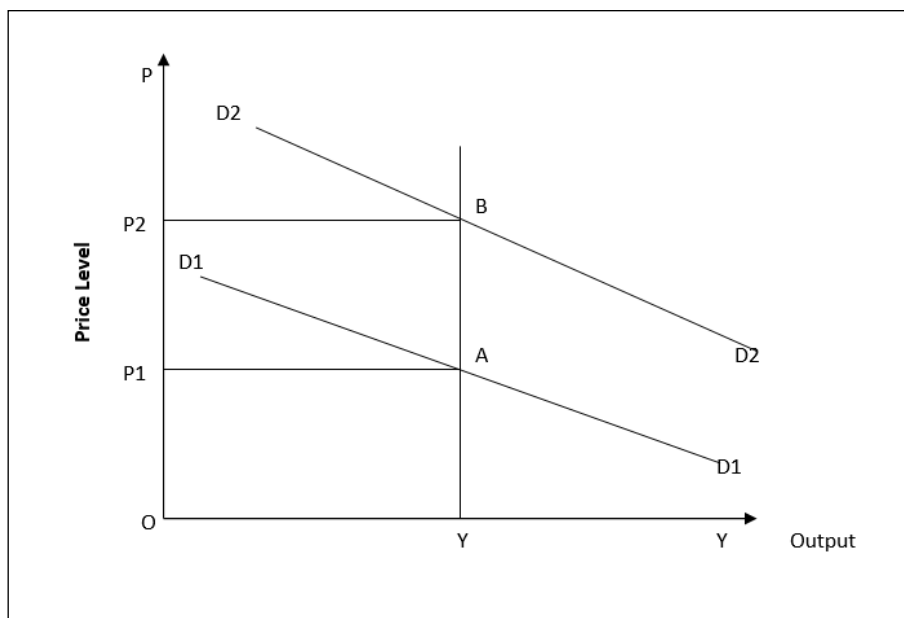**Figure 2.1:** Illustration of Keynesians Theory of Demand Pull Inflation

Figure 2.2: The Demand Pull Theory of Inflation (Quantity Theory Version)

Figure 2.2 shows that if the economy is in full employment, the Equilibrium price P_1 cuts the Demand curve D_1 at A. However, further demand as shown in D_2 will raise prices to P_2. It means that employment, and aggregate supply cannot be increased at the short run to offset the excess demand created by the shift. This is because output and supply are fixed at $0Y_1$.

2.2.5 Cost – Push Theories of Inflation

Cost- push defines inflation arising from the supply side. It is often caused by the rising cost of production. This occurs when production costs increase and impact on the prices of the final products (Otto & Nenbee, 2011). The cost push inflation can also be called the 'market power inflation' because the increase in the prices of goods and services originates from the supply side of the economy. These increases may arise from increased

wage rates or a fall in productivity, which also increases cost of labour output. It may also arise out of other factors of production or cost of inputs such as power supply, transport or raw materials (Otto & Nenbee, 2011). In Nigeria, multiple taxation and corruption are major suspects (Otto, 2011). These and other factors cumulatively influence the cost structure of products and determine the prices of the final output. Producers would react to rise in input prices by increasing prices of output including their profits margins, since these are usually set at fixed percentage of cost of production. However, an increase in the cost of production can force producers to cut down production (Otto, 2011).

Cost- push inflation may also arise as a result of profit motives of producers in monopolistic and Oligopolistic industries (Otto, 2011). Since there is a state of imperfection in such industries, their producers could administer their prices through price discrimination techniques.
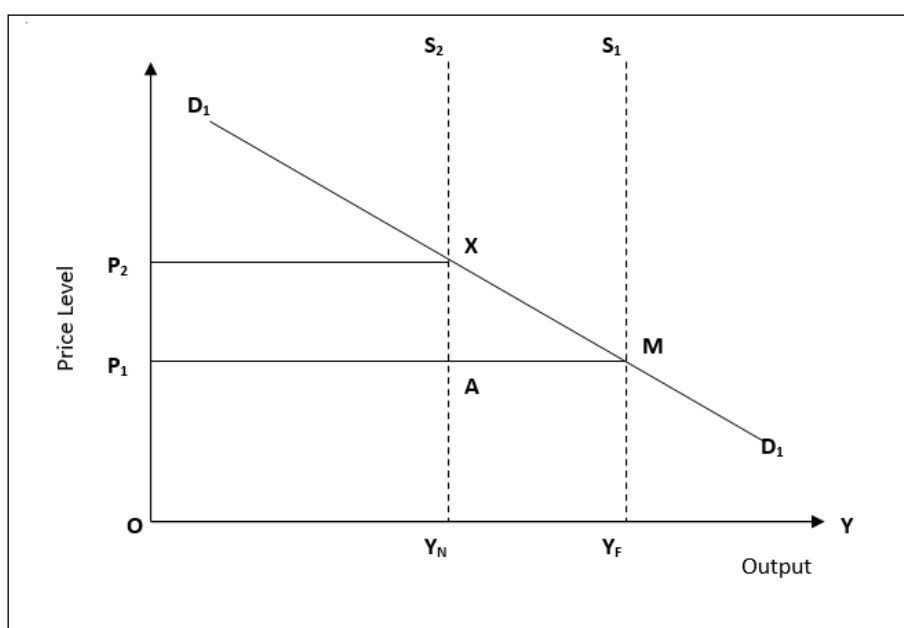

Figure 2.3: Diagram Depicting the Cost – push Inflation

Figure 2.3 illustrates inflationary tendencies caused by supply- side factors. Point M. is referred to as the equilibrium point at full employment. At this point, price is P_1 and quantity of output is Y_f, but if the cost of inputs rise (such as increasing wages, rising cost of power supply through removal of fuel subsidy, amongst others), some suppliers with limited resources could cut production. This will lead to a fall in aggregate output of the particular industry as shown in Y_N. So, supply moves from S_1yF to S_2YN. This reduction in total supply distorts the full equilibrium position and causes bidding among demand (from buyers) for the available goods, which ultimately shoot-up the price from P_1 to P_2 and a new equilibrium point at X. This explanation makes meaning in a market economy where the market is an allocator of economic resources. Another way to explain the cost-push (supply – side) inflation is to look at the behaviour of suppliers. As a result of increasing cost of production (often not peculiar to any producer), suppliers generally shift the burden of increased cost of production to the consumers by way of general price increases (Onuchukwu & Adoghor, 2000). If all suppliers do so, this is likely to lead to

general rise in the prices of products. This is more common in imperfect markets. In Nigeria, cost-push inflation is quite common. Every time government announces a new minimum wage, there is a rise in the prices of goods and services leading to inflation (Otto, 2011).

2.3 Empirical Literature

Using Autoregressive distributed lag model (ARDL) bound test is used for the long-run relationship and a VAR analysis for the short-run dynamics, Bayramoglu and Allen (2017) investigated the determinants of inflation and the effectiveness of the monetary transmission in Turkey. The study is covering the period 2003:Q2-2015:Q3 which consists of just an inflation targeting time before 2008, and inflation and financial stability targeting time after 2008 global financial crises. The cointegration results reveal that the credit growth, US/TL exchange rate, real effective exchange rate, interest rate, and imported inflation are the determinants of inflation in Turkey in the long run. The research findings indicate that exchange rate is the most effective factor in inflation. According to the VAR model's impulse responses, the key drivers of inflation are the movements in the US/TL nominal effective exchange rate, real effective exchange rate, interest rate, GDP growth in the short-term, and credit growth is in the medium-term. ARDL cointegration and impulse responses also show that interest rate and credit growth are efficient instruments as a monetary policy for the inflation targeting and financial stability. Similarly, Itodo, Akadiri and Ekundayo (2017) examined the monetary policy in stabilizing price level in Nigeria from 1981 to 2015. The study employed the Vector Autoregressive (VAR) model, with in-built differencing to take care of unit root in these time series data, to capture this relationship. The research found that money supply has no significant relationship with price level in Nigeria. This, we believe, may be due to the influence of the large informal financial sector which controls a very significant fraction of money in circulation. Thus, policy reforms that would curb the influence of the informal financial sector should be implemented in order to allow the central monetary authority to work better, and enhance the role of monetary management in Nigeria.

Using ARDL model was used to ascertain the existence of long and short run equilibrium conditions, Ogunmuyiwa and Babatunde (2017) examined the impact of money policy on inflation in Nigeria using monthly data from January 2010 to October 2016 (2010:01 – 2016:10). The ARDL model was used to ascertain the existence of long and short run equilibrium conditions. The unit roots test showed that exchange rate, broad money supply and inflation were stationary at levels while narrow money and interest rate were stationary at first difference. The results showed that narrow money and interest rate have positive and significant impact on inflation in Nigeria both in the short run and long run. The study affirmed that there was long run relationship between monetary policies and inflation in Nigeria. The conclusion of the study is that monetary policy variables have significant impact on inflation in Nigeria, both in the short and long run.

Muhammad, AdeelAbidb, Aqeel and Aqsa (2017) empirically examined the relationship between the monetary policy and inflation and investigate the impact of

monetary policy attributes such as Gross domestic product (GDP), interest rate, export, money supply (M2), foreign direct investment (FDI), and inflation on the economy of Pakistan. Multiply regression ordinary least square correlation analysis is used in estimating relationship between the monetary policy and inflation and their impact on economy of Pakistan measure as the GDP, interest rate, money supply, export. For analysis the 20 years' data are used 1995 -2014. The result of this study may be helpful for the full employment, increase in the investment, economic development, and stability of capital market for the economy of Pakistan.

Ujuju and Etale (2016) examined the role of monetary policy instruments in controlling inflation in Nigeria from for the period covering 1982 to 2011. The study adopted interest rate, minimum rediscount rate, liquidity ratio, and cash reserve ratio as proxy for monetary policy instruments and the independent variables. These were regressed against inflation rate, the dependent variable. The study found that interest rate, minimum rediscount rate, liquidity ration and cash reserve ratio had no significant influence on inflation. Again, Nwoko, Ihemeje and Anumadu (2016) examined the impact of monetary policy on the economic growth of Nigeria covering the period of 1990-2011. The study used the money supply, average price, interest rate and labour force were tested on Gross Domestic Product using multiple regression models as the main statistical tool of analysis. The study revealed that average price and labour force have significant influence on Gross Domestic Product while money supply was not significant.

Kumo (2015) investigated the impact of inflation and monetary policy on economic growth in South Africa, using Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model to test annualized quarterly consumer price data for the period 1960Q1 to 2013Q3. Three monetary policy regimes were identified. The findings revealed that inflation volatility had statistically significant negative impact on economic growth during 1960Q1 to 1998Q3. But inflation volatility had no impact on economic growth during the period 1999 to 2013. The study concluded that South Africa achieved low and stable inflation rates conducive to economic growth from 2000 by adopting an inflation targeting monetary policy regime.

Using Ordinary Least Square (OLS) of simple regression model, Ezeanyeji and Ejefobihi (2015) examined the impact of inflation on economic growth of Nigeria between 1991 and 2013 and study showed that inflation has impacted negatively on economic growth of Nigeria. Gbadebo and Mohammed (2015) examined the effectiveness of monetary policy as a measure to control inflation in Nigeria. Time series data collected for the period 1980Q1 to 2012Q4 were tested using co-integration analysis and error correction model. The study identified interest rate, exchange rate, money supply and oil price as major causes of inflation in Nigeria. They also found that money supply showed significant positive impact on inflation in both the short and long run. Thus, they concluded that monetary impulses caused inflation in Nigeria.

Emerenini and Eke (2014) investigated the determinants of inflation in Nigeria using OLS technique and co-integration analysis test data collected for the period 2007 to 2014, the econometric model regressed inflation as a function of money supply, treasury bill rate, monetary policy rate and exchange rate. The study found that money supply

and exchange rate influenced inflation, while Treasury bill rate and monetary policy rate did not. Similarly, Iya and Aminu (2014) investigated the determinants of inflation in Nigeria between 1980 and 2012 using the ordinary least square method. The result revealed that money supply and interest rate influenced inflation positively, while government expenditure and exchange rate influenced inflation negatively. They suggested that for a good performance of the economy in terms of price stability may be achieved by reducing money supply and interest rate and also increase government expenditure and exchange rate in the country. Similarly, Hossain and Islam (2013) examined the determinants of inflation using data from 1990 to 2010 in Bangladesh with the ordinary least square method. The empirical result showed that money supply, one year lagged value of interest rate positively and significantly affect inflation. The result also indicated that one year lagged value of money supply and one year lagged value of fiscal deficit significantly and negatively influence over inflation rate. There was an insignificant relationship between interest, fiscal deficit and nominal exchange rate. The explanatory variables accounted for 87 percent of the variation of inflation in during the period.

2.4 Identified Research Gap

Existing literatures has only necessitated monetary policy instruments and theories as well as conflicting fact of whether inflation can be curbed, control or managed, but has failed to analyze explicitly the implication of the various monetary policy reforms on inflation control in Nigeria. This study also attempts to improve upon past studies in that apart from including non-monetary sources of inflation in Nigeria, sample data used will include data up to 1980 to 2019. This covers a period of financial innovation and world financial crisis. Most studies have concentrated on the period between 1980 and 2014, while some used quartering data for the period of 2010:01 – 2016:10.

3. Research Methodology

3.1 Theoretical Framework

The theoretical framework of this study is based on the Quantity Theory of money. This model has been used by Gbadebo and Mohammed (2015). They uphold that the relationship between national income evaluated at market price and the velocity of money circulation can said to be equal relationship. The equation shows a positive relationship between price level and money supply, and this can be represented using the quantity equation;

$$MV = PY \tag{3.1}$$

Where,
m is the stock of money in circulation,
v is the velocity of circulation,
p is the general price level, and

Y is the total income.

Hence, given an economy based on this theory, there will be a proportionate relationship between the money supply and the price level. This means that an increase in money supply by a certain percentage is expected to increase price level by the same percentage. This ordinarily means that expansion in money supply causes inflation.

3.2 Model Specification
In order to achieve the objectives of the study, the model adopted for this study is derived from the previous study carried out of by Ogunmuyiwa and Babatunde (2017) with modification. The functional form of the model is therefore specified as follows:

$$INF = f(MPR, MS, EXC, TBR) \tag{3.2}$$

The model can then be written explicitly as;

$$INF = a_0 + a_1 MPR + a_2 MS + a_3 EXC + a_4 TBR + \mu \tag{3.3}$$

where;
INF = Inflation rate
MPR = Monetary policy rate
MS = Broad money supply (% of GDP)
EXC = Exchange rate
TBR = Treasury bill rate
a_0 = Constant
a_1, a_2, a_3 and a_4 = Parameters
μ = Error term
It is expected that $a_0 > 0$, $a_1 > 0$, $a_2 < 0$, $a_3 < 0$ and $a_4 < 0$

3.3 Method of Estimation
The estimation method used in this study was drawn from developments in the co-integration theory. This has been developed to especially overcome the problems of spurious correlation often associated with non-stationary time series data.

3.3.1 Unite Root Test
As a first step we check the stationarity properties of the used variables. The order of integration for each variable is determined using Augmented Dickey- Fuller (1979) tests. Augmented Dickey-Fuller (ADF) unite root tests consists of running a regression of the first difference of series against the series of lagged once, lagged difference terms and optionally, a constant a time trend. The investigation of non-stationarity properties of time series is the basic test in empirical investigation in order to avoid spurious results. There are a number of alternative tests of time series properties. In this study Augmented Dickey-Fuller (ADF) test is used to check the order of integration of variables in our data set. The Augmented Dickey-Fuller (ADF) test is designed to distinguish between

stationary either about mean or trend and non-stationary processes (LIoyd & Rayner; 1993). A series Xt is said to be integrated of order d denoted by Xt~I(d) if it becomes stationary after differencing d times and thus Xt contains d unit roots (LIoyd & Rayner, 1993).

3.3.2 Co-integration Test

After the test for the order of integration, the next step is to test for co-integration. This test is used to check if long run relationship exists among the variables in the model (Ogundipe & Alege, 2013). This will be carried out using the Johansen technique. Johansen and Juselius (1990) stated that achieving result in this test amounts to establishing maximum-likelihood test procedure.

3.3.3 Error Correction Model (ECM)

The estimation procedure involved using conventional error correction model (ECM) to investigate the short run dynamics and long run equilibrium relationship among the data series. The application of ECM is necessary because, it is used to correct temporary short run deviation of a series within long run equilibrium relationship.

3.4 Sources of Data

Secondary data was used for this study which was sourced mainly from CBN publications – CBN Statistical Bulletin, 2019 respectively. The relevant variables sourced include: inflation rate, monetary policy rate, broad money supply (% of GDP), exchange rate and Treasury bill rate for the period from 1980-2019.

4. Analysis of Results

4.1 Unit Root Test

The analytical techniques discussed in the previous chapter were applied to the models of the study and the results are presented in this section. Since empirical analysis based on time series data would be biased if the underlying data are nonstationary, the unit root test is therefore necessary to check for the stationarity of the variables. As earlier noted, the test used for observing the stationarity of the time series data used for analysis in this study is the Augmented Dickey-Fuller (ADF) test. The results are summarized in Table 1 below.

Table 1: Summary of ADF Unit Root Test Result

Variables	ADF-Statistic	Critical Value			Order of Integration
		1%	**5%**	**10%**	
INF	-6.090839 (0.0000)	-3.626784	-2.945842	-2.611531	1(1)
MPR	-8.897966 (0.0000)	-3.626784	-2.945842	-2.611531	1(1)
MS	-5.703974 (0.0000)	-3.626784	-2.945842	-2.611531	1(1)
EXC	-3.632760 (0.0206)	-3.626784	-2.945842	-2.611531	1(1)
TBR	-6.808968 (0.0000)	-3.626784	-2.945842	-2.611531	1(1)

Source: Researcher's compilation using E-view 9.

The Augmented Dickey Fuller test is used to conduct the unit root estimate. From the unit root result in Table 1 above some observed that all the variables – inflation rate (INF), monetary policy rate (MPR), money supply (MS), exchange rate (EXC) and treasury bill rate (TBR) were not stationary at levels but became stationary after first differencing, indicating that series were integrated of order one, the variables were I(1) series. This provides a strong criterion for the cointegration analysis.

4.2 Co-integration Test

Since short run equilibrium has been revealed to exist among the series, there is the need to investigate the existence or otherwise of long run equilibrium among these series. This test will be done using the Johansen cointegration test.

Table 2: Cointegration Result

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value 0.05	Prob.**
None*	0.782804	180.1619	69.81889	0.0000
At most 1*	0.742790	128.2454	47.85613	0.0000
At most 2*	0.644590	82.07816	29.79707	0.0000
At most 3*	0.571291	46.90575	15.49471	0.0000
At most 4*	0.412925	18.10851	3.841466	0.0000
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
None*	0.782804	51.91649	33.87687	0.0000
At most 1*	0.742790	46.16726	27.58434	0.0000
At most 2*	0.644590	35.17241	21.13162	0.0000
At most 3*	0.571291	28.79724	14.26460	0.0000
At most 4*	0.412925	18.10851	3.841466	0.0000
Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Source: Researcher's Compilation using E-view 9.

From Table 2 above, it is evident that there are five cointegrating equations in the series at 5 percent level of significance for both trace statistic and maximum Eigen values respectively thereby confirming the existence of a long-run equilibrium relationship between the variables and denotes rejection of the hypothesis of no co-integrating relationship at the 0.05 level. With this result, one proceeds to specify the long run and short run dynamic equation.

4.3 Long Run Estimates using Normalized Cointegration

Table 3 below shows the result of the normalized cointegration coefficients of the variables for the case of a cointegrated equation with respect to the standard error and t-statistic result associated with each variable. The value of the t-statistic is used to indicate the significance or otherwise of the independent variable in the long run. Generally using

the rule of thumb, if the t-statistics is 2 or greater than two, the variable is considered to be significant but if otherwise, it is insignificant.

Table 3: Long Run Estimates

Normalized Cointegrating Coefficients (Standard Error in Parentheses)				
D(INF,2)	**D(MPR,2)**	**D(MS,2)**	**D(EXC,2)**	**D(TBR,2)**
1.000000	-79.50770**	-19.75995	-1.492122	7.289026
	(8.91701)	(12.9324)	(1.46043)	(5.42034)
	[8.91640]	[1.52794]	[1.02170]	[1.34475]

Source: Author's Compilation using E-View 9.
Note: Standard error and t-statistics are stated in parenthesis ( ) and [ ] respectively.

A close examination of the individual coefficients of the explanatory variables of the long – run estimates showed in the table 3 above. The monetary policy rate (MPR) is found to have a significant long run relationship with inflation rate at 5 percent level of significance. A percentage change in MPR indicates 79.50 percentage changes in inflation rate. The above evidence further implies that the degree of the responsiveness of inflation rate to the lagged impacts of the variations in MPR is seen to be strongly elastic.

In the same vein, the results show insignificant support for the existence of a relationship between money supply (MS), Treasury bill rate (TBR) and inflation rate. An insignificant relationship between MS, TBR and inflation rate was found at 5 percent level of significance and furthermore reveals that, a percentage change in MS and TBR results to a corresponding 19.75 and 7.28 percent change in inflation rate holding other variables at a constant. The elasticity estimate reveals that the degree of responsiveness of inflation rate to the change per time in MS and TBR are higher than one and therefore elastic. Similarly, exchange rate (EXC) is found to have an insignificant long run relationship with inflation rate at 5 percent level of significance. A percentage change in EXC indicates 1.49 percentage changes in inflation rate. The above evidence further implies that the degree of the responsiveness of inflation rate to the lagged effects to the change per time in EXC is less than one and therefore seen to be inelastic. In line with this, error correction model is estimated in the next section, in order to derive the short-run dynamics.

4.4 ECM Regression Result

Table 4: Summary of the ECM Regression Result: Dependent Variable- D(INF)

Variables	Coefficient	Std. Error	t-statistic	Prob.
C	-0.103229	2.509586	-0.041134	0.9675
D(MPR)	1.772501	1.044205	1.697464	0.1000
D(MS)	-1.034756	1.366639	-0.757154	0.4549
D(EXC)	-0.007074	0.127669	-0.055407	0.9562
D(TBR(-1))	-1.276348	0.583461	-2.187548	0.0366
ECM(-1)	-0.680500	0.174071	-3.909315	0.0005
R²= 0.388112	F stat= 3.805714	R²Adj= 0.286131	Prob(F-statistic): =0.008677	Durbin-Watson Stat: 1.450115

Source: Researcher's compilation using E-view 9.

From Table 4 above, the coefficients, the constant (C) has a value of -0.000596, whose implication is that if all the explanatory variables are held constant or pegged at zero (0), the explained variable – inflation rate will decline by 10.3%. This shows that regardless of change on the explanatory variables, inflation rate will be reduced. The coefficient value of money supply, exchange rate and Treasury bill rate, implies that one percent increase in external debt is expected to result in a decline in inflation rate by 103.4%, 0.70% and 127% respectively. However, the result of the regression estimate showed that monetary policy rate had positive and insignificant impact on inflation rate in Nigeria; this indicates that one percent increase in monetary policy rate is expected to enhance inflation rate in Nigeria by 177.2 percent in Nigeria.

Regarding of the strength of significant of the variables, using the t-statistic, it shows that only Treasury Bill Rate (TBR) has negative but significant impact with the predictor variable – inflation rate. Other variables such as monetary policy rate (MPR), money supply (MS), and exchange rate (EXC) has insignificant impact on inflation rate in Nigeria.

The result of the error correction models indicates that the error correction term ECM (-1) is well specified, and the diagnostic statistics are good. The ECM (-1) variable has the correct sign and is statistically significant. Therefore, from the result, the coefficient value of -0.680500 for the ECM shows that about 68% of the disequilibrium/discrepancies in the previous period (short run) were corrected in the present period (long run). This therefore shows a high speed of adjustment to long run equilibrium.

The coefficient of multiple determinations (R^2) of 0.388112 indicates that 38.8% of total variation in the dependent variable can be explained by the explanatory variables, other variables not included in the model explain the remaining 61.2%. Coincidentally, the goodness of fit of the regression remained too low after adjusting for the degree of freedom. The F-statistic shows a probability of 0.008677, which is below the 0.05 significance level shows that the probability is significant and the model successful and finally, the value of Durbin–Watson (DW) (1.45) which reveals to us that there is some degree of positive autocorrelation in the residual.

5. Conclusion and Recommendations

This research work studied the impact of monetary policy on inflation control in Nigeria from the period 1980 – 2019. The Augmented Dickey Fuller test, Johansen's co-integration test, the Error Correction model (ECM) estimation were employed. From the analysis of this study on the impact of monetary policy on inflation control in Nigeria, the following are the main findings of the study:

1) The respective test showed that all the variables used in the model were stationary at first differencing respectively. The co-integration test showed that the null hypothesis of no co-integration among the variables was rejected, indicating a long run relationship. There are five co-integration equations among the variables which imply there is a long run relationship among the variables in the model.

2) Monetary policy has no significant impact on inflation control in Nigeria both in the short – run and long – run. This suggests that the problem of inflation in Nigeria is not a monetary phenomenon rather attributable to the structural rigidity in the country.

3) Money supply has negative and insignificant impact on inflation control in Nigeria both in the short – run and long – run.

4) Exchange rate has negative and insignificant effect on inflation control in Nigeria both in the short – run and long – run.

5) Treasury bill rate has negative but significant effect on inflation control in Nigeria in the short – run, while in the long – run it has positive but insignificant effect on inflation control in Nigeria.

The following recommendations could be made. The government and its relevant authorities:

1) Provide conducive investment environment by removing the structural rigidity that exist in the economy. The government should endeavour to provide stable supply power, good roads for transportation of goods and people, functional legal system, security of lives and property, infrastructural facilities etc. All these would boost productivity thereby making adequate goods and services available to meet the ever-increasing demand in order not to force up prices.

2) Make the monetary policies the preferred efficient provider of favourable environment in terms of the implementation of the appropriate monetary policy rate, exchange rate etc in order to attract both domestic and foreign investment which will create employment opportunities for the Nigerian populace and in turn lead to the expansion of the industries in the country.

The impact of the CBN's monetary policies as the tools for regulating the liquidity state of the economy which affects some macroeconomic indicators such as the inflation rate, monetary policy rate etc., cannot be over-emphasised. The Central Bank of Nigeria has gone a long way in providing the right environment for economic development by setting the monetary policies in motion in order to enhance the standard of living of the people and promote investment in the country by building confidence in the financial sector of the economy.

Conflict of Interest Statement
The authors declare no conflicts of interests.

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References

Adedeji, A. & Nuhu, N. (2015). Monetary policy and inflation control in Nigeria. *Journal of Business and Sustainable Development*, 6(8),108-115.

Adesoye, A. B., Maku, O. E. & Atanda, A. A. (2012). Is monetary policy a growth stimulant in Nigeria? A Vector Autoregressive Approach. *Munich Personal RePEc Archive (MPRA)*. No. 35844, pp. 1-24.

Ackley, G. (1978). *Macroeconomics: Theory and policy*. New York: Macmillan.

Badreldin, M. A. (2014). Inflation and economic performance in Sudan: An Analysis Study. *Researchjournali's Journal of Economics*, 2(3): 1-8.

Bayramoglu, A. T. & Allen, L. (2017). Inflation dynamics and monetary transmission in Turkey in the inflation targeting regime. *Journal of Reviews on Global Economics*,6(2),1-14.

Central Bank of Nigeria (2009). Annual Report and Statement of Account (December 2009): Central Bank of Nigeria Bulletin.

Demchuk, O. & Łyziak, T. (2012). Monetary policy transmission mechanism. What do we know in 2012?. *NBP Working Papers, 116*, National Bank of Poland.

Dickey, D. A. & Fuller, W. A. (1979). Distribution of the estimators for autoregressive times series with a unit root. *Journal of American Statistical Association*, 74:427-431.

Emerenini, F. M. & Eke, C. N. (2014). the impact of monetary policy rate on inflation in Nigeria. *Journal of Economics and Sustainable Development*, 5(28):146-153.

Ezeanyeji, C. I. & Ejefobihi, U. F. (2015). Inflation and Economic Growth in Nigeria: An Impact Analysis. *Wilolud Journals: Continental Journal of Social Sciences*, 8(1), 1-12

Fisher, I. (1932). Booms and depressions, New York, Adelphi company (Barber et al. (eds.) Vol. 10.

Fisher, I. (1913). *The purchasing power of money*. New York: MacMillan.

Gbanador, C. A. (2007). *Modern Macroeconomics*. Port Harcourt: Pearl Publishers.

Gbadebo, A. D. & Mohammed, N. (2015). Monetary policy and inflation control in Nigeria. *Journal of Economics and Sustainable Development*, 6(8),108-115.

Geoff, I. (2012). Business operators question monetary policy thrust of 2013 budget. *The Guardian Newspaper*. Sunday 21st October, 2012.

Hossain, T. & Islam, N. (2013). Economic analysis of the determinants of inflation in Bangladesh. *The International Journal of Social Sciences*, 11(1), 29-36.

Itodo, I. A., Akadiri, S. S. & Ekundayo, R. M. (2017). Monetary policy and price stability in Nigeria. Academic *Journal of Economic Studies*, 3(2),68–75.

Iya, I. B. & Aminu, U. (2014). An empirical analysis if determinants of inflation in Nigeria. *Journal of Economics and Sustainable Development*, 5(1),140-150.

Jhinghan, M. L. (2008). *Monetary economics*. New Delhi: Vrinda Publications India.

Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2), 169–210.

Keynes, J. M. (1940). *How to pay for the war*. London: Harcourt Brace.

Kumo, W. L. (2015). Inflation targeting monetary policy inflation volatility and economic growth in South Africa. *African Development Bank Group Working Paper No. 216*, 1 – 33.

Lloyd, T. A. & Rayner, A. J. (1993). Co-integration analysis and the determinants of land prices: Comment. *Journal of Agricultural Economics*, 44(1), 149-156.

Lipsey, R. G. & Chrystal, K. A. (1995). *An introduction to positive economics 8th edition*. Oxford: Oxford University Press.

Muhammad, A., AdeelAbid, M., Aqeel, A. & Aqsa, P. (2017). Impact of monetary policy on inflation rate in Pakistan. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*.34(1):25-38.

Mukherjee, S. & Bhattacharya, R. (2011). Inflation targeting and monetary policy transmission mechanisms in emerging market economies. *IMF Working paper 229*.

Nwoko, N. M., Ihemeje, J. C. and Anumadu, E. (2016). The impact of monetary policy on the economic growth of Nigeria. *An International Multi-disciplinary Journal, Ethiopia,10(3)*,192-206.

Ogundipe, A. & Alege, P. O. (2013). Interest rate pass-through to macroeconomic variables: The Nigerian experience. *International Journal of Economics and Finance*, 5(10),18-35.

Ogunmuyiwa, M. S. & Babatunde, O. J. (2017). Monetary policy and inflation management in Nigeria: An ARDL Approach. *Osogbo Journal of Management (OJM)*, 2(3),1– 8.

Okwu, A. T., Obiakor, R. T., Falaiye, O. B. & Owolabi, S. A. (2011). Empirical analysis of the effects of monetary policy innovations on stabilization of commodity prices in Nigeria. *European Journal of Economics, Finance and Administrative Sciences*, 5(32), 64-79.

Omotosho, B. S. & Doguwa, S. I. (2013). Understanding the Dynamics of Inflation Volatility in Nigeria: A GARCH Perspective. *CBN Journal of Applied Statistics,* 3(2), 51-74.

Onuchukwu, O. & Adoghor, G. I. (2000). *Macroeconomic: Theory and applications*. Port Harcourt: Sambros Press.

Onwachukwu, C. I. (2014). Impact of monetary policy on inflation control in Nigeria. MPRA Paper *67087, University Library of Munich, Germany*.

Orubu, C. O. (1996). Anit – inflation policy in Nigeria: The past and the future. *Nigerian Journal of Economic and Social Studies*, 38(2),111-127.

Otto, G. (2011). *Minimum wage; economist allays fears of inflation*. Uniport Weekly 5 August p.2.

Otto, G. & Nenbee, S. (2011). Interest rate liberalization and private investment behaviour. *Port Harcourt Journal of Social Science*, 4(2), 88-102.

Oyakhilomen, O. & Rekwot, G. Z. (2014). The relationships of inflationary trend, agricultural productivity and economic growth in Nigeria. *Central Bank of Nigeria (CBN) Journal of Applied Statistics*, 5(1), 35-47.

Rutasitara, L. (2004). Exchange rate regimes and inflation in Tanzania. *African Economic Research Consortium (AERC) Research Paper*, (138),1-34.

Salam, M. A., Salam, S. & Feridun, M. (2006). Forecasting inflation in developing nations: The case of Pakistan. *International Research Journal of Finance and Economics*. 3, 138-159.

Sugema, I. & Bakhtiar, T. (2010). Inflation targeting in Indonesia: Trade-off and strategy. *European Journal of Economics, Finance and Administrative Sciences*, 26, 33-43.

Ujuju, L. E. & Etale, L. M. (2016). Macroeconomic analysis of the relationship between monetary policy instruments and inflation in Nigeria. *International Journal of Business and Management Review*, 4(6),31-39.