DOES MONETARY POLICY INSTRUMENT EFFECT POSITIVELY ON INFLATION DYNAMICS IN NIGERIA ECONOMY 1980 -2020?

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Abstract

This paper examined the effect of monetary policy instruments on inflation dynamics in Nigeria economy for the period 1980-2020. The main objective of the study is to; investigate whether the inflationary dynamics significantly respond to shocks from the selected monetary variable instrument in Nigerian economy. The study made used of vector error correction model (VECM) approach, unit root tests, Co-integration Test and Granger Causality. Based on the above econometric and statistic techniques conducted, it was observed that Inflationary dynamics in Nigeria dose significantly respond to shocks from the selected monetary instrumental variables. The results raveled both directional and direct nature of causality relationship between the variables in the model during the period of the study 1980-2020. Based on these findings, the researcher recommends that; the key policy implication of the findings is that the CBN should continue to factor growth in monetary aggregates in its monetary policy instrument considerations aimed at achieving price stability while keeping a keen eye on financial innovations and their impact on money supply. The literature has called the policy tool that is associated with the chosen active policy approach. Each policy approach came with a measure of effectiveness. When they are all brought together, this provides a way to compare approaches that does not rely solely on whether one finds some assumptions more convincing than others do, but can be backed with estimates of their effectiveness.

Keywords: Effect, Monetary Policy Instruments, Inflation Dynamics, Nigeria Economy

BACKGROUND TO THE STUDY

There is a consensus among economists that the main objective of macroeconomic policy is to achieve sustained economic growth in combination with low inflation. Nigeria's poor economic growth rate (as compared to the rest of the world) has become an increasingly popular area of research, in view to determine why the performance has been below expectations. The strong reliance on primary commodities for growth generation in Nigeria has often led to the country encountering negative supply shocks and volatility in the exchange rates, due to instability in Nigerian currencies, which has affected GDP growth. Monetary policy in African economies, like many other developed economies has been conducted based on an eclectic approach, which consist of exchange rate monetary policy and inflation targeting frameworks. The fixed exchange rate mechanism was the most important exchange rate arrangements used beginning from the early 1960's until the

early 1980's, to maintain price stability in Nigerian mainly commodities. This was because Nigeria is a major source of raw materials producer to the rest of the World (Ikejiaku, 2008).

The collapse of the fixed exchange rate mechanisms (Bretton Woods system) in 1973 in Nigeria led to alternative policies and programme which included both monetary and fiscal policy measures to stabilize the structure of the Nigerian economy as inflation soared above single digits, during the 1980's. The monetary targeting policies which were implemented in the 1980's through to the early-to-mid 1990's were unsuccessful for the following reasons: The instability in the money demand function as a result of the debt crises meant that it was difficult to maintain a constant rate of growth of the money supply. This is because the Nigerian economy had relied on prudential macroeconomic policy frameworks with fiscal policy dominance (Akinbobola, 2012; Mishra and Montiel, 2012). It is believed that the debt crises which accumulated through the International Monetary Fund's (IMF) and the World Bank's concessionary lending programmes had inflationary impacts on African economies as they required higher interest rates on repayments which increased fiscal deficits (Caceres et al, 2013). Secondly, monetary authorities objective for expanding financial markets in Nigeria was for the control of excess liquidity and increase in money supply resulted from Nigerian economy having attracted higher capital inflows through foreign aid allocation and investment in capital resources (Saxegaard, 2006).

Prior to the 2000's, weak domestic policies caused by structural rigidities such as government intervention in the market and external disequilibrium involving negative supply shocks led to low output growth. This was also due to limited Nigerian central bank autonomy to independently conduct monetary policy. Growth in the early 2000's coincided with strong domestic policies and growth propelled by emerging market economies such as China, who were investing in Nigeria, having been attracted by the presence of abundant natural resources. The following effects have been observed. Firstly, inflation-targeting frameworks have been introduced by central bank of Nigeria, with the aim of bringing down inflation to a single digit. Secondly; the Nigerian economy are now transitioning toward market-based instruments involving the use of the interest rate in conducting monetary policy. The debate as to whether the fiscal deficits to finance government expenditures were inflationary or whether inflation originated from depreciating exchange rates has led to different mechanisms for the appropriate response of monetary policy.

Consequently, inflation dynamics and its interactions with other economic variables are very crucial to central banks that have price stability as their core mandate. To attain this objective, central banks apply inflation targeting framework using monetary policy stance. To Lucchetti (2006), this core mandate objective prevents central banks from responding adequately to short-term price volatility.

However, importance of inflation is premised on the distortions that high inflation can exert on macroeconomic conditions, with the potential to derailing the economy from the path of sustainable growth and development. Inflation adversely affects the overall growth of the economy, more especially the financial sector development and the vulnerable poor segment of the population. It also induces uncertainty, discourages savings and investments, promotes consumption, and poses serious threat to macroeconomic stability and results in high social costs (Sani, Ismaila & Adamu, 2016).

Notwithstanding the application of monetary policy and fiscal policy, Nigeria, since the 1970s has witnessed unstable single digit inflation rates records in its economy. Adenekan and Nwanna (2004) indicated that by 1988 and 1989, inflation had skyrocketed

to more than 50 percent in Nigeria. More so, Bawa and Abdullahi (2012) opined that in spite of the fact that inflation declined to about 7.5 percent in 1990, it rose to 44.8 percent, 57.2 percent and 57 percent in 1992, 1993 and 1994, respectively. It hits 72.8 percent in 1995, then fall to 29.3 percent, 10.7 percent 7.95, 6.6 percent, 6.9 percent, in 19956, 1997, 1998, 1999 and 2000 respectively. Thus, it rise again to 18.9 percent, 12.2 percent, 14.1 percent, 15.0 percent, 17.9 percent, 8.2 percent, 5.4 percent, 11.6 percent, 12.5 percent, 13.7 percent, 10.8 percent, 12.2 percent, 8.5 percent,8.0 percent, 9.0 percent, 15.6 percent, 17.5 percent, 16.8 percent, 18.17 percent in 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009,2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019,2020, 2021.

In Nigeria, controlling inflation within acceptable rates is one of the major macroeconomic policies. To achieve macroeconomic stability, the Central Bank of Nigeria was established by the Act of 1958, and commenced operations in 1959. The act was designed to strengthen the capacity of the central bank to formulate and implement monetary policy with the purpose of pursuing price stability as the primary objective. Despite these efforts to secure price stability in the economy, the country is still experiencing dynamics in inflation rates and is yet to permanently attain the desired objective of the monetary policy of the nation (Augustine, Joseph & Richard, 2016).

It is commonly argued that high and persistent inflation rate in Nigeria has been fed by; high public sector budget deficits, monetization of public sector budget deficits, high military expenditures including the fight against terrorism attacks, political instability and populist election economy policies, high real interest rates and risk premium due to high public sector borrowing requirement, regulated prices for the public sector products such as gasoline utilities, devaluations that feed into inflation by exchange rate pass through mechanism, external shocks such as oil price increases, Persian Gulf crisis, devastating earthquakes, and persistent inflationary expectations (Augustine, Joseph & Richard, 2016).

Over the years, monetary policy variables alone may not have address the problem of inflation dynamics in Nigeria, one could address the inflation dynamics with none quantitative factors (dummy variables) such as; presence of e-money in the economy and economic and environmental crisis that causes or influences changes in the consumer price index. These economic and environmental factors are; the SAP period, April 1994 crisis, 2019-2020 Covid virus pandemic and another end SARS of February 2021 crisis in Nigeria. It is no more news that after each of these crises in Nigeria, consumer price index increases and never goes down again. Consequently, inequitable distribution of income, erosion of purchasing power, loss of social welfare and decrease in savings and investments appears to have continued to override the macroeconomic goals of Nigeria. Despites the policy thrust of policy makers in controlling inflation in the country, much has not been realized in curbing the menace of inflation rate in Nigerian economy. More so, the effects of inflation includes inequitable distribution among income earners, continuous erosion of the purchasing power of money, loss of social welfare due to price rises and decrease in savings and investments. Inflation also causes excessive price variability and misallocation of resources. It further decreases real income of labour in which nominal wages are without escalation clause. In view of these chronic effects of inflation rate on the Nigerian economy, this study wish to evaluate the effect of monetary policy instrument on inflation dynamics in Nigeria. Therefore the main objective of this paper is to investigate whether the inflationary dynamics significantly impact respond to shocks from the selected monetary variables (Chigbu, and Njoku, (2013).

THEORETICAL LITERATURE REVIEW

There are two basic Schools of thoughts, namely; the monetarists and the Keynesians, which explain the influence of monetary policy variable instrument upon which inflation rate interact with the macroeconomic variable in an economy. These however, have generated serious debate among scholars as to which of the policies (fiscal or monetary policy) is more desirable in achieving inflation targets of a nation. This debate therefore, is broadly evident in the controversies that have ensued between the monetarists and the fiscalists about the rightful policy option required to better influence economic activities of nations (Ogar, Nkamare & Emori, 2014). The theories discussed under these school of thought include the postulations evolved from the contributions of some economic scholars such as Adam Smith, David Ricardo, Pigou, Jean Baptist Say, Jean Bodin, John Stuart Mill, David Hume, Irving Fisher, Cambridge, Milton Friedman, Keynes, among others. For the purpose of this research, the Study is set to review the following theories, namely; Irving Fisher, Cambridge, Friedman and Keynes monetary theories. This is because, though other scholars contributed immensely to the evolution or development of the monetary theories, the above-considered theories are the clearest exposition of the monetary theories.

The monetarists upheld that free market economy has strong self-adjustment tendencies. If a favourable climatic environment is maintained, the economy tends naturally toward a relative stable price level and full (Chigbu and Njoku, 2013). They argued that private initiative, which is by profit motive, yields a satisfactory real national income growth. However, any attempt by government to stabilize the economy via fiscal policy will often be perverse that in turn, leads to economic recession on the downward side and higher inflation on the upward side as against when government has passive role. Thus, the monetarists were of the opinion that while government tries to stabilize the economy, the fiscal policy of government should take a passive stance. The fiscal stance should be one of low and stable government expenditure and a budget that is balanced cyclically if not annually. The monetary stance should be one of a three percent increase in money supply, to accommodate the increase in demand for money associated with a growth of wealth and full employment of income. It is when this happened that the natural corrective forces of the economy can be relied upon to prevent serious recession alongside serious inflation. The monetarists treated money as exogenous variable.

Fisher's quantity theory of money began in 1911 with his publication of the book titled, "The Purchasing Power of Money" in the 19th century. In quantity theory of money, Irving Fisher postulated that the quantity of money is the key determinant of the value of money or the price level. A change in the quantity of money in circulation will result to a proportionate change in the price level of goods in the economy (Farah and Ishtiaq, 2016).

Accordingly, the demand for money is necessitated with the view that goods and services have to be exchanged for it. Essentially, money demand is made mainly for transaction purposes. The demand for money is not made for its own sake but for the sake of the things it would help to buy. Money demand equates the aggregate value of all the transactions of goods and services in the economy during a specific period. Fisher used equation of exchange to demonstrate his quantity theory of money believing that transactions demand for money results from the velocity of money in circulation. According to him, money acts as a medium of exchange and therefore, it facilitates the exchange of goods and services in the economy. Fisher expressed his equation of exchange thus:

$$MV = PT \qquad\qquad\qquad\qquad\qquad 1$$

Where; M is the quantity of money, V is the velocity of money in circulation, P is the price of goods and services while T is the quantity of goods and services traded at any given year. The equation of exchange stated that quantity of money multiplied by the velocity of money in circulation (MV) is equal to the nominal income (PT), so that when the quantity of money changes, the nominal income changes in the same direction. To convert the equation of exchange into a theory of nominal income, a better understanding of the factors that determine velocity is required. To Irving Fisher, velocity is determined by institutions in the economy that affect the way individuals conducts in their transactions behaviours

While Irving Fisher looked into money solely at the level of transactions and the institutions that affect the way people conduct transactions as the key determinant of the demand for money, in the Cambridge model, individuals are allowed of some flexibility in their decision to hold money and not completely banned by institutional constraint such as the use of credit card to make purchases. The store of value function of money laid more emphasis on the decision by the people to hold money as a purchasing power over a period of time for the reason of sales of goods and services as well as buy goods and services at later date. Thus, in laying more emphasis on the factors that determine people's decision in the demand for holding cash balances, the classical Cambridge economists agreed with Fisher that interest rate, individual's wealth expectations and future prices determine the demand for money. However, they added that people demand for money because of its utility as a mechanism for exchange as well as its utility as a store of wealth or value. They believe that changes in these factors remain constant or they are proportional to changes in people's nominal income.

Keynes in his liquidity preference theory abandoned the classical economists' viewpoint that assumed velocity as being constant and laid more emphasis on the importance of interest rate. Keynes postulated that there exist three motives for money demand. He identified these three motives for money demand to include transaction motive, precautionary motive and speculative motive.

To Keynes, the transaction demand for money arises when there is lack of synchronization of receipt and disbursement, which are determined primarily by the level of people's transactions. In other words, people are not likely to get paid at the exact time, but would want to conduct transactions. Between the pay cheques, people would want to keep some money around them in order to buy foodstuff, pay their transport fare to work and conduct other daily business transactions. In the precautionary motive for money demand, Keynes recognized that people hold money not only for current transaction purposes but also to take care of unexpected needs such as sudden sickness, death of a relative, accident and other unforeseen circumstances. Keynes also discussed the speculative motive for holding money balances. All along the discussions on the transaction motive and the precautionary motive for money demand are all focused on the medium of exchange function of money because each of the discussion refers to the need to have cash balance at hand to make payments. Meanwhile, Keynes agreed with the classical Cambridge economists that money function as a store of wealth or value, and this reason for holding money, he calls the speculative motive for money demand. He considered that wealth is tied closely to income.

EMPIRICAL LITERATURE REVIEW

Ojeah, Nwogwugwu and Ozoh (2020), investigated the determinants of inflation dynamics in Nigeria for the period 1982-2016, using unit root test, ordinary least square (OLS) technique, ARDL bounds testing approach to cointegration and Vector Autoregressive (VAR) techniques to ascertain if inflation is only a monetary phenomenon in Nigeria. The variables employed in the research include inflation, exchange rate, interest rate, unemployment, real gross domestic product. The results of the unit root test conducted showed mixed order integration among the variables. The results of the estimation revealed that inflation is not only a monetary phenomenon by the statistical significance of exchange rate and real gross domestic product in both the short-run and long-run; and unemployment and interest rate in the long-run.

Sina, Ansgar and Thomas (2020), examined the effects of the unconventional monetary policy on inflation expectations in the Euro area as inflation expectations play a key role for achieving the inflation target of below, but close to 2 percent. Quantifying the impact of unconventional monetary policy is not straightforward, as standard empirical tools such as VAR cannot be applied. Thus, the study used the Qual VAR approach developed in 2005 by Dueker to overcome this problem. The results showed that unconventional monetary policy leads to an increase in inflation expectations in the short-run but that this effect appeared to evaporate in the medium- term. The results put some doubt on the common claims that unconventional monetary policy has consistently contributed to a re-anchoring and a stabilization of inflation expectations at the zero lower bound.

Ibrahim and Ifuero (2020) empirically developed a multivariate autoregressive distributed-lag (ARDL) model and a univariate autoregressive integrated moving average (ARIMA) model for inflation in Nigeria, ascertained the stability of the models, and compared the performance of the models. This investigation employed quarterly time series data ranging from 1988Qi to 2017Qi. The variables analyzed in the investigation include inflation, broad money supply, exchange rate, and interest rate. The stationarity test conducted revealed that all the variables became stationary after first differencing. Estimation results indicated that inflation in Nigeria was largely expectations-driven. More so, the results showed that exchange rate, interest rate, and broad money supply had significant influence on inflation in Nigeria both in the short-run and in the long-run. Thus, study recommended the regulatory authorities should ensure a high degree of transparency in monetary policy making and implementation. More so, efforts should be made by the regulatory authorities to control money supply and ensure exchange rate and interest stability, in order to stem inflationary tendencies in the economy.

Bhavesh and Anuradha (2019), estimated various specifications of the New Keynesian Phillips Curve (NKPC) models for India over 1996Q2 to 2017Q2 using Consumer Price Index and Wholesale Price Index inflation, separately. The results showed that the data support all the specifications of the Phillips curve models based on both the consumer price index and wholesale price index inflations. However, the backward looking and hybrid models provide robust results for both the inflation indices. While the forward-looking behaviour dominates the CPI inflation trajectory, the backward-looking behaviour greatly influences the trajectory of WPI inflation.

Usman and Aliyu (2019), estimated a nonlinear augmented New Keynesian Philips Curve for Nigeria using the Smooth Transition Regression model for the period 1995Q1-

2018Q2. The variables specified for the investigation include firm's marginal cost, food inflation, energy inflation, inflation imported to domestic economy, and exchange rate. The results estimated revealed the existence of two inflation regimes during the period of the study. Food inflation, energy inflation, firms' marginal cost, and imported inflation account for most of the changes in the prices of composite consumers' basket in low exchange rate depreciation regime.

Tonprebofa (2019), evaluated the dynamics of monetary policy and inflation in Nigeria for the period 2009-2017, using the Augmented Dickey-Fuller (ADF) unit root test, Johansen Cointegration test and Error Correction model (ECM). The variables utilized in the study include inflation rate, money supply, exchange rate, monetary policy rate, monthly treasury bills, reserve requirement, and liquidity ratio. The results of the ADF indicated that except for money supply and exchange rate that were integrated at second differencing, all other variables were found to be stationary at first differencing.

Hapanyengwi, Mutongi and Nyoni (2019), utilized annual time series data on inflation rates in the Kingdom of Eswatini for the period 1966-2017, to model and forecast inflation using the Box-Jenkins ARIMA technique. The study presented the ARIMA (0, 1, 1) model for predicting inflation in the Kingdom of Eswatini. The results indicated that inflation in the Kingdom of Eswatini is likely to continue an upwards trajectory in the next decade. The study encourages policy makers to make use of tight monetary and fiscal policy measures in order to control inflation in the Kingdom of Eswatini.

Adodo, Akindutire and Ogunyemi (2018), examined the effectiveness of monetary policy and control of inflation in Nigeria, through the applications of the Co-integration approach. The variables employed in the study include inflation rate, money supply, interest rate and exchange rate. The unit root test conducted indicated money supply, inflation rate, exchange rate and interest rate non-stationary at level, and however, became stationary after first differencing. The results of the co-integration test showed evidence of long-run equilibrium relationship among the variables. The Error Correction Model (ECM) revealed that money supply and interest rate have significant effect on inflation rate variation whereas exchange rate has an insignificant influence on inflation rate in the economy.

Tekam (2018) examined the effect of monetary policy on inflation in Cameroon for the period from 1980 to 2016, using unit root test, Johansen cointegration test, auto-regressive distributed lag model and Toda-Yamamoto approach to Granger Causality test. The variables used in the study include inflation, and money supply. The unit test conducted showed mixed order of integration among the variables. The results showed evidence of long-run equilibrium relationship between the money supply and inflation. The results also indicated that money supply had a positive and significant effect on inflation in Cameroon, and there is unidirectional causality between the variables with causality run from money supply to inflation. Umar (2018) examined the relationship existing exchange rate and disaggregate consumer prices in Nigeria for the period from 1976 to 2015 through the applications of unit root test, Autoregressive Distributed Lag (ARDL) model, FMOLS and DOLS estimators. The variables employed in the investigation include consumer price index, food price, tobacco price, accommodation price, household price, clothing price, transport price, oil price, exchange rate, gross domestic products, and money supply. The results of the unit root test conducted showed mixed order of integration among the variables. The ARDL bound test discloses that there is a long-run relationship among the variables. The

long-run results indicate that exchange rate is the significant factor influencing consumer prices in all the disaggregate models.

METHODOLOGY

For this study, Ex Post Facto Research Design fits perfectly. This is because the study attempts to explore cause and affect relationships where cause already exist and cannot be manipulated, but rather to use what already exist and look backwards to explain why. In the study, the economies of Nigeria were examined with reference to; "effect of monetary policy instrument on inflation dynamism in Nigeria 1980-2020".

Theoretical Framework

The study adopts quantity theory of money as the theoretical framework guiding this research. The theory conceived that the general price level rises in proportion to the increase in money supply. It further emphasizes the role of money in the economy and however, ignores the real or non-monetary factors causing inflation (Friedman, 1956). Thus, the quantity theory of money conceived inflation as a monetary event resulting from the monetary expansion due to the monetary policy rate. Therefore, there is relationship between money supply and price level. This relationship is determined through Fisher[4]s equation of exchange.

Model Specification

The theoretical framework of this model specification is anchored on the quantity theory of money framework as adopted by Tekam (2018). The quantity theory of money explains that the amount of money supply multiply by number of times money changes hand, is equal to price of goods multiply by quantity of goods. Thus:

Following the Tekam, (2018) model, inflation is expressed as a function of money supply and interest rate. The model is illustrated as: $INF = MS + INR + U_t$

However, we modified this model to suit in our present study which includes as follows:

$$CPI = f(MS, INR, EXR, GEX, SEC\ PEM)$$

Where; CPI is the consumer price index, Money supply (MS), interest rate INR, Exchange rate (EXR), Government expenditure (GEX), influence of technology E-mobile banking (PEM), Social and environmental crisis (SEC) that causes changes in inflation rate which represented the monthly percentage change of the consumer price index a dummy for the SAP period, April 1994 crisis, 2019-2020 Coivd-19 various pandemic and another Special Anti-Robbery Squad end SARS of February 2021 crisis). In linear function, the relationship is specified thus:

$$CPI_t = \beta_o + \beta_1 MS_t + \beta_2 INR_t + \beta_3 EXR_t + \beta_4 GEX_t + \beta_5 SEC_t + \beta_6 PEM_t + \mu_{it}$$

Dummy variable specification for SEC and PEM

$E(\Delta log\ (CPI)_t \backslash D_{1i} = 0, D_{1j} = 1) = \beta_0 + \beta_5$; Where D_1 takes a value of 1 with the present of the SAP period, April 1994 crisis, 2019-2020 Coivd-19 various pandemic and another ENDSARS of February 2021 crisis in Nigeria, and 0 otherwise. (i.e. $D_{1j} = 0$ implies the value of D_{1i} in the absent of the influence of SAP period, April 1994 crisis, 2019-2020 Coivd-19 various pandemic and another end SARS of February 2021 crisis in Nigeria. $E(\Delta log\ (CPI)_t \backslash D_{1i} = 0, D_{1j} = 1) = \beta_0 + \beta_6$;   Where D_1 takes a value of 1 with the influence technology E-mobile banking in Nigeria, and 0 otherwise. (i.e. $D_{1j} = 0$ implies the value of D_{1i} in the absent of the presence of technology e-money banking in Nigeria.

Where; CPI is the explained variable; whereas logMS, INR, logEXR, logGEX, logSEC and logGEX are the explanatory variables; ε_t is error term; β_0 = constant term; log is the log function of the equations, whereas β_s are the coefficients of the regression equation.

We employ **Vector Error Correction Model (VECM)**

$$\Delta CPI_t = \sum_{k=l} \lambda_k v_{kt-1} + \sum_{s=l} \alpha_{1,s} \Delta CPI_{t-s} + \sum_{S=l} \alpha_{2,s} \Delta MS_{t-s} + \sum_{s=l} \alpha_{3,s} \Delta INR_{t-s} + \sum_{s=l} \alpha_{4,s} \Delta EXR_{t-s} + \sum_{s=l} \alpha_{5,s} \Delta GEX_{t-s} + \sum_{s=l}^{p} \alpha_{6,s} \Delta SEC_t + \sum_{s=l}^{p} \alpha_{7,s} \Delta PEM_t + \zeta_{1,t} \quad \dots (3.20a)$$

$$\Delta MS_t = \sum_{k=l} \lambda_k v_{kt-1} + \sum_{s=l}^{p} \beta_{1,s} \Delta CPI_{t-s} + \sum_{S=l}^{p} \beta_{2,s} \Delta MS_{t-s} + \sum_{s=l}^{p} \beta_{3,s} \Delta INR_{t-s} + \sum \beta_{4,s} \Delta EXR_{t-s} + \sum_{s=l}^{p} \beta_{5,s} \Delta GEX_{t-s} + \sum_{s=l}^{p} \beta_{6,s} \Delta SEC_t + \sum_{s=l}^{p} \beta_{7,s} \Delta PEM_t + \zeta_{2,t} \quad \dots (3.20b)$$

$$\Delta INS_t = \sum_{k=l}^{r} \lambda_k v_{kt-1} + \sum_{s=l}^{p} \delta_{1,s} \Delta CPI_{t-s} + \sum_{S=l}^{p} \delta_{2,s} \Delta MS_{t-s} + \sum_{s=l} \delta_{3,s} \Delta INR_{t-s} + \sum_{s=l}^{p} \delta_{4,s} \Delta EXR_{t-s} + \sum_{s=l}^{p} \delta_{5,s} \Delta GEX_{t-s} + \sum_{s=l} \delta_{6,s} \Delta SEC_t + \sum_{s=l} \delta_{7,s} \Delta PEM_t + \zeta_{3,t} \quad \dots (3.20c)$$

$$\Delta EXR_t = \sum_{k=l} \lambda_k v_{kt-1} + \sum_{s=l}^{p} d_{1,s} \Delta CPI_{t-s} + \sum d_{2,s}^{p} \Delta MS_{t-s} + \sum d_{3,s}^{p} \Delta INR_{t-s} + \sum d_{4,s} \Delta EXR_{t-s}^{p} + \sum_{s=l} d_{5,s}^{p} \Delta GEX_{t-s} + \sum_{s=l}^{p} d_{6,s} \Delta SEC_t + \sum_{s=l}^{p} \alpha_{7,s} \Delta PEM_t + \zeta_{4,t} \quad \dots (3.20d)$$

$$\Delta SEC_t = \sum_{k=l} \lambda_k v_{kt-1} + \sum_{s=l}^{p} \delta_{1,s} \Delta CPI_{t-s} + \sum_{s=l} \delta_{2,s}^{p} \Delta MS_{t-s} + \sum_{s=l} \delta_{3,s} \Delta INR_{t-s}^{p} + \sum \delta_{4,s} \Delta EXR_{t-s} + \sum_{s=l}^{p} \delta_{5,s} \Delta GEX_{t-s} + \sum_{s=l}^{p} \delta_{6,s} \Delta SE_t + \sum_{s=l}^{p} \alpha_{7,s} \Delta PEM_t + \zeta_{5,t} \quad (3.20e)$$

Where $n_{k,t-1}$ represents residuals from the cointegrating equations and l_k are the adjustment coefficients while r and p are respective optimal lag lengths, and z_{it} are errors assumed to be white noise.

Impulse response analysis in VEC models with near unit roots identified by long-run restrictions.

Impulse response analysis of VEC models with near unit roots identified by long-run restrictions model for which:

CPI$_t$ = (**ΔCPI**$_t$; U$_t$). Interest rate INR, exchange rate EXR, GEX is the government expenditure, influence of technology E-mobile banking (PEM) and social and environmental/political crisis like Covid19 and ENDSARS Crisis (SEC). Where **CPI**$_t$ is the Nigeria consumer price index and U$_t$ is the is the stock of Money supply, $A(MS) = \lambda(\mathbf{CPI})^{-1} (INRI_2 \, \gamma EXR \, \dots \, SEC)$

and $\beta_0 = \begin{bmatrix} 1 & -b_{12}^{(0)} \\ -b_{12}^{(0)} & 1 \end{bmatrix}$

The structural shocks $\varepsilon_t = \beta_0 e_t$ can be interpreted as consumer price index (**CPI**), Interest rate INR, exchange rate EXR, GEX is the government expenditure, influence of technology E-mobile banking (PEM) and social and environmental/political crisis like Covid19 and ENDSARS Crisis (SEC) = (ε^s_t, ε^d_t). The long-run identifying restriction that the demand shocks ε^d_t have no long-run effect on output imposes a lower triangular structure on the moving average matrix $A(1)^{-1}B_0^{-1}$. Hence, under this identifying restriction, the matrix of long-run multipliers in the structural VEC model, $B(1) = B_0A(1)$; is also lower triangular.

Estimation Procedures

Standard econometric approaches are utilized in the investigation of the impact of monetary policy variables on inflation dynamics in Nigeria. These econometric approaches include the unit root test via the Augmented Dickey-Fuller (ADF) stationarity test, Vector Error Correction Model (VECM), Chow structural test and Granger Causality test.

Sources of Data

Time series data is used in this study to achieve empirical results on the impact of monetary policy variables on inflation dynamics in Nigeria for the period 1986-2020. The variables used in the investigation include consumer price index, broad money supply, interest rate, exchange rate, and government expenditure. Data on these variables are obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin, 2020.

PRESENTATION OF RESULTS AND ANALYSIS

Unit Root Test

The results of the Augmented Dickey Fuller (ADF) test is presented in table 4.1a below. A variable is said to be stationary if the computed ADF is greater than the critical ADF at chosen level of significance.

Table 1a: Unit Root Test at Trend and Intercept

Variables	Computed ADF @ level	Critical ADF at 5%	Remarks	Computed ADF @ 1st Difference	Order of Integration	Remarks
CPI	2.502604	3.526609	Non-Stationary	6.643276	I(1)	Stationary
MS	2.930383	3.526609	Non-Stationary	7.235652	I(1)	Stationary
EXR	0.429912	3.526609	Non-Stationary	4.296525	I(1)	Stationary
INR	2.721732	3.526609	Non-Stationary	6.154944	I(1)	Stationary
SEC	1.821519	3.526609	Non-Stationary	6.055467	I(1)	Stationary
PEM	1.648763	3.526609	Non-Stationary	5.905768	I(1)	Stationary
GEX	1.810491	3.526609	Non-Stationary	6.945287	I(1)	Stationary

Source: *Researcher's Estimate from Eview 9.0 (2021).*

From the results, these variables Consumer price index (CPI) Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM), and Social and environmental crisis that causes changes in inflation rate (SEC) were not stationary in levels and hence was not integrated of order zero i(0) since their critical ADF were less than the 5% level of significance. These variables were therefore subjected to first order difference. Having test for the first order difference, the results show that all the variables were stationary in first order difference. This means that Consumer price index (CPI) Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM), and Social and environmental crisis that causes changes in inflation rate

(SEC) are integrated of order one i(1) since their critical ADF were greater than the 5% level of significance.

Generally, the results indicated that the time series used are integrated of order one. The integration of group variables at the same order with the respective application (ADF), thus implies a linear combination of series which could be said to be co-integrated. The level of their integrations indicates the number of time series have to be differenced before their stationarity is induced. Considering the ADF test statistics at 5% critical values, it is observed that these tests (i.e. the t- statistics) are strong. Based on the above results, we can now further the other estimations model since the problem of spurious results has been adjusted with the aid of ADF unit root test. Having found that all the variables are integrated of order one co-integration tests are conducted to see if there is a long run or equilibrium relationship between the variables.

Co-integration Test

The co-integration test was conducted to ascertain if a long-run relationship exists among the variables in the model. The result of the unit root test show that some variables were not stationary in levels while all the variables were stationary in first order difference. This clearly shows that all the variables were integrated of the same order. In this case, the popular Johansen co-integration method will be applicable since the variables were integrated in the same order. The Johansen co-integration test is more suitable in cases like this (Gujarati, 2004). The result is shown in table 4.2 below;

Johansen co-integration Test
Series: D(CPI,2) D(EXR,2) D(GEX,2) D(PEM,2) D(MS,2) D(SEC,2)
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.931716	288.1783	95.75366	0.0000
At most 1 *	0.851917	188.8673	69.81889	0.0000
At most 2 *	0.695054	118.1979	47.85613	0.0000
At most 3 *	0.624653	74.25597	29.79707	0.0000
At most 4 *	0.561708	37.99954	15.49471	0.0000
At most 5 *	0.183023	7.479333	3.841466	0.0062

Source: Researcher's Estimate from Eview 9.0 (2021).

Judging by the Trace – statistic, Max-Eigen statistic and its corresponding probability value in Johansen co-integration test, there are at least six co-integrating equations in table 4.2 above. This means that the variables[Consumer price index (CPI) Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM), and Social and Environmental Crisis that causes changes in inflation rate (SEC)] are co-integrated and it can be concluded that a long-run equilibrium relationship exists among the variables.

Vector Error Correction Estimates Results

	Cointegrating Eq: CointEql	D(kg(-1))	D(lag(-2))				
D(CPI(-1),2)	1.000000	(0.30077)	[2.38963]				
		[-1.475301					
D(EXR(-1),2)	0.280474	-7948513.	-0.172003				
	(0.04655)	(1548611)	(0.25945)				
	[6.025851	[-5.132671	[-0.662961				
D(GEX(-1),2)	0.000378	-0.793624	-0.434406				
	(4.2E-05)	(0.27491)	(0.21322)				
	[9.044531	[-2.886811	[-2.037401				
D(PEM(-1),2)	-1.28E-08	-0.456320	-0.380006				
	(7.9E-09)	(0.16683)	(0.21322)				
	[-5.406721	[-2.735191	[-1.782221				
D(MS(-1).2)	0.004490	-1.742057	-1.214499				
	(0.00154)	(0.27170)	(0.25023)				
	[2.918041	[-6.411701	[-4.853511				
D(INR(-1),2)	-0.449446	-1.309934	-0.728263				
	(0.23145)	(0.16261)	(0.14964)				
	[-1.941881	[-8.055511	[-4.866611				
D(SEC(-1),2)	1.818439	-0.641236	-0.191999				
	(2.30891)	(0.18701)	(0.16641)				
	[0.787571	[-3.428801	[-1.153771				
C	0.022400	0.471470	-792.6244	13867925	111.7549	-0.134048	0.025749
	(1.81130)	(5.22875)	(4752.12)	(2.6E+07)	[0.86712]	(1.01502)	(0.07070)
	[0.012371	[0.090171	[-0.166791	[0.529131	[0.867121	[-.132061	[0.364191
R-squared	0.906068	0.758486	0.789972	0.937501	0.959009	0.884749	0.805631
Adi. R-squared	0.835619	0.577351	0.632450	0.890627	0.928267	0.798312	0.659855
Sum sq. resids	2296.263	19135.31	1.58E+10	4.81E+17	11625593	721.0926	3.498639
S.E. equation	10.71509	30.93163	28112.01	1.55E+08	762.4170	6.004551	0.418249
F-statistic	12.86130	4.187398	5.015017	20.00037	31.19449	10.23567	5.526477
Log likelihood	-125.8811	-164.0457	-409.2839	-719.4335	-279.4154	-105.0323	-9.121178
AkaikeAIC	7.882285	10.00254	23.62688	40.85742	16.41197	6.724015	1.395621
Schwarz SC	8.586071	10.70632	24.33067	41.56120	17.11575	7.427801	2.099407
Mean dependent	0.696166	1.107456	4.226710	9758816.	183.8089	-0.117701	0.000000
S.D. dependent	26.42831	47.57871	46369.66	4.69E+08	2846.634	13.37026	0.717137

Source: Researcher's Estimate from Eview 9.0 (2021).

The table presented these variables; Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM), and Social and environmental crisis that causes changes in inflation rate (SEC) on the dependent Consumer price index (CPI).The table is divided into two; the upper side of the table represents the short run estimate equation without error correction value while the lower parts of the table represent the long run estimate equation with error correction estimation value.

The short run coefficient of the Victor Error Correction Mechanism (VECM) regression presented in table 4.4 above, shows that coefficient of Presence of technology e-money banking (PEM) and interest rate at lag one had a negative impact relationship on Consumer price index (CPI). This implies that increase in volume, value charges of the Presence of technology e-money banking (PEM) variable will lead to decrease in Consumer price index (CPI) at short run in Nigeria by [-4.28E-08PEM and -0.449446INR] with the t-

statistic value [-4.28E-08PEM and -0.449446INR] at 5% level of significance respectively, during the periods of the study.

The short run coefficients of Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX) and Social and environmental crisis that causes changes in inflation rate (SEC) at lag one showed positive relationship with Consumer price index (CPI). This implies that increase in value and volume charges of these variables [Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX) and Social and environmental crisis that causes changes in inflation rate (SEC)] will lead increases on Consumer price index (CPI) at the short run in Nigeria by [0.280474EXR, 0.000378GEX, 0.004490MS and 1.818439SEC] at 5% level of significance respectively, during the periods of the study.

Moreover, the result further shows that the sign of the value of co-integration coefficient also known as Error Correction Mechanism (ECM) was negative and statistically significant. On the other hand, the value of ECM constant value [-0.900638] being negative and statistically significant is an indication of the presence of cointegration or long run relationship existing from monetary variables used. The result of the error correction transmission indicates that it will take the value of 9 year for the model to adjust back to the long run equilibrium after a shock in the short run. The sign borne by the short run parameter estimates of β_1 to β_5, are in conformity with the economic a priori expectation.

Meanwhile, the long run estimate equation shows that the coefficients of Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM), and Social and environmental crisis that causes changes in inflation rate (SEC) both at lag one and two, had a negative impact relationship on Consumer price index (CPI). This implies that increase in volume and value charges of these variables will lead to decrease in Consumer price index (CPI) in Nigeria under the period of the study by [0.172003EXR(-2) -0.793624GEX(-1) -0.434406GEX(-2), 0.456320PEM(-1) -0.380006PEM(-2) -1.742057MS(-1) -1.214499MS(-2) -1.309934INR(-1) - 0.728263INR(-2) -0.641236SEC(-1) -0.191999SEM(-2)] respectively.

The result further disclosed as thus:

- One percent decrease in Money supply (MS) and Interest rate (INR) will leads to a decrease in Consumer price index (CPI) by [2%MS, 1%INR] at lag one (-1) and [2%MS, and 7%INR] at lag two (-2) respectively during the period of the study.

- One percent decrease in Exchange rate (EXR) and Government expenditure (GEX) at lag one (-1) and two (-2) will leads to [17%EXR, 7%GEX(-1) and 4%GEX(-2)] decrease in Consumer price index (CPI) respectively in Nigeria during the period of the study.

- Whereas, one percent decrease in Presence of technology e-money banking (PEM), and Social and environmental crisis that causes changes in inflation rate (SEC) at lag one (-1) and two (-2) of the same long run equation, will lead to 0.36% increase in Consumer price index (CPI) respectively in Nigeria during the periods of the study.

The fact is that the ECM long run constant variable shows negative. This implies that if Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM), and Social and environmental crisis that causes changes in inflation rate (SEC) in Nigeria being held constant, then, the Nigerian Consumer price index (CPI) will in the long-run will stand at by 0.9% within the period of the study 1980 to 2020.

T-test: In short run equation, all the coefficients variable employed in the model were all statistically significant at 5% level of significance using the calculated t-value of the model. In other words, form the short run regression estimate of the variables [MS, EXR, INR, SEC PEM and GEX] were [6.02585EXR, 9.04453GEX, 5.40672PEM, 2.91804MS 1.94188INR] respectively. The tabulated t- value is 1.569. Thus, the t-calculated results shows all the independent variables statistically significant at lag one (-1) because their t-calculated value were greater than the tabulated t-value1.569 at 5% level of significance. While, at long run, the t-statistic of the variables are [2.88681GEX(-1)   2.03740GEX(-2) 2.73519PEM(-1)   1.78222PEM(-2)   6.41170MS(-14.85351MS(-2) 8.05551INR(-1) [-4.86661INR(-2) [-3.42880SEM(-1)]
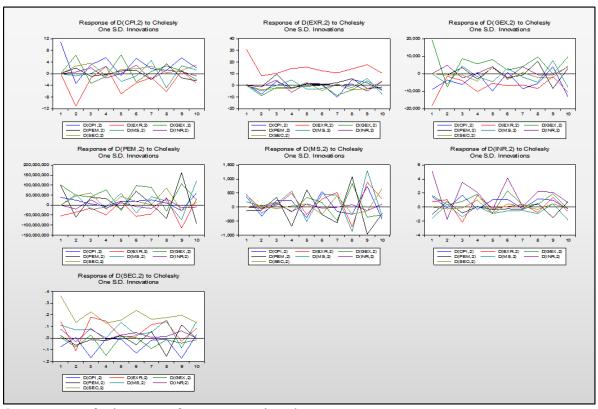
F-Test: This is used to test for the joint influence of the explanatory variables (i.e. [MS, EXR, INR, SEC PEM and GEX] on the dependent variable [i.e. Consumer price index (CPI)]. Thus, the $F_{-calculated}$ value stood at [12.86130] while the $F_{-tabulated}$ value is 3.32 at 5% level of significance. Since the $F_{-calculated}$ 3.32% value is greater than the $F_{-tabulated}$ value 3%, we then concluded that the regression plane is statistically significant. In other words, it means that the joint influence of all the explanatory variables [MS, EXR, INR, SEC PEM and GEX] on the dependent variable [i.e. Consumer price index (CPI)] is statistically significant.

Coefficient of Multiple Determinations (R^2)

The computed coefficient of adjusted determination (R^2 = 0.835619) implies that 83% of the total variations in the dependent variable Consumer price index (CPI)   in the long run is influenced by the variation in the explanatory variables namely; Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM) and Social and environmental crisis that causes changes in inflation rate (SEC). While other remaining 27% out of the total one hundred variations in the dependent variable is accounted to the other factors not included in the model, and have been captured by the error term in the regression model. Based on the R^2 value, we could conclude that our linear regression model has good fit.

Impulse Response Functions Result

Having confirmed the existence of unit root and co-integration in the series and following the debates about advantages and drawbacks of different VEC specifications, we then proceed to estimate an unrestricted VEC system in first differences with two lags of each variable of the three equations. The study demonstrated the advantages of unrestricted VEC by examining impulse response functions in cointegrated systems.

Source: *Researcher's Estimate from Eview 9.0 (2021)*

Figure 1 displays the impulse response functions of the log of first differences of the variables (Consumer price index (CPI) Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM) and Social and environmental crisis that causes changes in inflation rate (SEC) to one standard deviation structural shocks. The combined graphs are based on the output of the unrestricted VEC with analytic response standard error over 10 periods and Cholesky degrees of freedom adjusted, which show the response to Chelosky one standard deviation innovation. Each graph as shown in plots in Figure 1 includes a point estimation of impulse response functions as well as lower and upper bounds for a 95% confidence interval. As usual, the solid lines depict the variable percent change in response to a standard deviation of one in the respective employed variable whereas the dotted lines represent the 95% error bands.

The graph Consumer price index (CPI), Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM) and Social and environmental crisis that causes changes in inflation rate (SEC) are consistent and positive which implies that the equations are stable since [MS, EXR, INR, SEC PEM and GEX] response on Consumer price index (CPI) sloes all decline to zero. This also means that shock and short-run values of the variables in question converge to the long-run equilibrium values. It shows also a persistent over the time horizons, since it lies within the bounds line of the 95% confidence interval. The [MS, EXR, INR, SEC PEM and GEX] response graphs lines tock similar direction. They all starts first by causing the deviation between the short-run equilibrium values of Consumer price index (CPI) to rise, but after an unanticipated decreases in [MS, EXR, INR, SEC PEM and GEX] declined to zero and remains within the bounds line of the 95% confidence interval.

From the results we have observed that impulse response functions we employed produce the time path of the dependent variables in the VEC, shocks from all the

explanatory variables, proved that the system of equations is stable, while the shocks from all the explanatory variables declined to zero. We then conclude that the short-run values of the variables in question converge to the long-run equilibrium values.

Test of Hypothesis

Inflationary dynamics in Nigeria dose not significantly respond to shocks from the selected monetary variables instruments within the period of the study.

The objective, hypothesis two of this study was tested using Impulse response and variance decomposition analysis in VECM models procedures.

From the results we have observed that impulse response functions we employed produce the time path of the dependent variables in the VEC, shocks from all the explanatory variables, proved that the system of equations is stable, while the shocks from all the explanatory variables declined to zero. We then conclude that the short-run values of the variables in question converge to the long-run equilibrium values.

Based on the finding, we reject the null hypothesis two of this study and accept the alternative hypothesis that said, "Inflationary dynamics in Nigeria dose significantly respond to shocks from the selected monetary variables instrument employed in the study within the period of observation 1980 to 2020".

Conclusion

The study investigates on the effect of monetary policy variables on inflation dynamics in Nigeria, 1980 2020 period. Generally, we observed that the monetary policy variables namely; Money supply (MS), Interest rate (INR), Exchange rate (EXR), Government expenditure (GEX), Presence of technology e-money banking (PEM) and Social and environmental crisis that causes changes in inflation rate (SEC) has positive effect both at short and long-run on inflation dynamics in Nigerian economy within the period under review.

Overall, these results imply the existence of some relationship between the monetary aggregates and inflation, but this relationship has weakened in recent years. The diminishing strength of the relationship between money and prices may be explained in part by recent developments in the Nigerian financial system. New products and asset classes are seemingly starting to affect the demand for both money and traditional asset classes. This is not unexpected judging by the experiences of other countries like Australia and USA as noted in the review of literature.

It needs to be stressed, however, that the absence of a statistically significant relationship in the second sub-sample (2000-2020) does not imply a disconnect between money and prices, giving the long-run equilibrium relationship between them. Rather, it points to some underlying dynamics and complexities arising from recent developments in the economy such as the expansion of e-money and financial products and assets. In which case, the developments have to be seen as transitory or temporary.

Consequently, based on the results obtained and interpreted in section four, the null hypothesis, was rejected. We therefore conclude that these monetary policy variables employed in this study, despite the presence of Social and environmental crisis, Covid-19 pandemic that causes changes in inflation rate (SEC) and other external factors of which its primary product of; reduction in disposable income and unstable value of the Nigerian currency, in the Nigeria economic system) when compared with other developed countries. Thus, given the prevailing policy environment in Nigeria, these explanatory variables, has

significantly affected and did show that inflation dynamics response to shock from monetary policy variables instrument in Nigeria.

Policy Recommendations

Consequent upon the researcher's findings, the following recommendations are presented:

- The key policy implication of the findings is that the CBN should continue to factor growth in monetary aggregates in its monetary policy considerations aimed at achieving price stability while keeping a keen eye on financial innovations and their impact on money supply.

- The literature has called the policy tool that is associated with the chosen policy approach the active one. The others are passive. Therefore, if the central bank chooses an approach setting interest rates, then interest rate policy is active, while currency printing, the fiscal revenues of the central bank, and the exchange rate are all-passive.

Each policy approach came with a measure of effectiveness. When they are all brought together, this provides a way to compare approaches that does not rely solely on whether one finds some assumptions more convincing than others do, but can be backed with estimates of their effectiveness. Central banks can control inflation.

References

Adenekan, A.T., & Nwanna, G.A. (2004). Inflation dynamics in a developing: An error correction approach. *African Review of Money Finance and Banking, 11* - 99.

Akinbobola, T. O. (2012): "The Dynamics of Money Supply, Exchange Rate and Inflation in Nigeria," Journal of Applied Finance and Banking, 2(4): 117-141.

Augustine, C. O., Joseph, C. O., & Richard, O. O. (2016). Inflation dynamics in Nigeria: Implications for monetary policy response. *Journal of Economics and Sustainable Development, 7*(8), 243-248.

Adodo, F. L., Akindutire, O. R., & Ogunyemi, J. K. (2018). Monetary policy and control of inflation in Nigeria. *International Journal* economy *of Management, IT & Engineering, 8*(12), 154-170.

Bawa, S., & Abdullahi, I. S. (2012). Threshold effect of inflation on economic growth in Nigeria. *CBN Journal of Applied Statistics, 3*(1), 43 - 63.

Bhavesh, S., & Anuradha, P. (2019). Inflation dynamics and monetary policy in India: A new Keynesian Phillips curve perspective. *South Asian Journal of Macroeconomics and Public Finance, 1*-36.

Caceres, C., Poplawski-Ribeiro, M., Tartari, D. (2013): "Inflation Dynamics in the CEMAC Region," Journal of African Economies, 22(2): 239-275.

Chigbu, E. E.,& Njoku, M. (2013). The impact of monetary and fiscal policies on Nigerian economic growth. *European Journal of Business and Management, 5*(2), 13-24.

Farah, D., Ishtiaq, Q. (2016). A historical analysis of the theories of money. *International Journal of Business and Economic Development*, 4(1), 71-84.

Friedman, M (1956), *The Quantity Theory of Money* – A Restatement, University of Chicago Press, pp. 129.

Hapanyengwi, H. O., Mutongi, C., &Nyoni, T. (2019). Understanding inflation dynamics in the Kingdom of Eswatini: A univariate approach. *Munich Personal RePEc Archive,* 1-12.

Ikejiaku, B. V. (2008): "Africa Debt Crisis and the IMF with a Case of Nigeria: Towards Theoretical Explanations," Journal of Politics and Law, 1(4): 1-7.

Ibrahim, S., & Ifuero, O. O. (2020). A Comparative analysis of inflation dynamics models in Nigeria. *International Journal of Academic Research in Business and Social Sciences,* 10(2), 558-577.

Lucchetti, R. (2006): "Identification of Covariance Structures," Econometric Theory, 22(2): 235-257.

Mishra, P., Montiel, P. (2012): "How Effective is Monetary Transmission in Low.

Ogar, A., Nkamare, S. E, & Emori, E. G. (2014). Fiscal and monetary policy and its effect on the growth of Nigeria economy. *European Journal of Business and Management*, 6(29), 220- 232.

Ojeah, I. A., Nwogwugwu, C. C. U., & Ozoh, N. J. (2020). Inflation dynamics in Nigeria. *Journal of Economics, Management and Trade,* 26(1): 61-77.

Tekam, O. H. (2018). Monetary policy and inflation: Empirical evidence from Cameroon. *International Journal of Economics, Finance and Management Sciences,* 6(5), 200-207.

Tonprebofa, W. O. (2019). The dynamics of monetary policy and inflation in Nigeria. *IOSR Journal of Economics and Finance (IOSR-JEF),* 10 (2), 37-49.

Sani, B., Ismaila, S. A., &Adamu, I. (2016). Analysis of inflation dynamics in Nigeria. *CBN Journal of Applied Statistics, 1* (1), 255-275.

Saxegaard, M. (2006): "Excess Liquidity and Effectiveness of Monetary Policy: Evidence from Sub-Saharan Africa," IMF Working Paper, WP/06/115.

Sina, A., Ansgar, B., & Thomas, O. (2020). Unconventional monetary policy and inflation expectations in the Euro area. *PCPS Working Document,* 1-33.

Usman, A. B., & Aliyu, R. S. (2019). Inflation dynamics and exchange rate pass-through in Nigeria: Evidence from augmented nonlinear new Keynesian Philips curve. *CBN Journal of Applied Statistics,* 10(2), 109-138.

Umar, B. (2018). Exchange rate and inflation dynamics: Disaggregate consumer prices. *African Journal of Economics and Sustainable Development*, 1(1), 13-32.