The Dynamics of Inflation Rates in a Consumer Driven Economy

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Abstract: *The research was motivated by the conviction that inflation entails sizeable economic and social cost, and that for achieving a sustainable economic growth, management of inflation is a prerequisites. Co-integration and autoregressive error correction model approach was used to investigate the effect of money supply, fiscal deficits and export on the relative effectiveness of fiscal policy in Nigerian consumer driven economy. The study reveals there is a significant causal relationship between gross domestic product (GDP) and the variables considered in the research. The Granger causality outcomes demonstrate that there is no causality between money supply and inflation in Nigeria within the study period, meaning that there are different economic conditions that are key determinant of inflation in Nigeria. We conclude that fiscal policies have a significant influence on the output growth of the economy, and recommend that the Central Bank of Nigeria should guarantee an exchange rate stability and sound monetary surveillance, look inward for ways to regulate the interest rates that will encourage private and foreign investors to transform our consumer driven economy.*

Keywords: Co-integration, Autoregressive Error Correction Model, Fiscal Policy, Gross Domestic Product, Consumer Driven Economy.

JEL Classification: E31, E62, E64

1. INTRODUCTION

Inflation is an inevitable property of any economy in the world (Aurangseb, 2012). According to Greenidge & Dacosta (2009), inflation has been a topical issue since the early 1980s, when oil prices soared to record high figures. Ever since, the control of the rate of inflation has been of a high precedence for most countries, especially those with small open economies (Greenidge & Dakosta 2009). It is generally believed that monetary policy should be examined with fiscal policy and vice versa, as their individual stances and interaction play vital role in the economy. Thus, we argue that they also influence the performance of the stock market. The weak economic base became challenging from the early 1980s with the persistence of both external and internal disequilibrium. The collapse of prices of oil in the world market in turn triggered series of developments in the Nigerian economy such as a cumulated budget deficits of about almost N17.4 billion in the five years 1980–1984, are a prime example. The intensification of economic crisis led the government to adopt a structural adjustment programme (SAP) in July 1986. Some of the major factors responsible for inflationary pressures during the SAP era were the wholesale depreciation of the naira on the foreign exchange market that increased the naira prices of raw materials and capital goods imported, as well as unprecedented growth in money supply. Slow growth in output in both the agricultural and the manufacturing sectors were also undoubtedly related to inflationary pressures during the SAP era.

With particular reference to the manufacturing sector, its over-dependence on imports and small size has been attributed to its relatively slow output growth. Within the period 1992 to 1999, Nigeria's real gross domestic product (GDP) grew at an average of about 2.6%, which is far short of propelling the economy into sustainable development. Although, inflation in the early 1990s was exceptionally high at 45%, 57% and 72% in 1992, 1993 and 1995, respectively, a sharp reduction of this rate was witnessed in the late 1990s. The context of sustaining a low rate of inflation observed in the late 1990s presented a germane reason for the study of modelling the inflation process in Nigeria.

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Monetary policy influences stock market returns through five possible channels, namely: (i) the credit channel (ii) the interest rate channel (iii) the exchange rate channel (iv) the wealth effect (v) the monetary channel. According to Keynesian economics, fiscal policy supports aggregate demand, boosts the economy and drives stock prices. According to classical economics, the crowding out effect of fiscal policy in the market for loanable funds and of the productive sector of the economy could drive stock prices lower (Chatziantonion *et al.*, 2013).

The Nigerian economy recorded an enviable stepping up in growth as real gross domestic product grew by 6.27%, 7.57%, and 7.38%, in 2009, 2010 and 2011, respectively. In the same vein, growth in real per capital income was 2.78%, 3.76% and 4.78% in 2008, 2009 and 2010, respectively (an average of 3.77%). In Nigeria, during the first, second and third quarters of 2016 and first quarter of 2017, the gross domestic product shrank by 0.36%, 1.5%, 0.8% and 0.5% year on year, respectively. See Fashoyin (1984) gave a detailed discussion on the anti-inflation measures that were taken during this period.

Pressures for the increasment in salary/wages led to the establishment of the Wages and Salaries Review Commission. The Commission eventually granted salary increases to all categories of public service employees, and similar adjustments were later made in the private sector. These awards, which came at a time when the disruption of domestic production and marketing as a result of the civil war had not been fully repaired, generated a measure of excess demand in the economy. This is possibly the reason for the rise of inflation rate in 1971by 16.0%. Government's immediate response was to lift import restrictions on several categories of goods. Excise duties on a number of goods were also reduced. A credit policy, which favoured production of food, was also put in place. The establishment of the Nigerian National Supply Company (NNSC) and other measures were credited with the yielding of a relatively low rate of inflation of 3.2% recorded in 1972. Greater inflationary pressures were experienced for the period 1973-1985 than the period 1960–1972, with an average rate of inflation of 17.96% in those years.

Table 1: Episodes of Inflation in Nigeria

PERIODS	AVERAGES
1960-1972	5.01
1973-1985	17.96
1986-1995	31.30
1996-2012	13.34

Source: Computed by the author

This study focuses on high inflation rate (which is common to Nigeria and other similar economies) because it is one of the key macroeconomic aims of the government. This is because it has a direct implication on the standard of living of the residents in any country, especially in Nigeria. The study was aimed at analyzing the dynamics of inflation rates in a consumer driven economy by considering relationships between money supply and other potential determinants of inflation, effect of exchange rate shocks in consumer prices and examining the relationship between Government fiscal policy and prices of stock in Nigeria.

Empirical studies on how stock market and fiscal policy interacts are sparse, which poses a challenge for Nigeria, as a developing economy, to effectively consider and evaluate the importance of the stock market. Thus, the current study has as its objective to investigate the pivotal activities of the Nigerian government by evaluating and determining the effect and impact of government's revenues, expenditure and borrowing on market capitalization. The classical theory holds that cyclical swings in economic output and employment could be modest and self-adjusting. It also holds that if the cumulative demand in the economy falls, the consequential weakness in production and jobs would rapidly cause a decline in prices and wages, this would prompt employers to make capital investment and employ more people, thereby stimulating employment and restoring economic growth. The depth and severity of the Great Depression, however, severely tested this hypothesis (Babusidze, 2004)

The rest of the paper is organized as follows: section two review relevant literatures for the study, while the empirical analysis and results is presented in section three. In section four, the conclusion based on the results are discussed and finally, section five presents the recommendation.

2. LITERATURE REVIEW

Inflation has received considerable attention and has been widely studied by economist in developed as well as developing economies. Theoretically, two main schools of thought attempt to explain the inflation process. These are the monetarist and the structuralist schools. While the former holds that inflation is purely a monetary phenomenon, the latter opines that inflation results mainly from government fiscal operations and from the gap between potential output and aggregate demand. Most

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empirical studies have followed this dichotomization with slight modifications in providing empirical evidence for inflation in various countries.

As money supply rises, prices of goods and services increases, especially if the growth of output reaches full capacity as demonstrated by (Bello & Saulawa, 2013). In addition, this increase in money stock would lead to minimum adjustment of wages and salaries and cause the government through the Central Bank Nigeria finance its deficit budget as observed by Bhattarai (2011). In contrast to the above, if output is inelastic, it may be due to constraints in foreign exchange, technological underdevelopment or low productivity when there is a tendency that it will expose inflationary pressures. Furthermore, Olive (2002), and Campa & Goldbery (2005) posited that changes in exchange rate would cause foreign firms to pass changes in export exchange rate in the markets fully to their selling prices (i.e., complete pass-through) to allow exchange rate changes to keep the selling prices unchanged. Goldberg & Knetter (1997) found that in the United States that around 60 percent of the changes in exchange rate could be passed on to import prices.

Studies such as (Jose & Lindu 2004), Jose & Lindu (2004), Taylor (2001), Goldfajin & Werlang (2000) dwelt on whether this decline in pass-through and a purported move toward general decline in pass-through rates are related to improved macro-economic conditions in the importing countries. Yet, another issue is relationship between exchange rate fluctuation and inflation. Taylor (2000) proposed the hypothesis that responsiveness of prices to exchange rate fluctuations positively depends on inflation. In addition, we found out that existing study focuses on the relationship between movements in nominal exchange rate and the prices of import. A smaller but equally important aspect of literature concentrated on the macro-economic exchange rate pass-through to aggregate price indices. However, studies have shown that the degree of pass-through significantly varies from one country to another.

Furthermore, empirical studies have been carried out with far reaching results on the impact of exchange rate pass-through to consumer prices. Mc Carthe (2000) for a member of industrialized countries presented a comprehension study of exchange rate pass-through on the aggregate level by estimating producer, import and consumer price with a vector auto-regression (VAR) model, from 1776 to 1998. For most of the economies analyzed, the openness of the country was positively correlated to a modest exchange rate pass-through to consumer prices and negatively correlated with the volatility of the exchange rate. Kim (1998) for the United States investigated the exchange rate pass-through using a multivariate co-integration framework. This study relates to both changes in producer prices and trade weighted nominal effective change rate, aggregate income, money supply and interest rates. Although, exchange rate was found to significantly contribute to producer prices.

Ricon (2000) in his study of pass-through exchange rate for Colombia using Johansan (1988; 1991) framework to estimate the pass-through effect on a monthly data from 1980 to 1988, found the exchange rate pass-through to be in complete. The long-term estimated elasticities of both prices of import and export to a change in exchange rate were approximately 0.84 and 0.61 respectively. More so, the direct effect of exchange rate on the consumer prices on a long-term was found to be 0.84. Similarly, the degree of exchange rate pass-through to consumer prices and import in Nigeria between 1986 Q1 and 2007 Q4 as investigated by Aliyu *et al*. (2008) using vector error correction model found that exchange rate pass-through, was slightly higher, significant and persistent in import than it was for consumer prices. These results among other things in Nigeria, suggested that exchange rate pass-through declines along the price chain and partly overturns the conventional insight in the literature that developing economies always have a considerable higher ERPT than developed economies. Another author, Adetiloye (2010) evaluated the relationship between exchange rate and Consumer price index (CPI) in Nigeria using correlation and Granger causality. The study found that there was a high and positive relationship between the ratio of imports and the index, than those that exists between the parallel and the official rates. The co-efficient between autonomous exchange rate and the CPI is less significant than official rate, though the import ratio was found to show a near two-way balanced causality in the economy with consumer price Index. The more significant one is causality is that import ratio granger causes CPI.

Metin-Őzcan *et al.* (2004) also examined inflation dynamics in Turkey between 1988 and 2000 using univariate techniques opined that CPI inflation have strong inertia with all their selected price inflations. Their study found significant positive correlations between the dynamics of housing rents and the CPI, and both the US Dollar and German Mark exchange rates and the CPI. Cevik & Teksoz (2013) using Libyan yearly data between the period 1964 and 2010 investigated dynamics of inflation with cointegration and error correction models. The study found inflation inertia to be a key determinant of consumer price inflation in Libya. The result also indicated that government spending, global inflation, money supply growth, exchange rate pass-through, and imposition and subsequent removal of international sanctions plays a central role in inflation process for Libyan.

Kabundi (2012) employed single-equation error correction model based on the quantity theory of money to identify the major factors that underlay inflation in Uganda. His study showed that in Uganda inflation is affected by both external and domestic factors, amongst which are money growth, world food prices, domestic supply and demand effects in the agricultural sector, energy prices and inflation inertia. Butt & Jamal (1988) explored the factors affecting inflation in Pakistan by applying the

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"monetarist approach". The study showed, in contrast to Friedman (1963) that the growth of monetary variables do not provide satisfactory explanation of inflation process in Pakistan, hence, monetary policy as a tool for restoring price stability may not be very effective in the country. They showed that inflationary process in Pakistan is played by changes in expected cost of holding money balances and not import prices, as inflation in Pakistan mainly originates domestically.

On the other hand, Chaudhary & Ahmad (1996) tested monetary and structural variables to identify the major determinants of inflation in Pakistan. Unlike Butt & Jamal, they found that only constant growth in money supply does significantly affect inflation, but remarked that inflation is not purely a monetary phenomenon in Pakistan. Their result indicated that the significant structural variables determining inflation in Pakistan were growth of the services sector, deficit financing of the budget through public debt and import prices. Coppin (1993) examined the determinants of inflation in a tourism-dependent economy of Barbados during the 1980s. His study indicated that the significant determinants of inflation were the levels of real output (proxied by real tourism activity), imported inflation and interest rates during the period. He opined that institutional processes associated with the government's annual budget might have also impacted domestic prices. Using Turkish data, Lim & Papi (1997) found that monetary variables (initially money, more recently the exchange rate) play significant role in the inflationary process. They added that public sector deficits and inertial factors also contribute to the inflationary pressures. The study also remarked that in the past 15 preceding their work, policy makers' commitment to active exchange rate depreciation on several occasions also contributed to the inflationary process.

Laryea & Sumaila (2001) found in their study that in the short-run for Tanzania, output and monetary factors were the major determinants of inflation, while in the long-run parallel exchange rate played a key role to output and monetary factors,. They remarked that inflation is engineered more by monetary factors than by real factors based on the magnitudes of price elasticities with respect to both money and output and concluded that inflation is a 'monetary phenomenon' in Tanzania. Similarly, Wolde-Rufael (2008) indicated that money supply and deficits financing seem to have a significant effect on the Ethiopian inflationary process. The authors opined that a possible essential policy tools for Ethiopia's long-term macroeconomic stability and growth was to control the growth of money supply and narrow budget deficits. Adu & Marbuah (2011) applied the bounds testing approach to empirically analyzed factors that account for inflation dynamics in Ghana. The study identified a combination of structural and monetary factors including real output, nominal exchange rate, broad money supply, nominal interest rate and fiscal deficit, as determinants of inflation. They however, stated that inflation is mainly affected by output growth.

Oyejide (1972) exploring the impact of deficit financing on inflation and capital formation in Nigeria related the supply of domestic money to inflation using Fisher's equation. The study found a direct correlation between the general price level and measures of deficit financing over the study period 1957-1970; and concluded that less emphasis that financing deficits may limit the growth of price inflation in the country. In Akinifesi (1984), captured as variables factors the changes in money supply, credit to government by the banking system, lagged changes in money supply, expenditure deficit of government, industrial production and food price indices, while annual data for 1960-1983 were used in the empirical estimation. The study showed that changes in the above-mentioned factors jointly explains inflationary tendencies in Nigeria. it, however, emphasized that increasing government expenditure financed through monetization of oil revenue and credit from the banking system were responsible for the expansion of money supply, which in turn, contributed significantly to inflationary tendencies.

Asogu (1991) focused on the econometric investigation of the nature and causes of inflation in Nigeria. The study found that increase in real GDP or supply situation, especially food, and low cost of production of consumables tended to improve inflation. He added that increase in government expenditures – deficits financing, tend to increase the money supply and worsen the depreciation of the exchange rate, which in turns deepen the inflationary pressure. The author however, noted that the monetary model does not adequately explain the inflation process in Nigeria. Moser (1995) developed an error correction model of the inflation process in Nigeria based on money market equilibrium condition to analyze the dominant factors influencing inflation in Nigeria using annual data spanning from 1960-1993. The author found that monetary expansion, driven mainly by expansionary fiscal policies, explains to a large degree the inflationary process in Nigeria while other factors were devaluation of the Naira and agro-climatic conditions.

Fakiyesi (1996) using data from 1960 to 1994 identified the major determinants of inflation in Nigeria. The author found that the significant factors in explaining the movement of inflation in Nigeria were monetary expansion, exchange rate growth in real income and the level of rainfall; while Onwioduokit (1999) showed that fiscal deficit causes inflation in Nigeria, and that it takes at least two years to impact on inflation. Masha (2000) indicated that inflation in Nigeria is driven from both the demand and the supply side. The pressures on the demand side arises from changes in monetary aggregates, while the supply side pressures arise from the salient characteristics of the economy including climatic conditions, production structure, devaluations of currency, wage increases and changes in terms of trade. Olubusoye & Oyaromade (2008) analyzed the main sources of fluctuations in inflation in Nigeria utilizing the error correction mechanism and annual data from 1970 to 2003. They indicated that the factors that

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significantly propagate the dynamics of inflationary process in the country were lagged CPI, expected inflation, petroleum prices and real exchange rate. They added that to achieve price stability the monetary authority's efforts would continuously be disrupted by volatility in the international price of crude oil. Variables included in their analysis were expected inflation, fiscal deficit/GDP, GDP, interest rates, money supply, oil prices, average rainfall and real exchange rate.

To the best of the authors' knowledge, the cause of high inflation in Nigeria is mainly attributed to the latter viewpoint than the former. However, except if, the Central Bank of Nigeria ensures that a consistent growth of money is adequately controlled with the rate of economic growth in the country as buttressed (Kwon, McFarlane, & Robinson, 2006). Furthermore, earlier studies by authors and policy makers clearly shows that there are mixed and conflicting findings about the relationship between money supply and inflation. Therefore, the aim of this current study is to reexamine the effect of money supply on inflation in Nigeria, with the intent to contribute to the existing body of knowledge by re-appraising empirically money supply effects on inflation in Nigeria. In addition, it intends to improve our knowledge about diverse explanation in the literature that have outlined money supply and inflation both in pragmatic and hypothetically as it relates to Nigeria.

The author's empirical findings suggested that the higher rates are mainly as a result of the depreciating of the country's currency and increases in the prices in the public sector.

3. EMPIRICAL ANALYSIS

3.1 Analytical Approach

It is important to distinguish three sources of the shock, two of which are tangible.

• First are the purely medical shocks where workers in their sickbeds are not producing [GDP].

• Second is the economic impact of public and private containment measures – things like school and factory closures, travel restrictions, and quarantines.

• The third is literally 'all in our heads'. Belief-based economic shocks, individual behaviour depends upon beliefs, and these are subject to the usual cognitive biases; Human brains evolved in a walking-distance world, where future increments could reasonably be predicted by past increments. Using increments to predict increments is 'straight-lining the future' (i.e. linear approximation).

3.2 Sources of Data and Model Specification

We employed data from Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank Development indicators. The data used for this study spans from 1970-2016. Based on previous studies like in the literature, about various arguments on the determinants of inflation, we specify that Inflation proxy by consumer price index (CPI) is a function of money supply (MS), output (GDP), real exchange rate (RER), domestic oil price (DOP), and monetary policy rate (MPR), government expenditure (GE) according to authors like; Mbonge *et al*., (2014) and Sabade (2014) etc. Our model is as specified in equation 1.

$$CPI_t = f(MS, MPR, EXR, RGDP, DOP)_t \tag{1}$$

Equation (1) is written in an econometric form as seen in equation (2) below:

$$CPI_t = \beta_0 + \beta_1(MS)_t + \beta_2(MPR)_t + \beta_3(RGDP)_t + \beta_4(RER)_t + \beta_5(DOP)_t + \varepsilon_t \tag{2}$$

Furthermore, to produce the most appropriate coefficient for the CPI with respect to the independent variables, the model in equation (2) is transformed on a log-log econometric form as seen in equation (3) below.

$$\ln CPI_t = \beta_0 + \ln \beta_1(MS)_t + \ln \beta_2(MPR)_t + \ln \beta_3(RGDP)_t + \ln \beta_4(RER)_t + \ln \beta_5(DOP)_t + \varepsilon_t \tag{3}$$

Where; 'ln' represents natural log. The log-log transformation is helpful to, among others, reduce the problems of multicollinearity and heteroskedasticity, achieve a better fit (thus estimating elasticities rather than slopes, making the variables to appear more symmetric according to Gujarati & Porter, 2009). Since we are interested in examining the impact of money supply and inflation and their long run interaction as well, we rely on an Autoregressive Dynamic Lag Error Correction Model (ADLECM). This approach has been used by Mbonge *et al*., (2014) to test the relationship between money supply and inflation in Tanzania. After testing for the existence of long run linear relationship between the variable, with the null hypothesis of no Cointegration among the variables in equation (3) specified thus:

$$H0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \quad \text{Versus} \quad H1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$$

Accordingly, if the results show the existence of co-integration, then we can proceed to estimate the error correction model according to Sorensen (2005). Therefore, the need for disequilibrium in the short run necessitate the use of a Dynamic Error Correction mechanism (ADLECM) in this study, so that one can treat the error term from equation (3) as the equilibrium error which can then be used to tie the short run behaviour of the dependent variable to its long run value. Thus, the ADLECM model of this study is presented as follows:

$$\mu_t = \ln CPI_t - \beta_0 - \beta_1 \ln MS_t - \beta_2 \ln MPR_t - \beta_3 \ln RGDP_t - \beta_4 \ln RER_t - \beta_5 \ln DOP_t + \beta_6 t \tag{4}$$

$$\Delta \ln CPI_t = \alpha_0 + \alpha_1 \Delta \ln MS_t + \alpha_2 \Delta \ln MPR_t + \alpha_3 \Delta \ln RGDP_t + \alpha_4 \Delta \ln RER_t + \alpha_5 \Delta \ln DOP_t + \alpha_6 \Delta \mu_{t-1} + \varepsilon_t$$

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Where; ε_t is the white noise disturbance and μ_{t-1} is the lagged value of the error term in the previous model when the error term is non–zero, meaning that the model is in disequilibrium. More so, the value of α_6 shows how fast the equilibrium converges. Furthermore, this study intends to use the Granger causality test to ascertain the direction of causality between money supply and inflation in Nigeria. The reason for this is owing to the postulation of the Quantity theory of money which critics presumes a causal relation between money supply and inflation to be one-sided. Consequently, the need establishes the exact direction of causality between these variables. This in turn, would prompt policy makers to point out the avenues of influence and outcomes after implementation of the policy.

3.3 Variable Measurements

Data used in this paper are annual figures which spans from 1975 to 2016 and include: consumer price index (headline consumer price index), money supply (narrow money), real exchange rate, domestic oil price, output proxy by real GDP, and monetary policy rate respectively are sourced from National Bureau of Statistics and Central Bank of Nigeria Statistical Bulletin (2016), all of which were measured in naira except the rates. CPI was used to proxy inflation due to the fact that quantity theory of money though, accepted but criticized on the ground that there are different drivers of prices in an economy. Gross domestic product was used to proxy for output, while, the volatile nature of the Naira (Nigeria's currency) to dollar exchange rate serves as the real exchange rate, monetary policy rate was used to proxy money market rate. Lastly, the money supply data is proxy by narrow money and is in billions of naira.

3.4 Results and Discussion

In an attempt to examine whether money supply is the cause of high inflation in Nigeria, this section begins by conducting some preliminary analysis (descriptive statistics, Unit root test and cointegration test) on the variables employed in the study. The result is presented in Tables 1, 2 and 3 below.

3.4.1 Preliminary Analysis

Table 1: Descriptive Statistics of Variables in the study model

	LCPI	LMS	LDOP	LRER	LRGDP	LMPR
Mean	1.667085	12.49025	1.111717	2.423160	13.93486	2.277053
Median	1.834180	12.19844	1.178655	3.085852	14.04588	2.484907
Maximum	5.364105	19.31790	4.976734	5.717028	18.43547	3.258097
Minimum	-2.302585	6.885714	-2.471004	-0.604404	8.347353	1.252763
Std. Dev.	2.532786	3.675899	2.620173	2.346094	3.167716	0.513162
Skewness	-0.118016	0.403930	-0.013838	-0.121182	-0.184820	-0.424360
Kurtosis	1.488367	2.176371	1.353424	1.351085	1.794918	2.055003
Jarque-Bera	4.583958	2.606548	5.310957	5.439588	3.111512	3.159470
Probability	0.101066	0.271641	0.070265	0.065888	0.211030	0.206030
Sum	78.35302	587.0415	52.25069	113.8885	654.9385	107.0215
Sum Sq. Dev.	295.0901	621.5628	315.8040	253.1912	461.5835	12.11344
Observation	47	47	47	47	47	47

Source: *Authors computation from E-views 7*

Table 1 shows that LMS is highly volatile with the highest standard deviation. All variables are negatively skewed except the value of LMS which is positive thereby implying that they are left long tail. Evidence from the Jarque-Bera (JB) test indicates that all variables utilized in the model are normally distributed. More so, that the variables are first differenced and computed by the ratio relative to prior observation.

3.4.2 Unit Root Test
Table 2: Result of Unit Root Test

	AT LEVEL				AT FIRST DIFFERENCE			
Variable	ADF-t stat	PP-t stat	CV at 5%	Decision	ADF-t stat	PP-t stat	CV at 5%	Decision
LMS	0.470090	0.605112	-2.926622	NS	-7.260224	-7.26191	-2928142	S
LDOP	0.166940	0.166940	-2.926622	NS	-5.663817	-5.620572	-2928142	S
LMPR	-2.296816	-2.083082	-2.960411	NS	-7.059619	-8.850366	-2929734	S
LRER	-1.723612	-1.840679	-2.926622	NS	-3.250133	-3.250133	-2918853	S

LCPI	-0.830764	-0.596874	-2.926622	NS	-3.523589	-3.403172	-2928142	S
LRGDP	-1.287820	-2.990516	-2.926622	NS	-6.292812	-6.740605	-2928142	S

Source: Authors computation from E-views 7

In testing for unit root, the researchers employed both Augmented Dickey Fuller and Philip Perron test. To achieve this, a null hypothesis that the variables have a unit root was set. Expectedly, based on the p-values and t-statistics that the null hypothesis of a unit root was not rejected, meaning that, all the variables of interest are not stationary at level. But, after taking the first difference of these variables, they now became stationary using both (ADF and PP) test as presented in Table 2.

3.4.3 *Co-integration Test*
Since, the variables are stationary at first differencing; we proceed to test the existence of long run relationship among the variables. The result of the Johansen co-integration test is presented in Table 3.

Table 3. Result of Co-integration Test

	Trace Test			Maximum Eigen Value Test			
Null	**Alternative**	**Statistics**	**95% Critical Values**	**Null**	**Alternative**	**Statistics**	**95% Critical Values**
r = 0	r ≥ 1	205.744	95.7537	r = 0	r = 1	78.0476	40.0776
r ≤ 1	r ≥ 2	127.697	69.8189	r ≤ 1	r = 2	58.9120	33.8769
r ≤ 2	r ≥ 3	68.7846	47.8561	r ≤ 2	r = 3	33.7870	27.5843
r ≤ 3	r ≥ 4	34.9976	29.7971	r ≤ 3	r = 4	18.2019	21.1316
r ≤ 4	r ≥ 5	16.7958	15.4947	r ≤ 4	r = 5	12.5170	14.2646
r ≤ 5	r ≥ 6	4.27878	3.84147	r ≤ 5	r = 6	4.27878	3.84147

Source: Authors computation from E-views 7

From Table 3, it was observed that, the null hypothesis of no co-integration for $r = 0, r \leq 1, r \leq 2, r \leq 3, r \leq 4$ and $r \leq 5$ were rejected by the trace statistics method. Although, the null hypothesis $r \leq 3$ and $r \leq 4$ were not rejected by the maximum Eigen values statistics due to the fact that, that their statistical value was less than their critical values. The implication is that, there is a long run relationship among the variables with 3 co-integrating equations at 5% level of significance in the model.

3.4.4 *Error Correction Model*
Co-integration and non-spurious regression are the fundamental requirements of ECM. Consequently, the results of co-integration test (Table 3) and that of both ADF and PP test (Table 4) provide enough evidence on the long run relationship among the variables under consideration as there are three co-integrating vectors and Stationarity of residual at level, therefore, the basis to estimate ECM. The result is presented in Table 5.

Table 4: Residual Stationarity Test Results

Variable	ADF Test	PP Test	Order of Integration
Residual	-3.90888	-3.07362	I(0)

Table 5: Result of the ADLEM

Variable	Coefficient	Std Error	t-Statistic	Prob.
C	0.041139	0.024522	1.677675	0.1021
ECT (-1)	-0.206566	0.074042	-2.789842	0.0084
DLRGDP	0.179743	0.051017	3.523205	0.0012
DLDOP	0.114849	0.032010	3.587967	0.0010
DLCPI (-1)	0.427565	0.104490	4.091918	0.0002
DLRER (-2	0.103789	0.047783	2.172087	0.0365
DLMPR (-1	-0.134612	0.062627	-2.149434	0.0384
DLMS (-1)	-0.017618	0.033000	-0.533861	0.5967

R^2 =0.64, Adj. R^2=0.58, F-Stat = 9.286, Prob. <F (0.0001), DW= 1.68

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The ECM results show that there is mixed impact of the exogenous variables on inflation between the captured period. Meaning that, some of the exogenous variables indicated a positive influence on inflation, while others had a negative influence on it in the short run. Evidence from the F-statistics indicates that the explanatory variables are jointly significant. R^2 value of 0.64 indicates that 64% of the variations in the response variables are accounted for by the changes in the explanatory variables. The value of DW statistics which is approximately (2.0) shows the absence of serial autocorrelation.

For example, the coefficient of the past values of MPR (-0.135) and MS (-0.018) has a negative influence on the current value of inflation in Nigeria. Although, the former was found to be statistically significant while the latter statistically insignificant in the current value of inflation. This in turn, contradicted the popular monetary postulation which buttress that, the general price levels of goods and services is directly proportional to the amount of money supply leads an increase in the price level vis-à-vis inflation (Moses *et al.*, 2015). Similarly, the current value of real GDP and the domestic oil price (DOP) were found to impact the current inflation figure in the economy. In addition, it was discovered that the first lagged value of inflation and second lagged value of the real exchange rate was found to exert influence on the current value of inflation in Nigeria positively.

The adjustment coefficient error term was found to be non-zero and negative as expected and statistically significant at the 5% level, indicating dynamic stability of inflation. Consequently, it can be inferred that in the short run, the model diverges from the equilibrium. Thus, variations in inflation via CPI can be regulated by adjusting the money supply, the real exchange rate, monetary policy rate, output and price of fuel respectively towards convergence in the equilibrium. More particularly, the coefficient of the ecmt-1(-0.2065) in Table 5 pinpoints the adjustment mechanism of the equilibrium with the break of the model at 0.27 units. The implication from the aforementioned is that 21% of errors are corrected yearly from the previous periods in the short run dynamic process.

Despite, the appropriateness of the model, it was further verified by carrying out various diagnostic tests on the residual of the ECM model. They include: Normality test, Serial correlation LM test and Heteroskedasticity test respectively. Evidence from these results showed that the residuals of model passed the three tests based on their probability values.

3.4.5 *The Granger Causality Test*
Table 6: The Result of Ganger Causality Test

Direction of causality	F- value	Observation	Probability	Decision
CPI- MS	0.1594	43	0.9574	Do not reject the null
MS -CPI	0.9170	43	0.4653	Do not reject the null
RER -CPI	2.6932	43	0.0473	Reject the null
CPI -RER	2.9820	43	0.0326	Reject the null
RGDP- DOP	6.3466	43	0.0006	Reject the null
DOP -RGDP	3.4751	43	0.0175	Reject the null

The result of the causality test as shown in Table 6 reveal that the null hypothesis of no causality was not rejected at 5% level of significance. Meaning that, there is no causality between money supply and inflation, which outcome is consistent with the study of Koyuncu (2014). Hence, money supply does not granger cause inflation and vice-versa in Nigeria.

4. CONCLUDING REMARKS AND POLICY SUGGESTIONS

This study investigates if money supply is the cause of high inflation in Nigeria and concludes that money supply does not have a significant impact on inflation both in the short and long run in Nigeria. This is evidence from the results obtained from the analysis. This result tends to support the work of Akinbobola (2012) who posited that inflation seems to find no explanation on money supply in Nigeria.

Consequently, the government of Nigeria needs to put in place other measures that trigger inflation in Nigeria, which include: high exchange rate, interest rate and high domestic fuel price, respectively, to achieve low inflation rate. The study also revealed that monetary policy rate has an impact on money expansion that is accompanied with a reduced interest rate. This in turn will make it possible for banks to provide credit to private sectors at a low lending rate; thereby fostering the economy and vice-versa. In this wise, the government can use inflation as a watch dog on the efficacy of monetary policy since, it is generally known as a monetary phenomenon.

The above result was also supported by the result of our Granger causality test, that there is no causality between money supply and inflation during the periods under study. Meaning that, money supply is not a major cause of inflation; rather it is caused by some structural factors in the country.

Causality inferences are quite interesting implying bi-directional as well as uni-directional relationships among few variables. But money supply, gross domestic product, government expenditures and government revenue have significant effect on consumer

price index. Thus it is suggested that gross domestic product, government expenditure, and imports should not get so high that they raise price levels that are not in favor of any economy.

5. RECOMMENDATION

The study recommends that the federal government through the monetary authorities should regulate the monetary policy rate downward to encourage foreign and private investment in the country, which in turn boosts economic growth at large. In addition, the government should reduce her outrageous expenditures and control the incessant budget deficit that has been recorded in Nigeria while the central bank should desist from creating cheap currency so as to curb excess supply of money in the economy. The government should diversify the economy; enact easy export policy, stop subsidizing fuel price because they turn out to be among the factors that triggers high inflation in Nigeria possibly because of the ripple effect them exhibit on economic activities at large vis-a-vis transportation, prices of food, necessity items to mention few.

Also, if the Government can embark on the following strategic levers for growth: drive OPEC and the world towards supply cuts, localize refining of petroleum products, enhance access to credit, promote agricultural policies to drive self-reliance and reduce imports, leverage infrastructure deficit financing to boost the economy and stop protecting the Naira [let it fall]. Thus, the multi-dimensional and dynamic nature of the determinants of inflation in Nigeria pose a problem for future/further researchers to continuously make recommendations to curbing inflationary tendencies in Nigeria.

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