Macroeconomic Variables: Road Map for Empirical Analysis of the Determinant of Inflation in Nigeria.

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Abstract: The study examined the Macroeconomic variables: Road map for determinants of inflation in Nigeria. In order to ascertain the relationship between inflation and other macroeconomic variables such as GDP, Money Supply, government deficit, Import cost, Exchange rate, Lending rate and Petroleum Motor Spirit in Nigeria economy. An empirical analysis was carried out to investigate the relationship between inflation(CPI) and other variables (monetary and output) from 1981-2010. The Central Bank of Nigeria have been resilient in fighting the arbitrary surge in inflationary trend in Nigeria in order to maximize the welfare of her citizenry. The stance of the monetarist Economists that inflation is everywhere a monetary phenomenon and can effectively be handled by the monetary policy was the quest for this research. To confirm the monetary claim, the study adopted the VAR methodology on Nigeria time series data of the identified variable such as GDP, Money supply, government deficit, Import cost, Exchange rate, Lending rate and Petroleum Motor Spirit. Secondary data from the Central Bank National Bureau of Statistic is used. The result confirms that inflation is a monetary phenomenon even in Nigeria economy. The findings is that some of the variables used in the models, money supply, Petroleum Motor Spirit and Gross Domestic Product were the most impactful of all the explanatory variables on the trends of inflation in Nigeria. The study recommends strict adherence to monetary policy that will address the scourge of inflation in Nigeria in order to increase output productivity.

1. Introduction

It is incontrovertible fact that economy of the World cannot blossom in the face of high Inflation which typifies higher prices of goods and services. The consumers cannot maximize their utilities, firms and industries will eventually cut down on production activities leading to downsizing of her work force. This underscores the reason why developed economies are on the vanguard to design appropriate macroeconomic policies to attain inflation figure of a single digit. To achieve this effectively, macroeconomic variables such as Gross Domestic Product, lending rate, Petroleum motor spirit, Money supply, Exchange rate, Government deficit Expenditure have to be investigated.

Macroeconomics management stability strengthened the economy both by price control (inflation) and output generation (employment). In effect, monetary policy refers to the use of some combinations of instruments by the Central Bank to influence the availability and cost of credit and /or money in the domestic economy with a view to achieving macroeconomic balance. Price stability is usually the primary focus of monetary policy (Orubu, 2009).

The maintenance of macroeconomic price stability is one of the challenges facing the Nigerian government in our economic history. This elusive factor is known and referred to as inflation. According to Olafin (2001) Inflation is defined as “a persistent rise in prices that can be influenced by labour supply behavior. In a broader perspectives, Dwivedi, (2007) defined inflation as “a considerable and persistent rise in the general level of prices over a long period of time”

1.2 Background to the Study

Since the inception of Central Bank of Nigeria (CBN) March, 1958, efforts have been made by the CBN Governors to tackle inflation. The worrisome dimension to this is that different administrations have not been able to sustain the programme of their predecessors. The mendacious nature of Nigerian governmental policies exacerbates inflation placing a high demand on the CBN Governors to evolve a sustainable approach to curb it. Inflationary pressures reflecting in persistent rising prices remain a going concern to the policy
authorities since late 1960’s Fatukasi (2004). Nigeria has witnessed high volatility in inflation rate. Instances abound where inflation became worrisome in excess of 30 percent. The oil boom period, Udoji Committee period to double minimum wage of workers, Festival for Art and Culture (FESTAC) in Lagos. Worst still is the period characterized by the devaluation of naira by the Central Bank of Nigeria (CBN) through the second Tier Foreign exchange market (SFEM) which resulted in deficit in agricultural outputs as machines and raw materials (mostly imported) were out of reach (Fatukasi,2004).

The devaluation reduced the aggregate real income and aggregate demand at the same time raised the naira prices of goods whose production depended heavily on imported goods. Thus unsold inventories accumulated in the face of consumer upheaval. This circumstance plummet the National Income (NI) and the price level hiked (Osagie, 1989). At this point, inflation rate rose to 72.8% due to increased lending rate, the policy of guided deregulation and the lagged impact of fiscal indiscipline.

In efforts to stem the tides of inflation in Nigeria, the policy authorities have over the years used a combination of several measures, ranging from wages freezes, price controls, direct involvement and distribution of ‘essential’ commodities, to fiscal and monetary strategies.

Traditionally, the strategy adopted by many central banks in seeking to achieve low and stable inflation rates has been through the targeting of intermediate variables such as monetary aggregates or the exchange rate (Owoye, 2007), albeit within encompassing framework which simultaneously takes into account such objectives as growth and employment.

Although the Nigerian government has taken various approaches such as taking loans to finance the deficit, subsidy removal on oil, and the devaluation of Naira currency, yet inflation in Nigeria has moved from single digit to double digit which is alien to economic stability.

It is on this note that this study seeks to examine the Macroeconomic variables: a road map for empirical analysis of the determinants of inflation in Nigeria with the aim to identifying the key variable necessary in controlling inflation in Nigeria.

1.3 Problem investigation

Inflation has reduced naira currency in the face of other foreign currencies. In effect, low investment by the indigenous and Multinationals Corporations (MNC) in Nigeria economy has been on the increase due to high cost of equipment thereby entrenching a pervasive unemployment spiral. Food prices have soared due to ban on importation of food items. This has reduced consumer basket bundle as well as household savings in the face of unfettered inflationary helix in the Country.

1.4 Objectives of the study

1) To determine the relationship between inflation and money supply.
2) To examine the relationship between inflation and other macroeconomic variables (such as GDP, government deficit, import cost, exchange rate, lending rate and Petroleum Motor Spirit) in Nigeria.

1.5 Research hypotheses

The research hypotheses for this study are stated as follows:

$H_{01}$. There is no significant relationship between inflation and money supply in Nigeria.

$H_{02}$. There is no significant relationship between macroeconomic variables (such as GDP, government deficit, import cost, exchange rate, lending rate and Petroleum Motor Spirit) and inflation in Nigeria.

1.6 sources of Data

The data used was obtained from CBN Statistical Bulletin and Annual Reports of volume 21, 2012. Other sources include internet, Journal, Seminar Papers and government publication.

1.7 Economic Variables Considered

**Consumer Price Index (CPI):** This measures changes in the price level of a market basket of the consumer goods and services.

**Nominal Gross Domestic Product (GDP):** This measures the current market prices of goods which have not been adjusted for inflation.

**Money supply (MS):** This is the currency in circulation held by the public and the bank.
2. Literature review

2.1 Conceptual Review

Inflation has been widely described as an economic situation where increase in money supply is faster than the new production of new goods and services in the same economy (Hamilton, 2001). According to Jhingan (2000), inflation is a sustained rise in the general price level brought about by high rate of expansion in the aggregate money supply. Inflation emerges in the economy on account of the increase in the money income of certain sectors of the economy without any corresponding increase in their productivity, giving rise to an increase in the aggregate demand for goods and services which cannot be met at the current prices by the total available supply of goods and services in the economy.

The cost associated with high and unstable inflation has always been emphasized overtime by monetary authorities and other stakeholders in the economy. Inflation imposes negative spillover on the economy especially when it interferes with the efficiency of an economy. It has been established, at least theoretically, that inflation can lead to uncertainty about the future profitability of investment projects (especially when high inflation is also associated with increased price variability). Thus, this leads to more conservative investment strategies than would otherwise be the case, ultimately leading to lower levels of investment and economic growth. Moreover, inflation can interact with tax system to distort borrowing and lending decisions where business organizations may have to devote more resources to dealing with the effects on inflation. However, inflation can lead to increase in the accumulation of capital whenever economic agents are induced to substitute financial assets for cash.

Regarding the measurement of inflation, quite a number of measures has been suggested and widely employed as measures of inflation in theory and practice. Prominent among these measures are consumer price indices (CPIs) which measure the price of a selection of goods purchased by a "typical consumer"; as noted by Fatukasi (2006), the Consumer Price Index (CPI) approach, though it is the least efficient of the three is used to measure inflation rates in Nigeria as it is easily and currently available on monthly, quarterly and annual basis (CBN, 1991), this assertion is however corroborated on the fact that Demberg and McDougall in their discourse explicitly refer to inflation as a continuing rise in prices as measured by an index such as the Consumer Price Index (CPI) or by the implicit price deflator for Gross National Product (Jhingan 2002).

Cost-of-living indices (COLI) which often adjust fixed incomes and contractual incomes based on measures of goods and services price changes; producer price indices (PPIs) which measure the price received by a producer. This differs from the CPI in that price subsidization, profits, and taxes may cause the amount received by the producer to differ from what the consumer paid. There is also typically a delay between an increase in the PPI and any resulting increase in the CPI. Producer price inflation measures the pressure being put on producers by the costs of their raw materials. Also, Wholesale price indices (WPI), which measure the change in price of a selection of goods at wholesale, prior to retail mark ups and sales taxes; commodity price indices (CPI), which measure the change in price of a selection of commodities that are weighted by the relative importance of the components to the "all in" cost of an employee; and GDP Deflators, which measures price increases in all assets rather than some particular subset. The term "deflator" in this case means the percentage to reduce current prices to get the equivalent price in a previous period.

2.2 Empirical Evidence

Bandara (2000) investigated the short run dynamics of the inflation, using a co-integration approach and found that both money supply and exchange rate movements have significant influences on the behaviour of the rate of inflation in the long run. Based on the error correction model he indicated that money supply doesn’t have any significant impact on the rate of inflation. The OLS model he used is

\[ \log (p_t) = a0 + a1 \log (PFt) + a2 \log (et) + a3 \log (Mt) + U_t \]
and variables are foreign price \((P_{it})\), Money supply \((M_t)\) and Exchange rate \((et)\). While the exchange rate depreciation and the foreign price levels have significant effects, the driving force behind domestic inflation appears to be inflation inertia.

Chaudhry and Chaudhry (2005) examined the determinants of inflation in Pakistan using ARDL approach to co-integration using the following model:

\[
\log(p_t) = \alpha_0 + \alpha_1 \log(m_t) + \alpha_2 \log(Y_t) + \alpha_3 \log(F_t) + \epsilon_t \quad \text{--------------------------- (2)}
\]

\(pt\) = Price level, \(Y_t\) = real output, \(m_t\) = M2 definition of money supply, \(F_t\) = unit price of imported goods. They found that the growth rate of import prices is the most important determinant of inflation in Pakistan both in the short run and long run, which is followed by the growth rate of output in terms of importance. The effect of Money supply on inflation is negligible and statistically insignificant.

Onwiodiokit’s (2005), study on fiscal deficits, inflation and output growth in Nigeria, adopted a vector error correction model approach. The result showed monotonically decreasing relationship with prices with some lags. The result is at variance with the popular view in the literature that seems to suggest that fiscal deficits necessarily inflationary. Ukoha, (2007) applying the techniques of OLS and ADF test on a time series data investigated the relative price variability and inflation evidenced from the agricultural sector in Nigeria. The result showed that the effect of inflation on relative prices variability is non neutral for both food crops and cash crops. He concludes that there is a significant positive impact of inflation on price variability in both short and long run.

Agayev (2011) analyzes the determinants of inflation rate for the long-run and short-run inflation in 10 CIS transition economies countries over the period 1996 – 2008 using time series data. Regression technique has been used. Inflation, wages, money supply, exchange rate are consider variables. Result shows that increase in exchange rate and wage growth rate are not cause of inflation but monetary policy effects inflation in short run and vice versa in long run.

### 2.3. Inflation and Economic Growth in the Democratic era in Nigeria

At the takeoff of the second democratic dispensation, the GDP grew by 3.9 percent to 3.9 percent respectively in 1999 and 2000. The demand for foreign exchange persisted, precipitating further depreciation of naira exchange rate. This pushed the inflationary trend to move from a single digit of 6.9 percent in 2000 to 18.9 percent at the end of 2001. The monetary aggregate expanded due to expansionary fiscal operations of government. The major problem of monetary policy was excess liquidity.

In 2002, the overall GDP growth rate slowed down due to sharp contraction in oil sector production. The GDP recorded 3.3 percent growth, the rate of inflation accelerated to 12.9 percent in 2002. The monetary policy focus on CBN changed to two-year period rather than the one year period used hitherto. This was informed by the fact that policy actions affect the ultimate objectives of policy with a substantial lag. The monetary policy of the period remained tight. But due to excess liquidity in the banking system and expansionary fiscal operations of the government, the monetary aggregate exceeded that of year 2001. The inflation rate dropped due to proactive monetary stance and good agricultural harvest. The GDP in 2003, measured at 1990 constant basic prices grew by 10.2 percent. The inflation rate was put at 14 percent. This was attributed to rapid built-up in aggregate demand reinforced by the impact of the deregulation of the downstream sector of the petroleum industry which increase the pump price of petroleum product with great consequences on the transportation and production costs. The naira depreciated against the USA dollar. This resulted in rapid acceleration in monetary growth.

In 2004, GDP growth was 6.1 percent, while inflation rate decelerated at 10 percent from 23.8 percent as at 2003. This follows from the adoption of non-expansionary fiscal and monetary policy and growth in food crops. At as 2005, the economy made some positive macroeconomic outcomes. The monetary aggregate policy targets were achieved. Inflation fell from 15 percent in 2004 to 11.6 percent in 2005. The exchange rate of naira remained stable but further appreciated. By 2007 the GDP growth rate was 6.2 percent compared to 6.0 percent in 2006. The main growth drivers were agriculture, general commerce and service, sound monetary, fiscal and credit policies. The inflation rate dropped to 6.6 percent compared to 8.5 percent recorded in 2006. The economic performance of 2008 was better compared to 2007. The GDP grew by 10.4 percent, and the inflation rate however increases to 15.4 percent.

### 3.0 Methodology

The analytical tools and technique employed for this work includes: the unit root test to remove spurious results of the variables, co-integration test to find out if the variables (i.e.
dependent and explanatory) have long run relationship and a VAR model estimation. Other test employed includes the t- test, the R-squared and the F-test. The entire test is base on 5 percent level of significance (LOS).

3.1 Model specification

The model specification follows a multiple regression model specified under the vector Auto regression (VAR) principles. This is due to the fact that there exist a bi-directional relationship of the variables for the study. The VAR is preferred to ordinary least square (OLS) because the variables for the study are interdependent. Hence, such a relationship cannot be adequately captured via OLS specification.

The model VAR is specified with 2-lag as follows:

\[
\begin{align*}
\Delta CPI_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(1)}
\end{align*}
\]

\[
\begin{align*}
\Delta EXRT_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(2)}
\end{align*}
\]

\[
\begin{align*}
\Delta GDE_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(3)}
\end{align*}
\]

\[
\begin{align*}
\Delta IMPCT_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(4)}
\end{align*}
\]

\[
\begin{align*}
\Delta GDP_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(5)}
\end{align*}
\]

\[
\begin{align*}
\text{MS}_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(6)}
\end{align*}
\]

\[
\begin{align*}
\text{PMS}_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(7)}
\end{align*}
\]

\[
\begin{align*}
\text{LR}_t &= \Omega_0 + \psi_1 \sum_{i=1}^{t-1} CPI_{i+1} + \delta_1 \sum_{i=1}^{t-1} GDP_{i+1} + \lambda_1 \sum_{i=1}^{t-1} IMPCT_{i+1} + \\
&+ \Phi_1 \sum_{i=1}^{t-1} LR_{i+1} + \beta_1 \sum_{i=1}^{t-1} EXRT_{i+1} + U_1 \quad \text{(8)}
\end{align*}
\]

where the variables are:

\begin{align*}
\text{CPI}_t &= \text{inflation rate at period } t, \\
\text{GDP}_t &= \text{nominal domestic product at period } t-1, \\
\text{MS}_t &= \text{broad money supply at period } t-1, \\
\text{EXR}_t &= \text{exchange rate at period } t-1, \\
\text{IMP}_t &= \text{import at period } t-1, \\
\text{GOVT}_t &= \text{government deficit at period } t-1, \\
\text{PMS}_t &= \text{Petroleum Motor Spirit at period } t-1, \\
\text{LR}_t &= \text{Interest rate at period } t-1, \\
\text{U}_t &= \text{error term}
\end{align*}

Apriori expectation becomes

\[
\psi_1 > 0, \delta_1 > 0, \lambda_1 > 0, \theta_1 > 0, \omega_1 > 0, \alpha_1 > 0, \Phi_1 > 0, \beta_1 > 0
\]

4. Data presentation and Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Levels</th>
<th>1% difference</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI</td>
<td>-6.044963</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>4.958384</td>
<td>1(0)</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>-6.460519</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>GDE</td>
<td>-5.854626</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>IMPC</td>
<td>-5.854626</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>EXRT</td>
<td>-5.038105</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>LR</td>
<td>-5.170673</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>PMS</td>
<td>-3.540125</td>
<td>1(2)</td>
<td></td>
</tr>
</tbody>
</table>

1% Critical -3.6852
The stationary test result of the time series variables using the Augmented Dickey Fuller (ADF) unit root test approach shows that only Inflation rate (CPI), Government Deficit Expenditure GDE, Money supply (MS), Import Cost (IMPC), Exchange rate (EXRT) and Lending Rate (LR) are found to reject the null hypothesis of no stationary at level and this implies that the time series variables are relatively stable and integrated of order one. While other time series variables, like nominal Gross Domestic Product (GDP) is stationary at levels, whereas Petroleum Motor Spirit (PMS) is stationary at second differencing to make it stationary. This implies that CPI, MS, GDE, IMPCT, EXRT and LR data are not stable at levels but stable at first difference.

Since, the incorporated variables in this study are not of the same order of integration; we assume the same level of stability in the data distribution pattern i.e. the same order of integration for the subsequent tests. Otherwise, the long-run relationship would not be established excluding the short-run analysis which does not require the same order of integration.

Table 2. Co-integration result test

<table>
<thead>
<tr>
<th>Eigen value</th>
<th>Likelihood Ratio</th>
<th>5% Critical Ratio</th>
<th>1% Critical Ratio</th>
<th>Hypothesized No. of CE(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.996297</td>
<td>478.3932</td>
<td>156.00</td>
<td>168.36</td>
<td>None **</td>
</tr>
<tr>
<td>0.995068</td>
<td>321.6346</td>
<td>124.24</td>
<td>133.57</td>
<td>At most 1 **</td>
</tr>
<tr>
<td>0.995134</td>
<td>172.9002</td>
<td>84.15</td>
<td>103.18</td>
<td>At most 2 **</td>
</tr>
<tr>
<td>0.731761</td>
<td>81.6760</td>
<td>68.52</td>
<td>76.07</td>
<td>At most 3 **</td>
</tr>
<tr>
<td>0.554663</td>
<td>44.8320</td>
<td>47.21</td>
<td>54.46</td>
<td>At most 4</td>
</tr>
<tr>
<td>0.378094</td>
<td>22.1821</td>
<td>29.68</td>
<td>35.65</td>
<td>At most 5</td>
</tr>
<tr>
<td>0.189338</td>
<td>8.883078</td>
<td>15.41</td>
<td>20.04</td>
<td>At most 6</td>
</tr>
<tr>
<td>0.101787</td>
<td>3.005748</td>
<td>3.76</td>
<td>6.65</td>
<td>At most 7</td>
</tr>
</tbody>
</table>

*(**) denotes rejection of the hypothesis at 5% and 1% level of significance, LR indicates 4 co-integrating equation(s) at 5% significance level.

To ascertain whether the variables to maintain a long run equilibrium relationship, table 3 shows the result of Johanson co-integrating tests. We have 4 co-integrating equations with their Eigen values greater than 0.5 and their likelihood ratio greater than the critical value both at 5% and 1% significant level.

This result shows that the variables can be used in regression without fear of obtaining spurious result.

Also, the result of the co-integration shows that CPI, EXRT, GDE, IMPC were all integrated at order *(**). This implies that all the variables were statistically significant at 5 percent and 1 per cent respectively.

Table 3. VAR Estimation Result

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-2.563947</td>
<td>19.1015</td>
<td>-0.13423</td>
</tr>
<tr>
<td>CPI</td>
<td>1.269678</td>
<td>2.04259</td>
<td>0.62160</td>
</tr>
<tr>
<td>EXRT</td>
<td>-0.967367</td>
<td>0.84604</td>
<td>-1.14340</td>
</tr>
<tr>
<td>GDE</td>
<td>-839.597</td>
<td>33769.1</td>
<td>-0.24871</td>
</tr>
<tr>
<td>IMPC</td>
<td>-5090.504</td>
<td>3130.29</td>
<td>-1.62621</td>
</tr>
<tr>
<td>GDP</td>
<td>0.119887</td>
<td>0.07814</td>
<td>1.53433</td>
</tr>
<tr>
<td>MS</td>
<td>104859.9</td>
<td>308965.9</td>
<td>3.39687</td>
</tr>
<tr>
<td>PMS</td>
<td>0.672133</td>
<td>0.30826</td>
<td>2.18038</td>
</tr>
<tr>
<td>LR</td>
<td>-0.206473</td>
<td>0.46350</td>
<td>-0.44547</td>
</tr>
</tbody>
</table>

| R-Squared | 0.942250     | 5.42E+30       |
| R^2 Adjusted | 0.858249            | -1308.599    |
| Sumsquared resid. | 5473.803     | 59.24963      |
| S.E Equation | 22.30736    | -103.1857     |
| F-Statistic | 11.21720    | 103.1857      |
| Log likelihood | 113.5876     | 103.1857      |
| Akaika AIC | 9.327687    | 103.1857      |
| Schwarc | 10.13653    | 103.1857      |
| Schwarz Criteria | 0.69564     | 109.6564      |

4.1 Result Discussions

The Estimated Equation is:

\[
\text{CPI}t = -2.563947 + 1.269678 \text{CPI}t-1 + 0.119887 \text{GDP} t-1 - 839.597 \text{GDE} t-1 + 1048599 \text{MS} t-1 + 0.672133 \text{PMS} t-1 - 0.206473 \text{LR} t-1 - 0.967367 \text{EXRT} t-1
\]

The result form the estimated equations (9) shows that the sign of coefficient GDP, PMS and MS are positive which conform to the apriori expectation while the sign of the coefficient of IMPCT, GDE, LR and EXR are negative. This implies that CPI increases with higher GDP, MS and decreases with lower IMPCT, GDE, LR and EXR. In terms of magnitude, it implies that every 1Nillion increase in GDP will on average lead to N 0.119887 increase in CPI holding other explanatory variables constant. On the other hand,
every 1% increase in Import Cost (IMPCT), on average lead to N5,090.504 decrease in CPI holding other variables constant.

Meanwhile, considering the statistical significance of the variables judging from the t-statistic only MS and PMS are individually significant the rest of the variables are not statistically significant.

R-squared statistic shows that explanatory variables in the model (GDP, GDP, PMS, MS, LR, GDE and EXR) account for about 94.2 percent of the variation in the dependent variable (CPI). Thus, the explanatory power of the model is high and appears to suggest that the included variables are good predictors of CPI.

Adjusted R-squared 85.8%, being very close to the R-squared implies that there is less penalty for irrelevant variables in the model.

F-statistic (11.21720) being significant implies that though the model is individually statistically insignificant but jointly or simultaneously it the model is statistically significant hence it shows that the overall goodness of fit of the model is satisfactory.

4.2 Test of hypothesis

The hypothesis of the study is restated thus:

$$H_0: \text{There is no significant relationship between inflation and money supply in Nigeria}$$

The t-statistic reveals that Tcal = 3.39687 > Ttab = 2.756 Since the value of tcal is greater than t tab we reject the null hypothesis and accept the alternate hypothesis and conclude that money supply has a significant relationship with inflation in Nigeria.

$$H_0: \text{There is no significant relationship between variables (such as GDP, government deficit, import cost, exchange rate, lending rate and Petroleum Motor Spirit) and inflation in Nigeria.}$$

The t-statistic of all the variables are Tc = 0.62160 < Tt = 2.756; Tc = -1.14340 < Tt = 2.756, Tc = -0.24871 < Tt = 2.756, Tc = -1.62621 < Tt = 2.756, Tc = 2.18038 < Tt = 2.756 and Tc = -0.44547 < Tt = 2.756 Since the value of tcal is smaller than ttab we accept the null hypothesis and conclude that there is no significant relationship between variables (such as GDP, government deficit, import cost, exchange rate, lending rate, and Petroleum Motor Spirit) and inflation in Nigeria.

4.4 Conclusion/Recommendations

The study concludes that inflation in Nigeria as witness in other countries is motivated by the variation in monetary variables. This confirms the noble stance of the monetarist that inflation is everywhere a monetary phenomenon.

Therefore, the following policy recommendations are made.

The Central Bank of Nigeria should adopt a number of measures to control the quality and quantity of credit. Such as raise the bank rate, sell securities in the open market, raise the reserve ratio, and adopt some selective credit control measures such as raising margin requirements and regulating consumer credit, demonetize currency of higher denominations.

The government should display a high sense of transparency in the fiscal operations to bring about realistic fiscal deficits. Fiscal deficits, where recorded should be channeled to productive investment like road constructions, electricity provision and other overheads that will serve as incentives to increase productivity and high Gross Domestic Product (GDP).

Efforts should be made by the government to ban the importation of some goods and services in the country that are not essential. This will encourage the consumption of made in Nigeria goods. Hence, boosting employment generation and completely discouraging the introduction of cross-border inflation in Nigeria.

To reduce exchange rate, the foreign exchange market should be policed to ensure that only those who have the aim to add value to the real sector get attention. This among other steps would at least value the naira against major world currencies, and leave us with only the prices increases occasioned by increase in local money supply.

REFERENCES


