

## **The Impact of Money Supply on Inflation in Nigeria (1980 – 2009)**

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**ABSTRACT:** *This study examined the impact of money supply on inflation in Nigeria between 1980 and 2009, using Vector Error Correction Mode (VECM). The data for the variables were sourced from CBN statistical Bulletin. The results of the test established a significant long run positive relationship between money supply and inflation in Nigeria. Based on this finding, the study recommended that, government intensify the effort to combat inflation by encouraging the monetary authority to put in place policies measures that are gear toward reducing the volume of money in circulation in Nigeria.*

**KEYWORDS:** Money Supply, Inflation, VECM, Nigeria

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### **INTRODUCTION**

The maintenance of price stability is one of the main objectives of Macroeconomic Management (CBN, 1998). In other to achieve this, the monetary authority needs to control the amount of money in circulation through the use of monetary instrument such as bank lending rate, reserve requirement and so on, monetary policy has been defined as an action of the monetary authority to influence the quantity, cost and availability of money credit in order to achieve desires macroeconomic objectives of internal and external balances (CBN, 2011). While inflation on the other hand, has been described as persistence and appreciable increase in general price level of goods and services over a period of time (Jhingan, 2002). However, it is not in every case that an increase in price level of goods and services could be referred to as inflation. Thus, for an increase in general price level is regarded as inflation. Therefore, for an increase in price level to be regarded as inflation, such an increase must be constant, enduring and sustainable. For inflation to occur therefore, the price level should affect almost every commodity and should not be temporal.

Inflation has been identified as one of the numerous problems facing developing countries Nigeria inclusive, which needed to be curtailed. Over the years, rate of inflation has been on increasing side with its damaging effects on the Nigerian economy through the movement of price of consumer's goods and services. Against this background, monetary authority in Nigeria has put-in-place various monetary policy measures with the main objective of bringing inflation under control. Despite this, inflation in Nigeria has continually been on increasing side over the years.

There are controversies in the literature on whether an increase in money supply fuels inflation or not. Some of the researchers such as Oladapo and Akinbobola(2011), Imimole and Enoma (2011); Arikawe (2002); Lozano (2008) and Obadan (2010) are of the opinion that, increase in money

supply leads to an increase in the rate of inflation and these. While some other researchers like Karras (1994); Dehaan and Zelhoret (2001); Aliyu and Eglame (2009) and Vansteenkiste (2009) argued that, increase in money never lead to inflation. In light of this, one cannot categorically state that, an increase in money supply will fuel inflation or not, or will have negative or positive impact on inflation in Nigeria. For instance, money supply increases by 11.95 and 15.20 per cent in 1982 and 1983 respectively, while inflation during the same period was 7.7 and 23.2 per cent respectively. However, when money supply falls by 15.40 and 11.93 per cent in 1983 and 1984 respectively, inflation rate stood at 23.20 and 39.60 per cent in 1983 and 1984 respectively.

The trend of inflationary rate and money supply in Nigeria that had just been analysed above has brought to question that real impact of money supply on inflation in Nigeria. Hence, this research seeks to examine the impact of money supply on inflation in Nigeria over the period of 29 years (1980-2009). The study provides an avenue for more critical appraisal of the impact of money supply on inflation in Nigeria by including growth in budget deficit and government debt as some of the variables that are missing in all the past studies. Variable such as inflation rate, growth rate of money supply, growth rate of budget deficit and growth rate of government debt will be used in the methodology of this research.

## **REVIEW OF EMPIRICAL LITERATURE**

The impact of money supply on macroeconomic variable performance such as inflation has gained considerable pronouncement in Literature, where many developing countries including Nigeria are making financial efforts to ensure price stability in order to promote economic growth. Nyong and Odubeleon (2002) looked at the effect of monetary financing of budget deficit on microeconomics stability in Nigeria, using the following variable in their methodology, inflation, gross domestic product, money supply and exchange rate. The results show that, increase in money supply through monetary financing of fiscal deficit is one of the factors contributing to macroeconomic stability in Nigeria. Imimole and Enoma (2011) employed autoregressive distributed lag. The results show that exchange rate appreciation, money supply and real gross domestic product were the main determinants of inflation in Nigeria and naira depreciation has positive and significant long-run effect on inflation in Nigeria. Oladipo and Akinbobola (2011) used pair-wise granger causality test in determining the causal relationship among the variables. The results showed that no causal relationship from inflation to budget deficit was found. However, causal link from budget deficit to inflation was established in Nigeria. Again, Chimobi and Igwe (2010) examine the casualty among budget deficits, money supply growth and inflation, using vector error correction model (VECM) and pair-wise granger casualty test. They found that, inflation and budget as a proxy for increase in money supply have bilateral/feedback link.

### **Theoretical Framework**

#### **Fisher's Quantity Theory of Money**

The Fisherian approach was developed by the classical economists but was well developed and expanded by Irvin Fisher in 1911. He summarized a given economy in what is known as equation

of exchange. From the equation, the circulation of money stock is related to the amount of money expended in the economy during a given period of time. According to the theory assuming that average price of a given commodity say the other commodity is  $p_1$  and the quantity sold of the same commodity is  $q_1$ , the total expenditure on that commodity is equal to  $p_1q_1$ . Suppose we have  $k$  commodities in the economy.

$$\Sigma pq = p_1q_1 + p_2q_2 + \dots + p_kq_k \dots \dots \dots \text{eqn.1}$$

$$\Sigma p_1q_1 = PQ \dots \dots \dots \text{eqn.2}$$

Where  $p$  is index of price of goods sold,  $q$  is index of quantity of goods sold and  $PQ$  is the total monetary expenditure on goods. The average turnover of money in the process of exchange these goods will be equal to

$$V = \frac{PQ}{M} \dots \dots \dots \text{eqn.3}$$

Where the velocity of circulation,  $M$  is total money stock.

$$MV = PQ \dots \dots \dots \text{eqn.4}$$

It is assumed that an increase in the supply of money ( $M$ ) will in general not affect the velocity of circulation ( $V$ ) or the volume of transaction ( $Q$ ) at full employment level.

Hence, price level ( $p$ ) will vary directly with the quantity of money ( $M$ )

$$P = f(M) \dots \dots \dots \text{eqn.5}$$

## METHODOLOGY

The goal of this paper is to ascertain if increase in money supply will fuel inflation or not in Nigeria. The most common empirical method to examine the impact of money supply on inflation has been to employ a single equation model, treating rate of inflation as dependent variable and money supply as independent variable. In this study, the model specification of inflation mirrors the work of Oladipo and Akinbobola (2011) with little modification.

The model specification considers the following variables rate of inflation (INF), Money supply (Ms), Budget Deficit (BD) and Government Debt (GD).

The model specifies thus,

$$INF = f(MS, BD, GD) \dots \dots \dots \text{eqn.6}$$

Putting it in an explicit form:

$$INF = \alpha_0 + \alpha_1MS + \alpha_2BD + \alpha_3GD + U_t \dots \dots \dots \text{eqn.7}$$

Where  $\alpha_1$ ,  $\alpha_2$ , and  $\alpha_3$  are the coefficient of MS, BD and GD respectively while  $\alpha_0$  is the constant value that represents intersect. The data for these variables are sourced from statistical bulletin and annual report and statement of account published by Central Bank of Nigeria (CBN) between the period of 1980 and 2009. In order to achieve the objective of the research which is to examine the impact of money supply on inflation in Nigeria, Vector Error Correct Model (VECM) is used as estimating techniques.

## RESULT AND DISCUSSION OF THE FINDINGS

**Table 1.1 Descriptive Statistic Data of the Variables**

Variable	Observation	Mean	Median	Maximum	Minimum	Std Deviation
INF	30	20.75	12.95	72.80	5.4	18.28
Ms	30	147.3640	23.52	1040.23	-87.85	26880101
BD	30	-97459	51.44	2569.79	6.49	161679.7
GD	30	1776905	20.04	1155.76	-83.76	1955603

**Source: Computed from Data 2012**

Because of the high variability exhibited by the variables as it is shown in table 1.1 which is due to fact that the variables are not measured by the same unit, the growth rate of each variable was used.

**Table 1.2 Correlation Matrix of the Variable**

	INF	GD	BD	Ms
INF	1.0000			
GD	0.2814	1.0000		
BD	0.2458 (0.3207)	0.62 (0.0001)	1.0000	
Ms	0.311 (0.1905) (0.01)	0.51 (0.00042)	0.665 (0.0001)	1.0000

**Source: Computed from Data 2012**

The results in table 1.2 show that only three correlation coefficients among the variables are significant. The results show that money supply has positive and significant relationship with inflation. The results in table 1.2 are not conclusive on their own but give us guide to the degree and nature of the relationship among the selected variables.

### Unit Root Test

$H_0$ : there is unit root

**Table 1.3: Phillips-Perron Test at Level**

Variable	Phillips-Perron test statistics	Critical Value (1%)	Critical Value 5%	Level of Integration
INF	-2.649923	-3.679322	-2.967767	Non stationary
Ms	-5.369509	-3.679322	-2.967767	1(0)
BD	-4.647353	-3.679323	-2.967767	1(0)
GD	-5.961693	-3.679322	-2.967767	1(0)

Source: Computed from Data 2012

H<sub>0</sub>: there is no unit root

**Table 1.4: KPSS unit Root Test and Level**

Variable	LM Test Statistics	Critical Value (1%)	Critical Value 5%	Level of integration
INF	0.1814	0.7390	0.4630	1(0)
Ms	0.2495	0.7390	0.4630	1(0)
BD	0.1876	0.7390	0.4630	1(0)
GD	0.1443	0.7390	0.4630	1(0)

Source: Computed from Data 2012

This paper makes use of Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) to test for the unit root for the variables in the model. The results are presented in table 1.3 and table 1.4 respectively. The null hypothesis (H<sub>0</sub>) for Phillips-Perron test is that, there is a unit root in each variable. This means that, each variable was stationary at level. The rule of thumb for PP test is that, the null hypothesis of unit root should be accepted if the Phillips-Perron statistic is less negative and greater than critical value.

The result of Phillips-Perron test shows that all variables are stationary at level except inflation. The implication of the result is that we cannot proceed to co-integration technique. Hence, further test is carried out by using KPSS. In the case of KPSS, the null hypothesis (H<sub>0</sub>) is that, there is no unit root. The rule of thumb for KPSS is that the null hypothesis of no unit root be accepted if LM (KPSS) statistics is less than the critical value and the result shows in table 1.4 that all the variables are stationary at level which means we can now proceed to co-integration technique.

$$INF = 0.0015 MS + 0.0123 BD + 0.1424 GD \dots \dots \dots \text{eqn.8}$$

(0.0170)                      (0.0160)                      (0.0068)

The results from normalized coefficient in eqn. 8 shows there is long-run positive and significant relationship between money supply and inflation in Nigeria. This implies that an increase in money supply in Nigeria will fuel the rate of inflation. From eqn .8, an increase in money supply by one will lead to an increase in the rate of inflation by 0.015. The result also shows that budget deficit and government debt are all having direct impact on inflation and this impact is confirm to be significant according to the level of probability in the eqn.8

## CONCLUSION

Empirical evidence from the paper has shown that there is a positive and significant relationship between money supply and inflation in Nigeria. This whatever, there is an increase in money supply, the rate of inflation is a diversely affected by fuelling inflation in line with the empirical finding of the research work. Hence, to reduce the level of inflation and ensure price stability in Nigeria, the monetary authority needs to regulate the amount of money supply into the Nigerian economy. Therefore, should government intensify the effort to combat inflation by encouraging the monetary authority to put in place policies measures that are gear toward reducing the amount of money in circulation?

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