

# Does Fiscal Deficit Granger Cause Instability in Inflation Rate in Nigeria: A Bivariate Causality Approach?

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## Abstract

This study examines the direction of causality between fiscal policy and inflation volatility in Nigeria for the periods 1981 to 2014. Secondary quarterly time series data on fiscal deficit and consumer price index (measure of inflation rate) from 1981:1 to 2013:3 were used for the study and obtained from the central bank of Nigeria statistical bulletin 2014 while the volatility data is generated through GARCH method. The data collected was analyzed using the Pairwise Granger Causality Test. The findings of the study show that there is bi-directional causality between fiscal deficit ( $F - statistic = 5.86 \text{ \& } 3.96; P < 0.05$ ) and inflation volatility. Thus, volatility in inflation rate is traceable to the persistent nature of the excess government expenditure over revenue of the Nigerian economy and vice versa. The study therefore recommends that appropriate policies should be put in place to check the extra budgetary expenditure of the government since they have been found to be inflationary and also, excess supply of money that results in inflation should as well be controlled by the government to prevent artificial inflation rate that could cause increase in expenditure.

**Keywords:** Inflation Volatility, Fiscal Deficit, GARCH, Bivariate Granger Causality Test

**JEL Classification:** E 31, E62

## 1. Introduction

Over the years, studies have argued on the reason why either developed or developing countries have found it difficult to maintain single digit inflation rate and this has been a major macroeconomic problem of achieving steady growth in the world economy. Meanwhile, a steady and single digit inflation rate enhances the growth rate of the economy irrespective of her structure. However, the major cause of disparities in the figure of inflation rate is subject to different opinions. The quantity theory of money by Irving fisher is of the belief that increase in money supply leads to inflation while the classical economists are of the view that increase in money supply at full employment level leads to increase in price level while increase in money supply does not increase output or create employment but rather leads to an increase in the price level.

Opposing the classical position is Keynes who argued that increase in money supply increases aggregate demand and supply, and creates employment opportunities. This was why he recommended government intervention in terms of fiscal deficit during the great depression. Keynes believed that there is need for some form of government intervention in an economy in order to achieve macroeconomic objectives. This government intervention comes inform of fiscal policy which entails the use of the government's expenditure, taxation and its borrowing policies to achieve macroeconomic objectives like full employment of resources, price stability and host of others. Hence, government uses her fiscal deficit to evaluate the direction of any economy's fiscal policy. Huge fiscal deficit which results from an increase in government spending relative to the revenue generated have been recorded over the years in Nigeria. The economic consequences of this deficit could be severe for a nation that lacks the required management abilities. Similarly, fiscal deficits could escalate the supply of money in an economy and when there is excess money supply it can result to higher general price level which may have negative effect on the purchasing power per unit of money spent i.e. the amount of goods and service that a naira can purchase becomes reduced.

Both inflation and fiscal deficits are major macroeconomic problem which are associated with developing countries however despite the much attention that inflation has attracted, one area that has remained vague and has received little or no attention is the volatility in inflation rate in one hand and the direction of the relationship between fiscal deficit and fluctuations in inflation rate on the other hand. Volatility in inflation rate is the fluctuations, instability and flexibility in the inflation rate. The Nigerian inflation rate has been unstable in recent times that no two consecutive years sequentially have been recorded to have the same inflation rate (CBN, 2014). According to Rother (2004) high volatility of inflation over time raises price level uncertainty, raises costs for hedging against inflation risks and leads to unanticipated redistribution of wealth.

Thus, inflation volatility can impede growth even if inflation on average remains restrained. In the literature. Studies in Nigeria have focused on fiscal deficit-inflation relationship and their findings have been contradicting . Studies like( Oyejide, 1972; Adeyeye and Fakiyesi, 1980; Osakwe, 1983; Asogu, 1991; Onwioduokit, 1999; Oladipo and Akinbobola, 2011; and Medee &Nenbee, 2012) believe that there exist a relationship between fiscal deficit and inflation. On the other hand, some studies that have built on the Ricardian equivalence hypothesis and found either no correlation or only a weak correlation between fiscal deficits and inflation (Niskanen, 1978; McMillin & Beard, 1982; Ahking & Miller; 1985 , Barro, 1989, Landon & Reid

1990; Fiani 1991).

Basically, volatility in inflation has been barely considered in Nigeria. Studies that have considered inflation volatility in Nigeria have focused on its relationship with other variables like trade openness, economic development. (See Fielding, 2008). Basically since volatility in inflation poses more threat than inflation on the average and this volatility is noticeable in the Nigerian inflation rate (see figure 1 below) there is need to determine whether it is caused by fiscal deficit. Similarly, large deficits are now the addictive nature of the federal government leading to instability and increase in the amount of deficits incurred on yearly basis. Therefore, the existence of fiscal deficit- inflation relationship has been supported by some studies in Nigeria (see Oladipo & Akinbobola, 2011; Onwidiokit, 1999; Ezeabasili et al 2012) but the direction of its causality has been mixed in the literature. This study intends to fill this gap using Nigerian data from 1981 to 2014.

## 2. Literature Review

A number of research works have been conducted on fiscal deficit and inflation rates in developed, developing and the Nigerian economy in particular. Hermantha (2012) examines the validity of the hypothesis that suggests that there is a link between fiscal deficit and inflation in Sri-Lanka and he discovers that a one percent point increase in ratio of fiscal deficits to narrow money is associated with about an eleven percent point increase in inflation. However, he concludes that the inflation in Sri Lanka was not only a monetary phenomenon. Catao & Terones (2005) use a dynamic estimation method for 107 countries and they discover that there is a strong and positive relationship between fiscal deficits and inflation.

A study by Fischer et al (2002) classified a sample of 94 countries into high-inflation and low-inflation countries. They show that fiscal deficits are main drivers of inflation. They also find that a change in budget balance has no significant effect on inflation in low inflation countries. Alfrin (2013) examines the fiscal-deficit inflation relationship in Bangladesh and she discovers that fiscal deficit has an effect on inflation and she however suggests that demand management policies such as government revenue and expenditure have an important role in controlling inflation. Habibulah et al (2011) examines the long-run relationship between budget deficits and Inflation in thirteen developing Asian countries, namely; Indonesia, Malaysia, the Philippines, Myanmar, Singapore, Thailand, India, South Korea, Pakistan, Sri Lanka, Taiwan, Nepal and Bangladesh. Annual data for the period 1950 – 1999 was used and co-integration, the error-correction model approach and the Granger causality tests were applied on the data. The study shows that budget deficits are inflationary in the thirteen developing Asian countries examined by the study. Fianni (1991) discovers that inflation tends to be subdued despite the presence of large budget deficit in Morocco. However, his findings were contradictory to the theoretical postulation that budget deficit has an effect on inflation.

Rother (2004) examines the effect of discretionary fiscal policies on inflation volatility in range of OECD countries between 1967 and 2001. The empirical results suggest that volatility in discretionary fiscal policy has contributed to volatility in inflation. Ramona (2011) examines the impact of fiscal policy on inflation volatility in Romania during the economic crises context and he discovers that budget deficit has quite a powerful impact on inflation volatility and the study suggests that a limited budget deficit would be a good measure for maintaining price stability.

In Nigeria, Ezeabasili et al (2011) examine empirically the fiscal deficit- inflation relationship during the period of persistent inflationary trends i.e. from 1960 -2006. They adopt a modeling which incorporated the co-integration technique as well as the structural analysis and discover that there is a positive but insignificant relationship between fiscal deficit and inflation in Nigeria. However, they specify that past levels of deficit do not have any positive or significant role to play with respect to inflation. Oladipo & Akinbobola (2011) examine the relative causal relationship between budget deficit and inflation as well as the economic implications of fiscal deficit financing in Nigeria and their findings however suggest a uni-directional causality between inflation and budget deficit in Nigeria. The study recommends that monetary policy should be made to complement fiscal policy measures. Also there was need for fiscal discipline to be maintained at every level of government.

Onwidiokit (1999) examines the nature of causality between fiscal deficit and inflation i.e. whether inflation causes fiscal deficit or fiscal deficit causes inflation and the empirical findings confirm that fiscal deficit /gross domestic product (which proxied the absorptive capacity of the economy) causes inflation however, there empirical results did not confirm a feedback effect between inflation and fiscal deficit in absolute terms. Abel and Olalere (2012) examine whether budget deficit was inflationary or not in Nigeria within the period of 1980 to 2009. The study made use of time series data and employed vector Error correction Mechanism (VECM) to determine the correlation that existed between the two macroeconomic variables. The study also investigated the existence of long run relationship between budget deficit and inflation. The findings of the study suggest a uni-directional causality between budget deficit and inflation. The study recommends that government should cut down its expenditure in order to keep the inflation rate low and when fiscal deficits were to be incurred it should be channeled to productive investments in the country.

### 3. Methodology and Empirical Results

This study adopted the Keynesian theory of inflation for analyzing the direction of causality between fiscal deficit and inflation volatility in Nigeria. The Keynesian theory is a short run analysis theory. It is based on the assumption that there exist unemployed resources in the economy. Fiscal deficit can be linked to inflation under the Keynesian theory since it supports the use of fiscal deficit to sustain the economy in periods of economic meltdown (recession), Keynes advocated fiscal deficit i.e. excess spending relative to revenue generated in an economy in periods of recession. Also, the fiscal deficit advocated by Keynes if not properly channeled into productive activities in an economy could aggravate inflation.

#### 3.1 Model on Causality

To examine the causal relationship between fiscal deficit and inflation volatility using the VAR model, a pairwise granger causality test is utilized. The advantage of this model is that it allows any variable to have the tendency of being a dependent or independent variable. The model is specified as follows:

$$U(\text{VAR}) = (\text{FID}, \sigma^{INF}) \dots\dots\dots(1)$$

$$\sigma^{INF}_t = \sum_{i=1}^n \alpha_{11} \sigma^{INF}_{t-1} + \sum_{i=1}^n \alpha_{12} \text{FID}_{t-1} + u_t \dots\dots\dots(2)$$

$$\text{FID}_t = \sum_{i=1}^n \alpha_{21} \text{FID}_{t-1} + \sum_{i=1}^n \alpha_{22} \sigma^{INF}_{t-1} + u_{2t} \dots\dots\dots(3)$$

Where FID represents fiscal deficit,  $\sigma^{INF}$  stands for variance of inflation rate and this is used to measure volatility in inflation rate using GARCH (p, q) technique.

#### 3.2 Results and Discussions

The granger causality test results show that there is a bi-directional causality between fiscal deficit and inflation volatility. This indicates that volatility of inflation influences the fiscal deficit while fiscal deficit also influences inflation volatility implying that both variables Granger cause each other. However, the implication of the results is that changes in fiscal policy (measured by fiscal deficit) actually influence the fluctuations in inflation rate in the Nigerian economy. That is, an increase or decrease in the fiscal deficit of the economy is capable of generating instability in the inflation rate.

### 4. Conclusion and Policy Recommendation

Based on the findings of this study, it has been determined that fiscal deficit and inflation volatility have a bi-directional causality. Fiscal deficit influences inflation volatility and inflation volatility also influences fiscal deficit.

Therefore, this study recommends that appropriate policies should be put in place to check the extra budgetary expenditure of the government since they have been found to be inflationary prone. Appropriate combination of the monetary and fiscal policies should be used in other to regulate all unnecessary money supply and channel expenditures to capital projects that would increase investment opportunities and generate economic growth in the long run.

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**Table 1: Empirical Analysis of Bivariate Granger Causality Test**  
**Source: Authors, 2015**

<i>Null Hypothesis:</i>	<i>Obs</i>	<i>F-Statistic</i>	<i>Prob.</i>
<i>FID does not Granger Cause INFV</i>	128	5.86313	0.0037
<i>INFV does not Granger Cause FID</i>		3.96412	0.0215

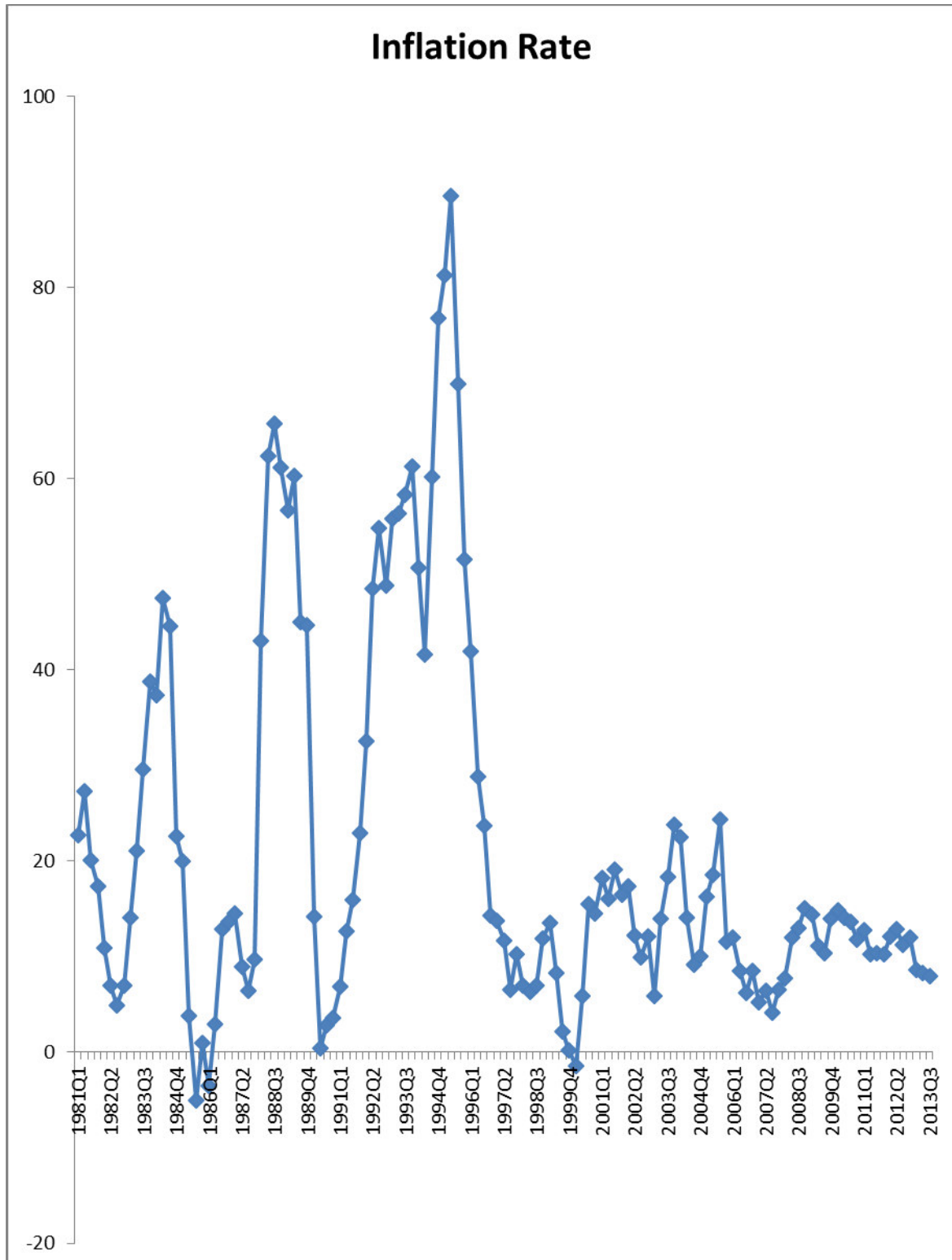


Figure 1: Trend of Inflation Rate in Nigeria, 1981:1-2013:3  
Source: Authors Computation, 2015