European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.7, No.9, 2015

Empirical Investigation of Fiscal deficits and Inflation in Nigeria

Alexander Abraham Anfofum[1] Adabenege Onipe Yahaya[2] Tauhid Suleman[3]
Department of Economics [1] Department of Accounting [2 and 3]
Nigerian Defence Academy PMB 2109 Kaduna
*Email of corresponding author: abrahamlex2@gmail.com

Abstract

The study examined the relationship between inflation and fiscal deficits in Nigeria. Annual time series data spanning 42 years on inflation, fiscal deficits, agriculture, money supply and gross domestic product were sourced from central bank statistical bulletin special edition 2008 and volume 23 of 2012. The study applied unit-root test for stationary test, cointegration, Granger causality and error correction regression analysis. CUSUM and CUSUMQ statistics test was adopted for stability of the model. The study found out that fiscal deficits had a long run equilibrium relationship with inflation. The causality test showed a unidirectional relationship that run from fiscal deficits to inflation. The error correction model estimate reveals that fiscal deficits exert positive pressure on inflation. It was also discovered that the speed of adjustment of the dynamic short run process to long run equilibrium was very slow. The CUSUM and CUSUMQ test revealed that the model is stable. A fiscal management process that encourages increase revenue and reduction of external debt as well as a high practice of transparency in financial obligation will reduce the level of inflation; moreover, increase production of agricultural goods will retard the growth rate of inflation in Nigeria.
Key Word: fiscal deficits, inflation, money supply, agriculture, econometric tools, Nigeria.

1.0 Introduction

The Keynesian economics argued that increase in government deficits cause key changes in the level of tangible macroeconomic variables. Because of this, fiscal deficits resulting from persistent increases in public spending or tax reductions increase aggregate demand and, in the process, result in a rise in the price level of goods and services which in turn increase the cost of investment. Obviously, fiscal deficits are correlated with inflation and increase cost of investment. In Nigeria, fiscal deficit operations have been very unstable causing instability in various macroeconomic variables especially the variables of interest and inflation rates. The presence of fiscal deficits in the Nigerian economy is made possible because of the persistent increase in the cost of financing public activities over the source of generating revenue. This obvious mismatch is one of the reasons for the sustained increase in public debt, depreciating exchange rate and increase disequilibrium in Nigeria's foreign trade relations. These macroeconomic variables explain the behaviour of inflation. For example, increase in government borrowing increase the net credit demands, which in turn triggers up the interest rates and crowd out investment, thus, it is proper to say that fiscal deficits helps to sustain increase in the general price level.

Some studies have demonstrated with painstaking efforts the causal relationship between fiscal deficits and inflation in Nigeria. While, Olusoji and Oderinde (2011) empirical finding showed no evidence of relations, Dockey, Ezeabasili and Herbert (2012) found a positive relationship, but Wosowei (2013) discovered a negative relationship between fiscal deficit and inflation. Furthermore, Onwioduokit (1996), Ozurumba (2012) and Abel and Awe (2012) discovered a positive Granger-causality that run from fiscal deficit to inflation but Wosowei (2013) justify an independent position. All these have made the subject matter polemical, hence the need for further investigation. This study is an attempt to explain the relationship between fiscal deficits and inflation in Nigeria. The study covers the period 1970 – 2012. The paper is separated into five sections. While section one of this study is the introduction, section two concentrate on the review of relevant previous studies of fiscal deficits and inflation. Section three relates to the methodology of the work, whereas section four dwells on the presentation of results and analysis. Finally, section five covers the conclusion and recommendations of the study.

2.0 Literature Review.

2.1 Empirical Literature Review.

Catão, and Terrones (2001) investigated empirically the relationship between fiscal deficit and inflation for 23 emerging market countries during 1970-2000. The study made use of robust dynamic specification that concentrate on the long-run relationship between fiscal deficit and inflation. The authors find that a 1 percentage point decrease in the ratio of fiscal deficit to GDP reduces long-run inflation by 1.5 to 6 percentage points, depending on the size of the inflation tax base.

Onwioduokit (1996) carried out a study on fiscal deficits and inflation dynamics in Nigeria over the period 1970 – 1994. The study concentrated on the causal relationship between inflation and fiscal deficit. The author applied Granger causality test and dynamic structural model of inflation. The result suggests a unidirectional causality from fiscal deficits to inflation. The dynamic structural model of inflation supports the causality test result as the outcome revealed that fiscal deficit contributed significantly to the variation of inflation in Nigeria. Chimobi and Igwe (2010) conducted a research on budget deficit, money supply and inflation in Nigeria. The paper utilizes the Johansen cointegration, vector error correction model (VECM) and causality techniques. The result showed the presence of a positive long-term relationship between inflation and money supply. With regard to the role of the fiscal deficit, the VECM estimates provide evidence that a one percentage point increase in the fiscal deficit (as a share of GDP) leads to an increase of almost 0.94 percentage points in the broad money supply (M_2) growth rate which can trigger inflation. The causality test indicates that inflation and budget deficit had a bilateral/feedback relationship. But Olusoji and Oderinde (2011) investigation of the fiscal deficit and inflationary trend in

Nigeria between the period 1970 – 2006 proved otherwise. The study employed the robust Toda – Yamamato Granger non – causality test. Using annual time series, the result showed no evidence of causality between fiscal deficit and inflation in Nigeria. In another study, Ezeabasili, Mojekwu and Herbert (2012) conducted an empirical analysis of fiscal deficit and inflation over the period 1970 – 2006 in Nigeria. The study applied cointegration test technique and find a positive but insignificant long run relationship between fiscal deficits and inflation. Also, the impulse response and variance decomposition result does not support fiscal deficit as a significant contributor of inflationary trend in Nigeria. The finding does not corroborate Chimobi and Igwe (2010) empirical work.

Ozurumba (2012) investigated the causal relationship between fiscal policy and inflation in Nigeria within the period 1970 – 2009. The study developed the autoregressive distributed lag (ADRL) and causality techniques. The findings showed that fiscal deficit cause inflation, but the ADRL result confirms a negative relationship between fiscal deficit and inflation. Odionye and Ebi (2013) employed cointegration and VECM techniques to empirically examine the relationship between budget deficit and interest rate in Nigeria for the period 1970: 1 – 2010: 4. The estimated result reveals that in the long run co-integrating equation, budget deficit had a positive and significant impact on interest rate. This implies that a high interest rate is a bad signal for inflationary trend. Wosowei (2013) determine to identify the relationship between fiscal deficit and macroeconomic aggregates in Nigeria over the period 1980 to 2010. The study applied the Ordinary Least Square (OLS) regression and Engle Granger causality test procedure. The estimated coefficient of the OLS indicates that inflation and fiscal deficits exert negative influence on economic growth in Nigeria. The causality test showed a bilateral causality relationship between government deficit and gross domestic product, government tax, and unemployment, while there is an independent relationship between government deficit and government expenditure and inflation. Bakare, Adesanya and Bolariwa (2014) conducted a research on fiscal deficit, money supply and inflation in Nigeria within the period 1980 – 2012. The study utilizes cointegration and error correction model instruments. The researchers find a long run equilibrium relationship between the variables in the model. The estimated coefficient of the ECM showed that about 132 per cent of the errors in the short run are corrected in the long run.

Using Turkish annual data and co-integrating vectors, Akay, Alpher and Ozmucur (1996) discovered the presence of a stable long-run relationship between budget deficit, money growth and inflation. In another study, Fischer, Sahay, and Vegh (2002) examined a sample of 94 countries that are high-inflation and low-inflation. The outcome suggests that fiscal deficits consistently trigger inflation in high inflation countries. The study also finds that changes in budget balances does not suggests any significant inflationary effect in low inflation countries, or during low inflation episodes in historically high-inflation countries.

Sill (2005) maintains that monetary policy and fiscal policy are closely connected because money growth in the form of seigniorage provides revenue for the fiscal branch of government. Sill discovered a very little evidence between fiscal deficits and inflation in the United States, but the relationship was strong in developing countries, which according to him, was due to the method of financing the deficits. Barro (1989) maintain that budget deficit increase growth of money supply and inflation. This is supported by the work of Islam and Wetzel (1991) in Ghana which conclude that financing of deficit by money creation triggers inflation. Furthermore, Njeru and Randa (1998) study on macroeconomic implication of fiscal deficitsl in Kenya lend support to Barro (1989) and Islam and Wetzel (1991), when it concluded that financing of deficit via increase in monetary policy instrument stimulates inflation. Darrat (2000) used an error correction model (ECM) to find whether high budget deficits have inflationary consequences in Greece given the period 1957-1993. The outcome of the estimated ECM indicated that deficit variable exert a positive and significant influence on inflation in Greece.

3.0 Data and Methodology

This study depend absolutely on secondary data for its analysis. The source of the time series data is the Central bank of Nigeria statistical bulletin 2012 volume 23. The generating process of the time series data was first examined. In other words, the time series properties of the variables in the model were determined through Augmented Dickey-Fuller (ADF) and Phillip Peron (PP) statistic tests. This was to ascertain the stationary level of the variables in the model. In order to ascertain the reliability and robustness of ADF and PP statistic tests, the Kwiatkowski-Phillips- Schmidt-Shin (1992) test statistics was utilize. The ADF model for the unit root test is expressed as:

$$\Delta X_t = \beta_0 + \beta_1 X_{t-1} + \sum_{i=1}^{p} \beta \Delta X_i + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

$$\Delta X_t = \beta_0 + \beta_1 X_{t-1} + \sum_{i=1}^{p} \beta \Delta X_i + \Omega_t + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

Given the unit root equation, the null hypothesis is that the coefficient statistically equal to zero that is $\beta = 0$. If there is no unit root, the series X_{t-1} will be stationary at the level or integrated of order zero expressed as I(0). The presence of unit root as a result of first differencing of the series will give stationary level, that is first order of integration denoted as I(1). Where X_t is a process of autoregressive AR(1), it represent the time series and its linear time trend. Change (Δ) is the first difference operator and β_0 is the constant, p is the optimum number of lags in dependent variable, e is the white noise. The method of analysis adopted in this study is analytical

The analytical tool that was employed include cointegration, Granger causality and error correction model (ECM) analysis. Bakare, Adesanya and Bolariwa (2014) used cointegration, Granger causality and error correction model (ECM) analysis. This study adopts the same analytical tool however, with variant variables. This study covers the period 1970 – 2012.

3.1 The cointegration test procedure

The Johansen cointegration test helps to determine the presence or otherwise of long run equilibrium relationship between the dependent and independent variables in the model. The estimation procedure assumes a vector autoregressive (VAR) base cointegration test (Johansen 1991) of order p which is given as

$Y_t = A1y_{t-1} + \ldots + Apy_{t-p} + Bx_t + e_t$ ……5

Where y_t is a - vector of x_t non-stationary I(1) variables, is a d -vector of deterministic variables, and e_t is a vector of innovations. This VAR model for cointegration is given as follow:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma\Delta\, y_{t-1} + Bx_t + e_t \ldots\ldots 6$$

Where

$$\Pi = + \sum_{i=1}^{p} Ai - I \quad \text{and} \quad \Gamma i = \sum_{j=i+1}^{p} Aj \ldots\ldots 7$$

3.2 The Granger causality test model

Inflation can be predicted better when the past values of fiscal deficit are used. In this study, where only the lagged value of the inflation variables in equation 8 is significant, it infer that fiscal deficit Granger causes inflation. If the lagged independent variables in the two equations are significant, then, it inferred a bi-directional or a feedback causality between fiscal deficit and inflation, but where only the lagged value of fiscal deficit variable in equation 9 is significant, it suggests that inflation Granger causes fiscal deficits. Olusoji and Oderinde (2011) and Wosowei (2013) empirical investigation found no causal relations between inflation and fiscal deficits, but Ozurumba (2012) opined that fiscal deficit cause inflation in Nigeria. This present study adopts causality test procedure to ascertain the position of the relationship between inflation and fiscal deficit in Nigeria. The causality model is given as:

$$INF_t = X_1 + \sum yiINF_{t-1} + \sum \beta FDGDP_{t-1} + \sum {}_{1t} \ldots\ldots 8$$

$$FD_t = X_2 + \sum \beta_1 FDGDP_{t-1} + \sum yiINF_{t-1} + \sum {}_{2t} \ldots\ldots 9$$

Where

X_1 and X_2 are constants, and Σ_{1t} and Σ_{2t} are the stochastic term. INF is measure of inflation and FDGDP is fiscal deficit.

The statement of hypothesis is

H_{01}: FDGDP does not Granger cause INF

H_{02}: INF does not Granger cause FDGDP

3.3 The vector error correction model.

A Vector Error Correction Model (VECM) is a restricted Vector Autoregressive (VAR) model designed for use with nonstationary series that are known to be cointegrated. The purpose of the VECM is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the coefficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long run state will be. Therefore, the VECM model for the short run dynamic model is expressed as:

$$\Delta INF_t = \beta_0 + \beta_1^1 \sum_{j=1}^{k} \Delta FDGDP_{t-1} + \beta_2^1 \sum_{j=1}^{k} \Delta ARGDP_{t-1} + \beta_3^1 \sum_{j=1}^{k} \Delta MSGDP_{t-1}$$

$$+ \beta_4^1 \sum_{j=1}^{k} \Delta GRGDP + \Pi_5 ECM_{.} + \varepsilon_{1t} \ldots\ldots 10$$

$\beta_1 - \beta_4$ are parameters to be estimate, Δ is the difference operator, k is the maximum distributed

lag length, β_0 is the constant, j is the lag length and ε_t is the error term.

3.4 The characteristics and expected signs of the variables in the model

The inflation rate (INF) is the dependent variable. Other variables are independent. The growth of fiscal deficit (FDGDP) in Nigeria is expected to influence inflation rate positively, this is because increase in public spending over ability to generate revenue may increase the price level of goods and services. Any increase in the growth rate of money supply (MSGDP) may increase inflation, hence, it is expected that MSGDP should have a positive sign. In Nigeria, the uncertainty that surround agricultural output due to sufficient/insufficient rain fall and vagaries of weather, finance and agricultural incentive simply suggests that when agriculture improves, the level of economic prosperity will increase which in turn reduce the effect of inflation in the economy. Thus, the expected sign of agriculture in relation to inflation should be negative. Poor output production of agricultural good reduce the level of economic prosperity, create and surge inflation rate. The growth rate of the agriculture (ARGDP) in the last ten years has been on the increase. Generally, the growth of gross domestic product (GRGDP) is an indication of increase performance of the economy. Improve economic activity suggest increase purchasing power ability for the consumer, which in turn diminish the size of inflation rate, thus, the growth rate of gross domestic product (GRGDP) is anticipated to sign negative to inflation.

4.0 Presentation of Results and Analysis.

4.1 Interpretation of the ADF and PP Test results.

Table 1 ADF and PP Test Results

	ADF Test @ 5 Per cent			PP Test @ 5 Per cent		
Variable	ADF Test value	Critical value	Remark	PP Test value	Critical value	Remark
INF	-6.374357	-2.936942	I(1)	-10.91920	-2.935001	I(1)
FDGDP	-6.328507	-2.936942	I(1)	-21.37297	-2.935001	I(1)
ARGDP	-4.989131	-2.936942	I(1)	-9.201917	-2.935001	I(1)
MSGDP	-4.365813	-2.936942	I(1)	-6.639495	-2.935001	I(1)
GRGDP	-10.91985	-2.936942	I(1)	-39.72623	-2.935001	I(1)

Computed from econometric views 7 software by the author.

First, it is important to estimate the unit root test before any other tests. This is to ascertain the stationary level of the data. Non-stationary data may complicate policy decision making. The estimated results of ADF and PP in table 1 above indicates that all the variables are stationary after first difference. Both ADF and PP critical values reveal that the variables are significant at 5 per cent level. The variables - growth rate of fiscal deficit, growth rate of agriculture, growth rate of gross domestic product, inflation and growth rate of money supply are stationary at first difference. This suggests that all the variables are stationary. However, it is important to check the robustness of the ADF and PP tests above. This was determined by the application of Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) statistic test.

Table 2: Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) statistic test Result.

Variables	KPSS Test Statistics	Asymptotic critical value @ 5 per cent	Order of integration	Null Hypothesis
INF	0.36	0.46	I(1)	Stationary
FDGDP	0.08	0.74	I(1)	Stationary
ARGDP	0.14	0.46	I(1)	Stationary
GRGDP	0.50	0.74	I(1)	Stationary
MSGDP	0.09	0.46	I(1)	Stationary

Computed from econometric views 7 software by the author.

4.2 Analysis of KPSS Statistic Test Result.

Table 2 above show the estimated results of KPSS statistic test. The result of KPSS reveals that the null hypothesis is stationary. The results of the KPSS Stationary test, as shown in Table 2, suggests that the null hypothesis is stationary for the variables at first difference, thus the null hypothesis cannot be rejected. Therefore, the KPSS test results further confirm that the ADF and PP unit root statistic test results in this study are stationary at first difference and integrated of order one I(1).

4.3 Analysis Cointegration Result.

Since the variables are integrated of the same order in ADF and PP and confirmed by KPSS, this study proceeds to examine their co-integrating relationship using the Johansen co-integration procedure. The Johansen co-integration test depends on two statistics test, i.e. the trace test in table 3 and the Max-Eigenvalue test in table 4. The trend assumption for estimating the cointegration equation was a linear deterministic trend and the lags interval of 1 to 1 was used. The result of the trace statistic test in table 3 below reveals 4 cointegrating equations or vectors in the series at 5 per cent level. This is an indication of the presence of long run equilibrium relationship between inflation and fiscal deficit, money supply, agriculture and gross domestic product. Based on this, the null hypothesis of the trace statistics was rejected at 5 per cent level. Also, the result of Max-Eigenvalue in table 4 reveals 1 cointegrating equation which is a confirmation of the presence of a long run significant relationship between the variables in the model. This outcome is in consonance with the findings of Ezeabasili, Mojekwu and Herbert (2012).

Table 3 Johansen cointegration result (Trace statistic)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability**
None*	0.635666	99.87230	69.81889	0.0000
At most 1*	0.472828	58.47526	47.85613	0.0037
At most 2*	0.323793	32.22592	29.79707	0.0258
At most 3*	0.297061	16.18442	15.49471	0.0393
At most 4	0.041376	1.732501	3.841466	0.1881

Computed from econometric views 7 software by the author.
Trace test indicates 4 cointegrating egn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Table 4 Johansen cointegration result (Max-Eigen statistic)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen statistic	0.05 Critical Value	Probability**
None*	0.635666	41.39705	33.87687	0.0053
At most 1	0.472828	26.24933	27.58434	0.0733
At most 2	0.323793	16.04150	21.13162	0.2224
At most 3*	0.297061	14.45192	14.26460	0.0467
At most 4	0.041376	1.732501	3.841466	0.1881

Computed from econometric views 7 software by the author.
Max-eigenvalue test indicates 1 cointegrating egn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

4.4 The Interpretation of Error correction Estimated result

Table 5: Result of Error correction model

Variables	Coefficient	statistic	ECM
INF(-1)	1.000000		-0.17 (-1.80)
FDGDP(-1)	3.459150	2.34*	
MSGDP(-1)	-0.800687	-1.02	
ARGDP(-1)	28.20471	0.36	
GRGDP	9.113746	5.49*	DW = 1.89
C	16.54748	R^{-2} = 0.64	F-statistic 08.66

Computed from econometric views 7 software by the author.

Owing to the presence of cointegration in this study, it becomes valid to use the error correction model to determine the dynamic relationship. The result in table 5 above reveals that the coefficients of the variables of FDGDP, ARGDP and GRGDP are sign positive, but only FDGDP and GRGDP are statistically significant at 5 per cent. The positive sign for FDGDP was anticipated for the study. The growth rate of money supply (MSGDP) was sign negative. This was not anticipated for this study. Certainly, this outcome does not honour the monetarist theory of inflation. The variables of MSGDP and ARGDP however, were not statistically significant at 5 per cent. The adjusted coefficient of determination R^2 (0.64) reveals that about 64 per cent of the variation in inflation is explained by the independent variables. Also, the Durbin-Watson (DW) result (1.89) is an indication of no serial correlation as the value can be approximated to 2.0. Basically, the coefficients of the estimated VECM result shows that one per cent increase in the growth rate of fiscal deficit (FDGDP) lagged in year 1 will increase inflation by 3.50 per cent. Similarly, a one per cent increase in growth rate of agriculture (ARGDP) and growth rate of gross domestic product (GRGDP) lagged in year 1 increase inflation by 28.20 per cent and 9.11 per cent respectively. On the contrary, one per cent increase in the growth rate of money supply (MSGDP) lagged in 1 year will reduce inflation by 0.80 per cent in Nigeria within the period under review. Obviously, this outcome was not anticipated because money supply has remained a positive determinant of inflation in Nigeria. The F-Statistic of 8.66 indicates that the totality of the model fit is significant at 5 per cent. The coefficient of VECM -0.17 is signed negative as anticipated. The VECM value measures the speed of adjustment back to equilibrium whenever the system is in disequilibrium. In this regard the result indicates that the speed of adjustment is 17 per cent. That is to say 17 per cent of the previous year drift from long run equilibrium was corrected. This is an indication of a relatively very slow feedback effect from the short run dynamic model to the long run relationship model. The VECM result is negative as expected for this study, however, it was statistically insignificant at 5 per cent. Generally, the outcome suggests a slow speed of adjustment of the inflation from the influence of fiscal deficit. The finding of this study is in harmony with the outcome of Ezeabasili, Mojekwu and Herbert (2012).

Table 6: Granger causality tests.

Pairwise Granger Causality Tests Date 08/24/14 Time: 17:36 Lags:1				
Null Hypothesis:	Observation	F- Statistic	Probability	Remark
FDGDP does not Granger cause INF	42	2.99221	0.09157	R
INF does not Granger cause FDGDP		0.02145	0.88431	A

Computed from econometric views 7 software by the author.

4.5 Explanation of the Estimated Granger causality Results

The result in table 6 above reveals that this study cannot reject the hypothesis that the growth rate of fiscal deficits does not Granger cause inflation, but reject the hypothesis that inflation does not Granger cause growth rate of fiscal deficits. This result suggests that fiscal deficit cause inflation. In other words, fiscal deficit establishes a unidirectional causal relationship with inflation without any feedback mechanism in Nigeria given the period under review. This study, on one hand, does not support the position of Olusoji and Oderinde (2011) and Wosewei (2013) whose empirical claims suggests that fiscal deficit does not cause inflation in Nigeria, on the other hand, the outcome of this study which suggests that fiscal deficit cause inflation gives credence to the work of Ozurumba (2012).

Table 7: Correlation Result

VARIABLES	INF	FDGDP	ARGDP	MSGDP	GRGDP
INF	1.000000	0.137844	-0.066278	-0.103483	0.349198
FDGDP	0.137844	1.000000	-0.240940	-0.421181	-0.123754
ARGDP	-0.066278	-0.240094	1.000000	0.051937	0.014807
GRGDP	0.349198	0.123754	0.014807	1.000000	-0.077144
MSGDP	-0.103483	-0.421181	0.051937	-0.077144	1.000000

Computed from econometric views 7 software by the author.

The correlation result above in table 7 indicates that fiscal deficit is signed positive. This suggests that fiscal deficit is positively correlated with inflation, thus, indicating that fiscal deficits have the capacity to influence inflation in Nigeria within the period under review. This result further enhances the Pairwise Granger causality result in table 6 above.

4.6 Analysis of the Residual and Stability Test Results.

Table: 8 Residual and Stability Test

Diagnostic Test Result		
	Statistic	**Probability**
Jarque - Bera Normality Test	3.359753	0.00000
Breusch-Godfrey LM Test	4.677540	0.015638
ARCH LM Test	4.963811	0.031572
Heteroskedasticity Test	0.414458	0.904214
Ramsey RESET	0.310682	0.734893
R^{-2}	0.64	Durbin Watson 1.89
CUSUM	Stable	
CUSUMQ	Stable	

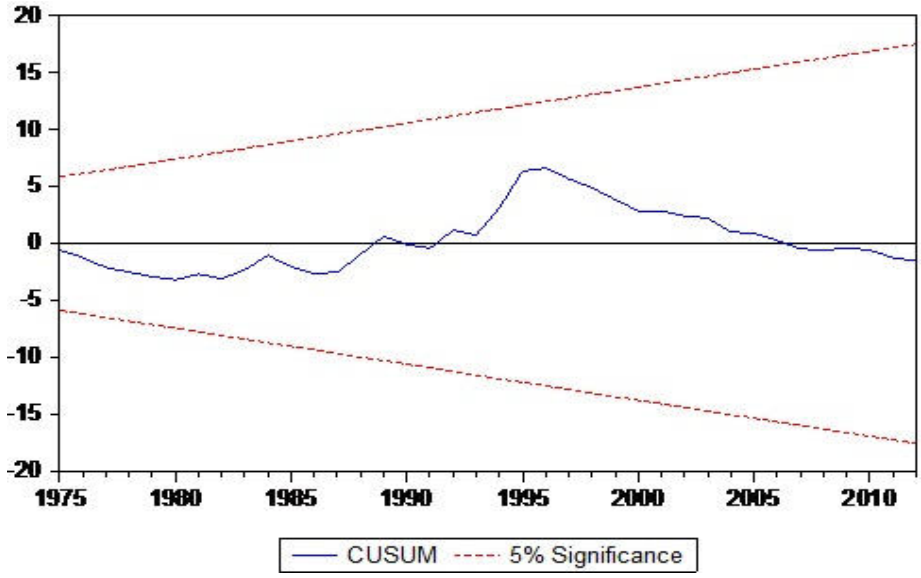
Computed from econometric views 7 software by the author.

This study conducted a diagnostic test for the error correction model as depicted in table 8 above. The estimated result of the diagnostic test for the coefficient of the Jarque – Bera (JB) statistics suggests that the test for the residual normality assumptions was adequate and as such not violated. Put differently, the JB statistics indicates that this study cannot reject the hypothesis that the true error terms in the fiscal deficit and inflation regression are normally distributed. This in essence

indicates that the functional normality of the error correction model is appropriate for the study. It also concludes that the error process of the model is normal. The coefficient of the Breusch-Godfrey LM estimated statistics conform to the absence of serial correlation. Similarly, the white heteroskedasticity and ARCH LM statistic values demonstrate the presence of homoskedaticity or absence of serial correlation. The lag length of 2 was adopted for the Breusch-Godfrey LM test. The Ramsey RESET test model specification revealed that the model functional form was adequately specified and robust for policy analysis.

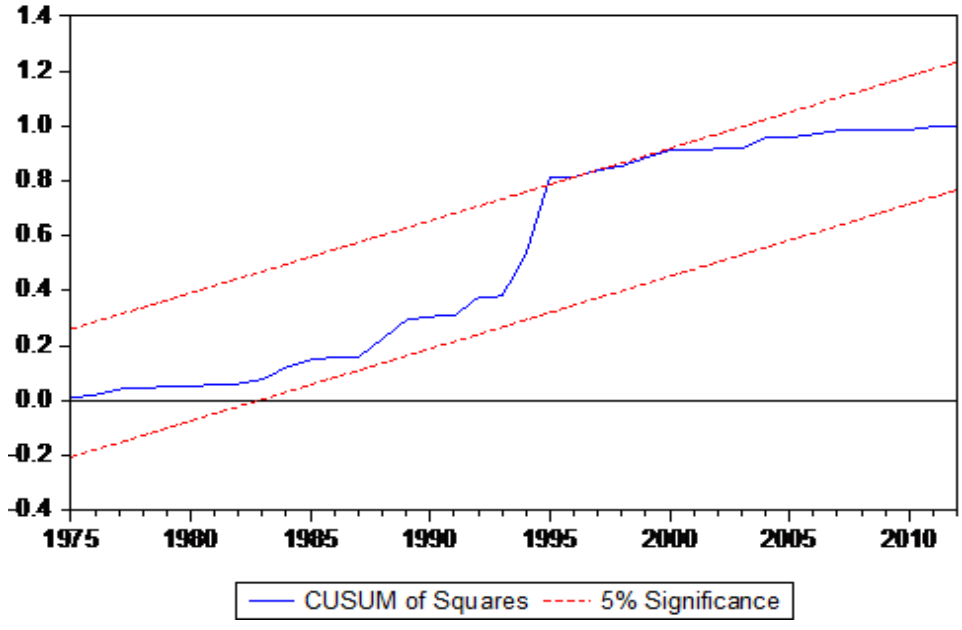
The recursive residual test, also known as cumulative sum (CUSUM) and cumulative sum square (CUSUMQ) was conducted in order to determine the stability of the error correction model. The plots of the CUSUM and CUSUMQ statistics in figure 1 and 2 below are within the critical bounds. Whenever the CUSUM and CUSUMQ qualify within the range of the critical bounds at 5 per cent significant level, it suggests that the null hypothesis which states that all coefficients in the error correction model are stable cannot be rejected. Since the plots of the CUSUM and CUSUMQ did not diverge from the critical region, it implies stability of the coefficients in the error correction model

Figure 1 cumulative sum (CUSUM)



Computed from econometric views 7 software by the author.

Figure 2 cumulative sum of square (CUSUMQ)



Computed from econometric views 7 software by the author.

5.0 Conclusion

This study investigated the relationship between fiscal deficit and inflation in Nigeria. The study used Augmented Dickey – Fuller, Phillip Peron unit root test and Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) statistic test to investigate the stationary level of the series. After first differencing all the variables were found to be stationary. The KPSS statistic test confirms the reliability and robustness of the ADF and PP test at first difference. The estimated cointegration result indicates the presence of a long run equilibrium between INF and the independent variables - FDGDP, ARGDP, MSGDP and GRGDP. The Pairwise Granger causality test result reveals a unidirectional causal relationship that run from fiscal deficits to inflation. This was confirmed by the positive correlation result. The outcome of the error correction model suggests that FDGDP, ARGDP and GRGDP impact positively on inflation, while MSGDP was sign negative. The variables of MSGDP and ARGDP however, were not statistically significant at 5 per cent. The error correction model result further suggests that the speed of adjustment or feedback effect from short run dynamic process to long run equilibrium process was very slow and insignificant. The diagnostic test result shows that the normality assumption and the functional form of the model were adequately specified. The CUSUM and CUSUMQ tests on the other hand indicted a stable regression line. The results of this study have implications for the relationship between fiscal deficits and inflation in Nigeria. In the first place, high fiscal deficits create fear because of the external borrowing level. A high level of external borrowing induces inflation. A fiscal management process that does not encourage increase revenue and reduce fiscal deficits in Nigeria will further worsen the level of inflation in the country.

References

Abel, A.A. and Awe, O.S. (2012). The Nexus between Budget Deficit and Inflation in Nigerian Economy 1980 – 2009. *Research Journal of Finance and Accounting*. Vo. 3. No.10.

Akcay, O. C., Alper, C. E. and Ozmucur, S. (1996). *Budget Deficit, Money Supply and Inflation: Evidence from Low and High Frequency Data for Turkey*. Bogazici University, Department of Economics, pp. 1-12.

Bakare, I.A.O., Adesanya, O.A and Bolarinwa, S.A. (2014). Empirical investigation between budget deficit, inflation and money supply in Nigeria. *European Journal of Business and Social Sciences*, Vol. 2, No.12 , pp 120-134.

Baro, R. J. (1989). The Ricardian Approach to Budget Deficits. *Journal of Economic Perspectives, 3*(2), 137-154.

Chimobi, O. P. and Igwe, O. L. (2010). Budget Deficit, Money Supply and Inflation in Nigeria. *European Journal of Economics, Finance & Administrative Sciences*, Issue 19, p52

Catão, L. and Torres, M. (2001). Fiscal Deficits and Inflation: A New Look at the Emerging Market Evidence. *International Monetary Fund Working Paper* No. 01/74.

Catão L.A.V., Terrones M.E. (2005) "Fiscal Deficits and Inflation". *Journal of Monetary Economics* , 52, pp. 529 - 554.

Dockery, E., Ezeabsili, V.N. and Herbert, W.E. (2012). On the Relationship between Fiscal Deficits and Inflation: Econometric Evidence for Nigeria. *Economic and Finance Review* vol. 2(7) pp. 17 – 30,http://www.businessjournalz.org/efr17

Darrat, A. F. (2000), "Are Budget Deficits Inflationary? A Reconsideration of the Evidence", *Applied Economics*, Vol. 7, No. 10, pp. 633-36.

Ezeabasili, V.N. and Mojekwu, J.N. and Herbert. W.E. (2012) An Empirical Analysis of Fiscal Deficit and Inflation in Nigeria. *International Business and Management*. Vol.4. No.1 p 105 – 120.

Fischer, S., Sahay, R., and Vegh, C. (2002). Modern Hyper- and High Inflations. *Journal of Economic Literature*, *40*, 837-880.

Islam, R. and Wetzel D. (1991). The Macroeconomics of Public Sector Deficits: The Case of Ghana. *Working Papers No.672*. Washington D.C: The World Bank, Policy Research Department.

Njeru and Randa (1998). Macroeconomic Implication of Fiscal Deficits: The Case of Kenya. Cited in Tchokote (2004), *Macroeconomics Effects of Fiscal Deficits in Cameroun* (Doctoral Dissertation). University of Ibadan.

Odionye, J.C. and Ebi, U.K. (2013). The Relationship between Budget Deficit and Interest Rate: Evidence from Nigeria. *European Journal of Business and Social Sciences*, Vol. 2, No. 1, pp 158-167

Olusoji, M.O. and Oderinde, L.O.(2011). Fiscal Deficit and Inflationary Trend in Nigeria: A Causal Analysis. *Journal of Economic Theory*. 5(2): 37 – 43.

Onwioduokit, E.A. (1996). Fiscal Deficits and Inflation Dynamics in Nigeria: An Empirical Investigation of Causal Relationships. *Economic and Financial Review*, vol. 37 no2 1-16. Central Bank of Nigeria.

Ozurumba, B.A. (2012). Fiscal deficit and inflation in Nigeria: The causal approach. *International Journal of Science and Technology Research.* Vol. No.5, p6-12.

Sill, K. (2005). Do Budget Deficit Cause Inflation. *BusinessReview*. Federal Reserve Bank of Philadelphia Q3, pp.26-33.

Wosowei, E. (2013). Fiscal Deficits and Macroeconomic Aggregates in Nigeria. Kuwait chapter of *Arabian journal of business and management review* vol. 2, no.9; p72 – 82

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar