

An Assessment of the Impact of Fiscal Policy on Inflation Rate in Nigeria

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Abstract

The study assess the impact of fiscal policy on inflation rate in Nigeria from 1986 to 2015. Secondary data was utilized for empirical analysis. Before the model estimations was carried out using the ordinary least square(OLS) method, the Augmented Dickey-Fuller(ADF) unit root was conducted amongst other empirical results for the study. Findings from the unit root test revealed that only Government capital expenditure (GCE) was stationary at level, while the other variables: inflation rate, Government recurrent expenditure, aggregate taxation are stationary after first differencing, more so, the results of co-integration revealed that that the series were co-integrated i.e. they have long run relationship. Further findings from the regression analysis revealed that Government recurrent and capital expenditures have positive relationship with the rate of inflation and that fiscal policies (Government expenditure and Taxation) are have significant impact on inflation rate in Nigeria. Thus, in view of these findings in order for Government to achieve price stability which is a macroeconomics goal: Government should improve her infrastructural development and maintenance provide high quality fiscal regulatory Authorities, utilities coordinated taxation to boost her productive base and taken cognizance of the various challenge like; imprudent spending weak sectorial leakage in our economy and other maladies constituting the bane of attaining price stabilizing.

Keywords: *Fiscal policy, Inflation, Government, Taxation*

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Background to the Study

One of the fundamental objectives of macroeconomic policy in both the developed and developing economies is the attainment and maintenance of price stability (low inflation) that supports economic growth. Economists of the classical and the neoclassical traditions seem to be in consensus with these objectives given the recognition that a high inflation rate could disrupt the smooth functioning of an economy (Ogunmuyiwa, 2008). At the individual level, inflation has adverse effects on fixed income earners and debtors but favours the creditors. For firms, the effect of inflation is called the 'menu cost' because it affects output when firms have to incur costs as they adjust to the new price level e.g., changing their price lists for customer (Guerrero, 2004).

The role of fiscal policy in stabilizing general price level (inflation rate) has long been recognized. Fiscal policy entails the use of government expenditure and tax to influence macroeconomic stability such as low inflation rate (i.e., single digit inflation rate). Many macroeconomists agree that expansionary fiscal policy stimulates aggregate demand and lowers inflation rate (especially if the cause of inflation is cost-push factors) (Ezeabasili, Mojekwu and Herbert, 2012). Fiscal expansion in this case could take the form of cuts in net taxes or increases in government spending. However, if the economy is inflationary due to demand-pull factors, to dampen the inflationary pressure, the fiscal policy prescription is to contract the economy indirectly by raising taxes to discourage consumption (Imobighe, 2012). Fiscal policy was not generally recognized as important macroeconomic policy until the birth of Keynesian economics in the mid-nineteen thirties which enhanced its significance as a policy tool to overcome the economic depression of Western Europe and North America. The threat of inflation in the immediate post-war years and the desire to maintain continuous full employment following world war 11 has also meant the continued use of fiscal policy in these same economies (Ndiyo and Udah, 2003).

In Nigeria, fiscal policy has been a major component of the macroeconomic policy measures of successive governments since independence era. On the whole, the ultimate goal of fiscal policy is promote economic growth and development and to ensure macroeconomic stability such as price stability. In other words, in designing and implementing fiscal policies, successive Nigerian governments expected to achieve sustained macroeconomic stabilization such as low level of inflation among others macroeconomic goals (Ezeabasili, Mojekwu and Herbert, 2012). Inflation in Nigeria has remains very high in spite of the favourable economic potentials for employment generation and output expansion in the country. Apart from the serious adverse effect of corruption on the economy, faulty and unfavourable fiscal policies of the government in the past three decades that have acted as disincentives to investment and productivity.

According to Omitogun and Ayinla (2007), the management of the Nigerian economy in order to achieve macroeconomic stability has been unproductive and negative hence one cannot say the Nigerian economy is performing. This is evidence in the adverse inflationary trend and poor government fiscal policies outcomes which are all symptoms of growing macroeconomic instability. Therefore, this study is set out to examine the impact of fiscal policy on inflation dynamics in Nigeria.

Literature Review

Conceptual Review

Central Bank of Nigeria (2011) defines fiscal policy as the use of government expenditure and revenue collection through tax and amount of government spending to influence the economy. Ogbola, Sonny and Isaac (2011) opines that fiscal policy deals with government deliberate actions in spending money and levying taxes with a view to influencing macro-economic variables in a desired direction. This includes sustainable economic growth, high employment creation and low inflation. Thus, fiscal policy aims at stabilizing the economy. Increases in government spending or a reduction in taxes tend to pull the economy out of a recession; while reduced spending or increased taxes slow down a boom.

According to Fatukasi (2012) inflation is the persistent increase in the general price level within the economy which affects the value of the domestic currency. It is not once and for all upward price movement but has to be sustained over time and affect all goods and services within the economy. The concept of inflation has been defined as a persistent rise in the general price level of a broad spectrum of goods and services in a country over a long period of time. Inflation has been intrinsically linked to money, as captured by the often heard maxim; "inflation is too much money chasing too few goods (Aminu and Anono,2012)

Empirical Review

Chukwuigwe and Abili (2008) investigated the impact of monetary and fiscal policies on nonoil export in Nigeria between 1974 and 2003. Using the ordinary least squares, their study revealed that interest rate and exchange rate, being proxies for monetary policies negatively affect non-oil exports. Budget deficit (proxy for fiscal policy) also has a negative effect on non-oil export.

Appah (2010) evaluated the effects of fiscal policy on the economic growth of Nigeria. A multiple regression model was applied covering the period 1991 to 2005. The result shows government tax revenues, government debts, government recurrent and capital budgets have not individual contributed to the economic growth of Nigeria and that a high and significant relationship exist between all the variables taken together.

Peter and Simeon (2011) tested the impact of fiscal policy variables on Nigeria's economic growth using VAR and ECM techniques from 1970 and 2009. The fiscal policy variables considered were federal government expenditure and federal government revenue while inflation rate and capital inflow were included in the model. The result showed that there exist a long-run equilibrium relationship between economic growth and fiscal policy variables in Nigeria.

Audu (2012) evaluated the harsh and unfavourable environments under which the nation's manufacturing sector operates using a theoretical exposition. The study identified the major problems of the sector as high production costs, poor infrastructure, finance and competition from fake and substandard imported goods, limited scope of

operation among others. The study also highlighted the cumulative effects of the harsh economic environment on the sector to include among others losing business opportunities, closing shops and incurring losses, operating below installed capacity, at 47% in 2009 and 45% in 2010. The study concluded that for Nigeria to be a developed economy, the manufacturing sector must be strong and dynamic.

Eze and Ogiji (2013) examined the impact of fiscal policy on the manufacturing sector output in Nigeria. Their study employed the ECM methodology for the period of 1990-2010. Using Government expenditure and Government tax revenue, the study showed that Government tax revenue has a significant negative impact on the manufacturing sector output while Government expenditure has significant positive impact on manufacturing. The results infer that if government did not increase public expenditure and its implementation, Nigerian manufacturing output will not generate a corresponding increase in the growth of the Nigerian economy.

Theoretical Framework

The Keynesian opposed the monetarists' view of direct and proportional relationship between the quantity of money and prices. According to this school, the relationship between changes in the quantity of money and prices is non-proportional and indirect, through the rate of interest. The strength of the Keynesian theory is its integration of monetary theory on the one hand and the theory of output and employment through the rate of interest on the other hand. Thus, when the quantity of money increase, the rate of interest falls, leading to an increase in the volume of investment and aggregate demand, thereby raising output and employment (Agba, 2005).

In other words, the Keynesians see a link between the real and the monetary sectors of the economy an economic phenomenon that describes equilibrium in the goods and money market (IS-LM). Equally important about the Keynesian theory is that they examined the relationship between the quantity of money and prices both under unemployment and full employment situations. According, so long as there is unemployment, output and employment will change in the same proportion as the quantity of money, but there will be no change in prices. At full employment, however, changes in the quantity of money will induce a proportional change in price. Thus this approach has the virtue of emphasizing that the objectives of full employment and price stability may be inherently irreconcilable (Omolola and Olagunju, 2004).

The Keynesian theory was later modified by the neo-Keynesian by incorporating some of the views of the classical economists into the Keynesian hypothesis. The neo-Keynesian theoretical exposition combines both aggregate demand and aggregate supply. It assumes a Keynesian view on the short-run and a classical view in the long-run. The simplistic approach is to consider changes in public expenditure or Bakare, (2011) the nominal money supply and assume that expected inflation is zero. As a result, aggregate demand increases with real money balances and, therefore, decreases with the price level. The neo-Keynesian theory focuses on productivity, because, declining productivity signals diminishing returns to scale and, consequently, induces inflationary pressures, resulting mainly from over-heating of the economy and widening output gap.

Methodology

Sources of Data and Method of Analysis

The study utilized annual time series data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS) Publication, and Federal Inland Revenue Service (FIRS) database. The ordinary least squares (OLS) estimation technique will be used to estimate the parameters of the specified multiple linear regression model, owing to its desirable BLUE properties. The analytical software for model estimation shall be econometric views (E-Views) 7 version. The estimated model is evaluated using diagnostic and summary statistics such as coefficient of multiple determinations, adjusted R^2 , and Durbin-Watson (d) statistic. These set of statistics help us to ascertain the reliability and healthiness of the estimated model.

Model Specification

To examine the impact of fiscal policy on inflation rate in Nigeria, this study adopted the linear-log model of Englama, Duke, Ogundiepe and Ismail (2010) with little modification given as follows:

$$INF = \beta_0 + \beta_1 \text{LogGRE} + \beta_2 \text{LogGCE} + \beta_3 \text{LogTAX} + \epsilon$$

Where:

INF = Inflation Rate

GRE = Government Recurrent Expenditure

GCE = Government Capital Expenditure

TAX = Aggregate Tax

Log = Natural Logarithm

ϵ = Error Term

t = Time

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ = Parameters of the model to be estimated

A Priori Expectation

This defines the theoretical expectations about the sign or size of the parameters of the specified model. The a priori expectations are determined by the principles of economic theory guiding the economic relationship of variables under study. For the specified model of study, in line with economic theory, the a priori expectations are mathematically expressed as follows: $\beta_0 < 0$ or $\beta_0 > 0$, $\beta_1, \beta_2 > 0$, $\beta_3 < 0$ or $\beta_3 > 0$.

Presentation and Discussion of Results

Data Presentation

To analyze the impact of fiscal policy on inflation rate in Nigeria, model estimation was carried out using annual time series data covering the period 1986 to 2015.

Descriptive Analysis of Variables

Table 1: Descriptive Analysis of Variables

Statistics	INF	LOGGRE	LOGGCE	LOGTAX
Mean	13.91333	5113622	156682.8	3837300
Median	9.910000	1744696	31616.75	1171601
Maximum	57.20000	19550321	601689.2	16995540
Minimum	4.980000	556690.7	12400.30	53679.80
Std. Dev.	13.55918	5741486	198278.4	5110343
Skewness	2.623781	1.086376	1.212400	1.559819
Kurtosis	8.331965	2.907243	2.930998	4.030089
Jarque-Bera	6.995846	5.911818	7.355516	1.349153
Probability	0.540001	0.092031	0.395280	0.651176
Sum	417.4000	1.53E+08	4700485	1.15E+08
Sum Sq. Dev.	5331.689	9.56E+14	1.14E+12	7.57E+14
Observations	30	30	30	30

Source: Computed using E-Views 9 software.

The summary of descriptive statistics of relevant variables of study is as reported in Table 1. As may be observed from the table, the mean, median, standard deviation as well as the skewness and kurtosis measures of our variables of interest are given. The mean values of INF, LOGGRE, LOGGCE and LOGTAX are 13.91333, 5113622, 156682.8 and 3837300 respectively while their respective standard deviations are 13.55918, 5741486, 198278.4 and 5110343. The Jarque-Bera test of normality shows that the error term in the specified model of study is normally distributed. This is evidenced by the respective insignificant Jarque-Bera statistics of the relevant variables based on the Jarque-Bera probability values of INF, LOGGRE, LOGGCE and LOGTAX which are respectively greater than 0.05 (i.e., 5%) level of significance.

Table 2: Summary of Augmented Dickey-Fuller Unit Root Test

Variables	Level	ADF Statistics	Remark
INF	1.502239	-3.008631	I(1)
LOGGRE	-1.354446	-8.477342	I(1)
LOGGCE	-3.905669	-3.905669	I(0)
LOGTAX	2.426440	-4.218764	I(1)
Note: * Indicates the rejection of the null hypothesis of existence of unit root at 5% significance level. Lags are selected based on Schwarz Information Criteria (SIC).			

Source: Computed using E-Views 9 software.

The ADF unit root test results in table 2 show that INF, LOGGRE and LOGTAX were non-stationary at level except LOGGCE. In other words, only LOGGCE was stationary at level. However, after first differencing, INF, LOGGRE and LOGTAX became stationary.

Granger Causality Test

Table 3: The Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Probability
GRE does not Granger Cause INF	28	0.27668	0.76078
INF does not Granger Cause GRE		0.11442	0.89238
GCE does not Granger Cause INF	28	0.16402	0.84971
INF does not Granger Cause GCE		0.33654	0.71769
TAX does not Granger Cause INF	28	0.11090	0.89551
INF does not Granger Cause TAX		0.35169	0.70722
GCE does not Granger Cause GRE	28	2.24574	0.12856
GRE does not Granger Cause GCE		5.75466	0.00941
TAX does not Granger Cause GRE	28	0.51582	0.60375
GRE does not Granger Cause TAX		2.54868	0.10005
TAX does not Granger Cause GCE	28	1.77134	0.19253
GCE does not Granger Cause TAX		30.9455	3.0E-07

Source: Computed using E-Views 9 Software

Table 3 above shows Pairwise Granger Causality tests. From the results, all the listed pair of variables have no causal relationships among them except GRE and GCE. That is, there is no causal relationship among the variables given the probability values of the variables at 5 percent level of significance. Therefore, the null hypotheses which stated that there are no causal relationships among variables are accepted.

Co-integration Test Results

Table 4: Co-integration Trace Statistic for all the Variables

Hypothesized No. of Cointegrated Equation(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	Probability Value**
None *	0.996879	484.7668	197.3709	0.0001
At most 1 *	0.993997	323.2219	159.5297	0.0000
At most 2 *	0.887688	179.9896	125.6154	0.0000
At most 3 *	0.799967	118.7683	95.75366	0.0005
At most 4 *	0.643064	73.70861	69.81889	0.0237
At most 5	0.496291	44.86305	47.85613	0.0930

Notes: Superscript * denotes rejection of the null hypothesis of no co-integration at the 5% level of significance, while ** indicates MacKinnon-Haug-Michelis (1999) p-values. Trace test indicates 5 co-integrating equation(s) at 5% level of significance.

Source: Computed using E-Views 9 Software.

Table 5: Co-integration Maximum Eigenvalue Statistic for all the Variables

Hypothesized No. of Cointegrated Equation(s)	Eigenvalue	Maximum Eigen Statistic	5 Percent Critical Value	Probability Value**
None *	0.996879	161.5448	58.43354	0.0000
At most 1 *	0.993997	143.2323	52.36261	0.0000
At most 2 *	0.887688	61.22132	46.23142	0.0007
At most 3 *	0.799967	45.05969	40.07757	0.0127
At most 4*	0.643064	28.84556	33.87687	0.1772
At most 5	0.496291	19.20121	27.58434	0.3991

*Notes: Superscript * denotes rejection of the null hypothesis of no co-integration at the 5% level of significance, while ** indicate s MacKinnon-Haug-Michelis (1999) p-values. Trace test indicates 5 co-integrating equation(s) at 5% level of significance.*

Source: Computed using E-Views 9 Software.

From tables 2 and 3, it is observed that both the trace and maximum Eigenvalue test statistics indicate 5 co-integrating equation(s) at the 5% level of significance. Based on this evidence, we can safely reject the null hypothesis of no co-integrating vectors and conveniently accept the alternative hypothesis of the presence of co-integrating vectors among all the variables in the specified error correction model. This implies that a long-run relationship exists between the variables that have entered the specified model of study.

Presentation of Regression of Results

Table 6: Ordinary Least Squares Regression of Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.320724	1.146687	3.768008	0.0012
LOGGRE	0.642647	0.135575	4.740171	0.0001
LOGGCE	0.104754	0.246081	0.425688	0.6749
LOGTAX	-0.751431	0.098280	-7.645818	0.0000
R-squared	0.972029			
Adjusted R-squared	0.946333			
Durbin-Watson stat	1.894112			
F-statistic	168.9038			
Prob(F-statistic)	0.000000			

Source: Computed using E-Views 7 Software.

Discussion of Results

From the estimated regression model, we observed that the a priori expectations were totally satisfied. The coefficients of explanatory variables (LogGRE and LogGCE) were observed to be positive; implying that a percentage changes in government recurrent expenditure and government capital expenditure on the average increased inflation rate by 0.643 unit and 0.105 unit respectively. On the other hand, the negative coefficient of Log TAX indicates that a percentage change in aggregate tax on the average reduced inflation rate by 0.751 unit.

The coefficient of determination (R^2) shows that about 97 percent of variation in inflation rate was explained by the changes in the explanatory variables of the estimated model. This implies that the estimated model has a good fit. The adjusted coefficient of determination (R^2) also shows that the estimated model has a good fit (R^2 adjusted=95%). The value of the Durbin-Watson (d) statistic (i.e., $d=1.89$) suggests the absence of positive autocorrelation. This implies that the forecasting power of the estimated model is more reliable in the absence of autocorrelation.

Furthermore, while government recurrent expenditure and aggregate tax impacted significantly on inflation rate, on the other hand, government capital expenditure impacted insignificantly on inflation rate during the period under consideration. This conclusion was based on the t-test statistic values corresponding to the explanatory variables and their respective probability values.

Lastly, from the estimated regression model, the high value of the F-statistic ($F=168.9038$) indicates that the parameters of the estimated model are jointly or simultaneously statistically significant. This implies that the estimated model is good for prediction, forecasting and policy analysis purposes.

Conclusion and Recommendations

The achievement of price stability, i.e., single digit inflation rate has been a fiscal policy priority of every economy, whether developed or developing. The realization of this goal undoubtedly is not automatic but requires policy guidance. This policy guidance represents the objective of fiscal policy. The basic fiscal policy instruments are public expenditure and tax among others. Over the years, the Nigerian economy has been plagued with several challenges. Some of these challenges include gross mismanagement/misappropriation of public funds, corruption and ineffective economic policies, lack of integration of macroeconomic plans and absence of harmonization and coordination of fiscal policies as well as inappropriate and ineffective policies. Imprudent public spending and the weak sectoral linkages and other socioeconomic maladies constitute the bane of attainment of price stability. Nigeria's greatest problem has remained the inability to efficiently use fiscal achieve general macroeconomic stability. Based on the findings of the study, the following recommendations were proffered:

- i. The relevant fiscal authorities should be more proactive in the discharge of their fiscal responsibilities to ensure strict adherence to the operating guidelines.
- ii. Government should hasten rehabilitation and upgrading of existing infrastructure, provision and development of new ones thereby providing the enabling environment of effective and efficient performance of the fiscal system in the country to consequently increase productivity (output) and subsequently reduce inflation rate to single digit.
- iii. All regulatory fiscal policy frameworks should be reviewed regularly to ensure sustained efficiency and effectiveness of the system in order to avoid lacuna in regulation and supervision.

- iv. Government should ensure more discipline in its fiscal operations and spending, and focus serious attention on how to use fiscal instruments to spur economic growth and reduce inflation rate to single digit.
- v. Government should use the revenue generated via taxation to boost the productive base of the economy by boosting the provision of productive infrastructure.

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Appendix I

Table 4.1: Regression Data

Year	INF	GRE	GCE	TAX
1986	12.1	556,690.7	12,400.3	460,880.6
1987	9.5	578,318.0	12,875.0	488,455.5
1988	9.0	600,432.5	13,759.1	502,265.8
1989	8.4	659,360.4	14,427.7	53,679.8
1990	7.5	682,402.8	15,500.7	546,210.4
1991	12.7	710,256.0	16,618.2	590,110.7
1992	44.8	760,291.0	19,408.1	631,486.5
1993	57.2	808,882.3	19,871.6	655,284.6
1994	57	877,382.7	20,093.8	701,506.3
1995	11.08	927,565.3	23,096.1	755,127.7
1996	12.09	1,286,215.9	23,327.5	562,626.6
1997	10.35	1,212,499.4	29,163.3	845,716.6
1998	12.43	717,786.5	34,070.2	837,418.7
1999	12.05	1,169,476.9	19,492.9	862,515.7
2000	5.61	1,920,900.4	24,822.9	985,022.4
2001	4.98	1,839,945.3	28,008.6	1,358,180.3
2002	6.34	1,649,445.8	94,731.8	1,512,695.3
2003	7.39	2,993,110.0	94,776.4	2,080,235.3
2004	8.69	4,489,472.2	113,309.4	1,987,045.3
2005	8.41	7,140,578.9	105,955.9	2,800,856.3
2006	10.33	7,191,085.6	133,595.0	3,108,519.3
2007	8.57	8,110,500.4	199,257.9	3,911,952.6
2008	7.73	9,913,651.1	247,839.0	5,189,802.6
2009	6.99	8,067,233.0	289,152.6	5,102,534.4
2010	9.04	10,157,328.2	397,816.5	7,614,440.5
2011	9.37	12,674,134.8	485,243.6	10,237,775.6
2012	13.04	13,988,455.7	490,341.0	13,435,890.1
2013	11.95	15,854,380.0	532,439.8	13,958,530.1
2014	10.32	16,320,551.6	587,400.5	16,346,706.3
2015	12.44	19,550,320.8	601,689.2	16,995,540.0

Sources: (i) Central Bank of Nigeria (CBN) Statistical Bulletin.
(ii) National Bureau of Statistics (NBS) Annual Publication.
(iii) Federal Inland Revenue Service (FIRS) Database.