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EFFECTS OF GOVERNMENT FISCAL DEFICITS ON MONEY SUPPLY IN NIGERIA, 1970 – 2014

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Abstract:

This study investigates the effects of government fiscal deficits on money supply in Nigeria. Because effect of money supply on inflation is almost always inseparable, effect on inflation has also been brought in. Data for the study are secondary data set for 1970 – 2014 obtained from CBN Statistical Bulletin. The method of analysis is Error Correction Model (ECM) and Pairwise Granger Causality. The regression results show that government fiscal deficits have significant and negative effect on money supply and that inflation does not contribute significantly to money supply and fiscal deficits. Pairwise Granger Causality is that money supply granger cause fiscal deficits. The study recommends that government should fiscal deficits so as to control the level of money supply and subsequently inflation.

Keywords:

Government Fiscal Deficits, Money Supply, Inflation, Error Correction Model, Granger Causality.

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INTRODUCTION

Every year, government prepares its budget for its fiscal year. In Nigeria for the past four decades fiscal year has been made to correspond with the conventional year of January to December. Before the change, fiscal year was April to March.

A budget can be in form balanced budget when planned expenditure equals planned revenue. It can be surplus when planned revenue exceeds planned expenditure. On the other hand it is deficit when planned expenditure exceeds planned revenue (Dalyop, 2010). Sometimes the case of surplus budget is called positive fiscal deficit while deficit budget is referred to as negative fiscal deficit (Cacy, 1975). It is this type that is commonly discussed.

In Nigeria huge oil revenue has been recorded for over four decades together with huge fiscal deficit financing. Since the Nigeria/Biafra Civil War ended in 1970, the country has operated persistent fiscal deficit. Ezeabasili, Ioraver and Herbert (2012) in a study report that since 1970 fiscal deficits have existed except for 1971, 1974, 1975, 1979, 1995 and 1996. The Table in Appendix confirms this. A cursory look shows that fiscal deficit was N455 billion in 1970, N4957.20 billion in 1980 rising o N22116.10 billion in 1990, N296105 billion in 2000, N1105439.80 billion in 2010 and dropping a bit to N97830.00 in 2014.

The revenue profile in the country shows huge revenue from oil supported by huge fiscal deficit financing as stated earlier. Taxation is another major source of revenue but revenue from this source is exacerbated by widespread tax evasion, tax avoidance and poor inefficient tax administration system. The existence of low per capita income has also adversely affected income tax generation. The reason is obvious as low income inevitably results in low tax liability. Moreover, as in other developing countries of Africa, there is a large number of self-employed people whose tax liability cannot easily be determined. Presently oil theft, pipeline vandalism and collapsing oil prices in the international oil market have all combined to worsen the revenue situation. Subsequently, they have tended to worsen fiscal deficit financing.

Before the Great Depression that ravaged the global economy in the early 1930s, classical economists' advocated balanced budget. They upheld Say's Law of the market that states that the economy is self-regulating. The government need no engage in fiscal deficit expenditure to influence the level of aggregate demand. The market supply can generate its own demand. Keynes argued that an economy in depression cannot be self- equilibrating. The government then should engage in spending including heavy deficits to raise the level of aggregate demand.

Since the time of Keynes, effects of government fiscal deficits on macroeconomic variables have generated divergent views among macroeconomists, policymakers and researchers. Such macroeconomic variables include money supply and its affiliate, inflation. We say affiliate because inflation cannot be separated from any discussion on money stock. Some economists say that inflation everywhere and every time is a monetary phenomenon.

The Central Bank of Nigeria (CBN), as monetary authority, exerts a lot of influence over money supply through its monetary policy actions. According Abata, Kehinde and Bolarinwa (2012) monetary policy is important for policy decisions on money in circulation, price stability, interest rate and credit system of the banking sector. On the other side, we have fiscal policy which deals with taxation, public expenditure and fiscal deficits financing.

Generally, the controversy as to the effects of fiscal deficits on macroeconomic variables including Money Supply has reminned unresolved. Ball and Mankiw (1995) state that deficits reduce national savings in form of private and pubic savings. They opine that when the government runs a budget deficit, negative public saving occurs. Furthermore, they state that fiscal deficits may increase trade deficit resulting in outflow of assets abroad by way of capital flight.

Other researchers such as Mohanty (2012) and Alesina (2012) opine that generally government fiscal deficits have adverse effects on macroeconomic factors (money supply and inflation inclusive). Mandilaras and Bird (2004) add that fiscal deficits bring about economic imbalances that often culminate in economic crisis. They also observe that when deficits are financed by local borrowing, there is tendency to increase cost of funds and thus crowd-out the private sector.

On the other hand some authorities have extolled the benefits of fiscal deficits. Chrystal and Thorton (1988), Mondud (1998) and Fay and Porter (2006), for example, state that government fiscal deficits provide funds for development of infrastructure and development of Money and Capital Markets. Resources for provision

of social services such as education and health are also sourced from fiscal deficits. When we consider government fiscal deficits and money supply, our a priori expectation is that increase in deficits will obviously increase money supply and subsequently increase inflation.

It is against these discordant views that this study is undertaken to examine effects of government fiscal deficits on money supply and subsequently inflation. Using time series econometrics of Error Correction Model (ECM) the study is able to investigate how government fiscal deficits affect money supply and inflation.

The outcome of the study will benefit government policymakers when they are preparing their annual budgets which for decades have been predominantly deficit budgets. The Central Bank of Nigeria (CBN) stands to gain in their formulation of monetary policy in a country, operating under fiscal policy dominance (Sargent and Wallace, 1981). IT will also benefit other researchers in this area by adding to the stock of existing literature.

In scope, the study covers 1970-2014 and it is limited to federal government fiscal deficits because data are readily available. Data for sub-national (states and local) government are either not available or incomplete.

The paper is arranged in five sections thus:

Section (a) is the introduction and covers points discussed so far; Section (b) reviews existing literature;

Section (c) discusses methodology and present data for the study as presented in Appendix;

Section (d) analyses and interprets the data while Section (e) concludes and makes recommendations.

Section (b) Review of Related Literature

Government raises its fiscal deficit revenue by borrowing from foreign and local sources, depletion of external reserves and printing of money. Fiscal deficits affect different macroeconomic variables. This study examines how they affect money supply and subsequently inflation. The work hinges on theoretical framework of Keynesian eclctic National Income Model for open economy. The model is stated as

Y = C + I + G + (X-M) where Y is the national output and is proxied by Gross Domestic Product (GDP). C stands for consumption expenditure of households, while I represent the Investment Expenditure of the business sector; G is the public sector expenditure of the government. X is exports while M is imports. In other words (X – M) represents the external sector. The fiscal deficits are embedded in G but effects spread out to the entire economy. Government expenditure which includes fiscal deficits is felt by way of grants, subsidies, tax cuts and increase. Tax cuts affect consumption of households by increasing disposable income. For business sector it increases their earnings. However, the effect of increasing or decreasing disposable income will largely depend on whether the beneficiaries of tax cuts are Ricardian or otherwise. If they are Ricardian, their reaction will leave consumption largely unchanged because according to the Ricarding Equivalence Hypothesis (REH) they will preserve present tax cuts waiting for anticipated tax increase. Increasing or decreasing capital allowances and subsidies affects I. The external sector (X-M) can be affected by export and import duties. We note, however, they these actions are amplified by the multiplier.

A number of theoretical and empirical studies have been done on effects of government fiscal deficits on money supply and inflation. We review some of them. Cacy (1975) in a survey of fiscal deficits and money supply in the US observes that money supply grows rapidly when deficits are large and slowly when deficits are low. According

to him, when deficits are financed by money creation or drawing from reserves, money supply rises. When deficits are done by local borrowing money supply is unaffected. He explains this by saying that increase in money supply due to government expenditure is offset by a decline in money balances of purchasers of instruments issued to borrow. He concludes that money supply in the US is closely linked to deficit spending of the government.

Sill (2005), in his own study also the US, states the common worries based on the general feeling that often government fiscal deficits lead to inflation. He states that government fiscal deficits are often related to the quantity of money in circulation through the government budget constraint. Budget constraint relates available resources to expenditure and applies to households, firms and sub-national governments. Sill (2005) observes a nexus between fiscal deficits and revenue from seigniorage as a source of inflation.

According to him, the level of government use of seigniorage to finance deficits plays an important role in determining the link between budget deficits, money supply and inflation. But there is link between monetary policy and fiscal policy. This is so because money supply, in form of seigniorage, provides revenue to fiscal policy aspect of government funding. However, whether this will result in increased inflation or not depends on the extent to which monetary policy and government policymakers design fiscal deficit during budget preparation. For the US, he observes little evidence of any link between fiscal deficits, money growth and inflation.

Lozano (2008) carried out a study on the relationship between fiscal deficits, money supply and inflation in Columbia. Using Vector Sector Correction Model (VECM), he examined the relationship between fiscal deficits money stock and inflation. The results of the study point to close long run relationships between the variables. With regards to fiscal deficits, the error correction estimates provide evidence that 1% increase in fiscal deficits leads to an increase of about 0.46% in money growth. According to him, the causal long term relationship between fiscal deficits, money supply and inflation can vary depending on the degree of independence of the nation's Central Bank and the type of monetary policy pursued. His study concludes in agreement with Sargent-Wallance Hypothesis (S-WH) that there is a causality link from fiscal deficit to money supply and subsequently from money supply to inflation in Colombia.

Chaudhary and Ahmad (1995) analyse the relationship between government fiscal deficit and money supply in development countries. They opine that there is no justifiable conclusion supporting a hypothesis that government fiscal deficits increase money supply in developing countries studies. Evidence of fiscal deficits causing inflation is not also seen.

A study by Mukhtar and Zakaria (2010) is on the long run relationship among inflation, money supply and budget deficits in Pakistan. The study also examines the direction of causality among the variables. Preliminary tests using Augmented Dickey- Fuller and Johnasen's cointegration techniques to establish unit root and cointegration were done. After that Vector Error Correction Model (VECM), was used to test the relationship between fiscal deficits, money supply and inflation in Pakistan. The study concludes that inflation in Pakistan for over six decades has been linked to money growth but there is not evidence of long run relationship between fiscal deficits and inflation.

Jeitziner's (1995) study is an empirical one to find a link between government fiscal deficits and money growth in Switzerland. Using quarterly figures for regression

analysis for the period of 1973-1994, the study has three possible reasons for the positive results discovered. Firstly, both series might simply reflect the business cycle and so may not be directly related in actual fact. In this case there is need to split the deficits into cyclical and structural components. Secondly, spurious correlation between deficits and money growth may arise because of a common upward trend between both series over the sample period. Thirdly, an apparent positive relationship between fiscal deficits and money supply may be as a result of seasonality of the serial data. However, at the end of the study he concludes that there is a significant and positive relationship between government fiscal deficits and money growth in Switzerland.

Odionye and Uma (2013) carried out a study on government fiscal deficits and money supply in Nigeria. The study reports that money supply accounts for about 48% of variations in fiscal deficits in Nigeria. They also add that money supply and inflation serve as the driving force behind fiscal deficits in Nigeria. Maji and Achegbulu (2012) in their study report that fiscal deficits and money supply are positively related in Nigeria.

Omoke and Oruta (2010) examined the relationship between government fiscal deficits, money supply and inflation in Nigeria. They report that there is no evidence of long run relationship between government fiscal deficits and money supply and inflation in Nigeria. A Pair-wise Granger Causality performed indicates that it is money supply that causes fiscal deficits. This is contrary to the popular view that fiscal deficits cause money growth.

Section (c): Methodology of the Study

Secondary data from CBN Statistical Bulletin (various issues) are used for regression analysis to test the Error Correction Model (ECM) model developed for the study. The data are found on Table I marked Appendix. The model for the study is adapted from the work of Chaudhary and Ahmad (1995). The model

for this study is stated as:

MS = f(GFD, INF) which put in econometric equation is MS = a0 + a1GFD + a2INF + e where

GFD = Government Fiscal Deficits INF = Inflation

e = Stochastic error term a0 = Intercept

a1 and a2 = coefficients of independent variables. A priori expectations are that a1 and a2 will increase with increase in money supply so that a1 and a2 > 0.

Granger causality test is also performed to determine if any variable causes the other.

Section (d): Presentation of Result and Data Analysis

Data are analyzed using Error Correction Model techniques. But before analysis preliminary statistical test are done. Unit root test is necessary to be done because it is necessary to establish stationarity of data used. Non stationary data may most likely produce spurious results (Ismail, 2008).

Table 2: Unit Root Tests

Variable	ADF	Order of Integration	Significance Level
MS	-6.356684	1(1)	1%
INF	-6.67446	1(1)	1%
GFD	-3.976015	1(1)	1%
ECM	-12.189080	1(1)	1%

From the above table, we observe that none of the variables is stationary at level but at first difference for 1% significance level.

Johnansen's cointegration tests are also done to determine that the variable have long run equilibrium relationship. The tests are also necessary to complement unit root test. Table 3 below show Johansen's cointegration results.

Table 3: Johansen's Cointegration Test Results (Trace)

Hypothesized No of C.E (s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob. **
None *	0.977122	180.5183	29.79707	0.0001
At most 1 *	0.286085	18.08229	15.49471	0.0199
At most 2 *	0.080134	3.591651	3.841466	0.0581

Trace test indicates two cointegration equations at 0.5 significance level.

* Denotes rejection of Null hypothesis at 0.05 level of significance.

** Donates Mckinnon-Haug-Michelis p-value. Another cointegration test buy maximum Eigen-value is shown on Table 4 below.

Table 4: Cointegration Rank Result (Max Eigen Value)

Hypothesized No of C.E (s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob. **
None *	0.977122	162.4360	21.13162	0.0001
At most 1 *	0.286085	14.49064	14.26460	0.0461
At most 2	0.080134	3.591651	3.841466	0.0581

Max-Eigen Value and trace test indicates one cointegrating equation at 5% significance level.

Since there is at least one cointegrating result, we conclude that there is cointegration among the variables. We proceed to present the regression results as on Table 5 below.

Table 5: Error Correction Model (ECM) Results

Variable	Coefficient	Std. Error	T-Statistics	Prob.
C	11.28127	0.254209	44.37790	0.0000
GFD(-1)	-5.370007	9.590008	-5.603096	0.0000
INF(-1)	0.005273	0.009943	0.530288	0.5988
ECM(-1)	-0.905707	0.05978	-5.534472	0.000

R^2 0.868866 F-statistics 88.34408

Adjusted R^2 0.859031 Durbin-Watson (D-W) stat 1.955143 prob. (F-Stat) 0.0000

Section (d) Interpretation of the Regression Results

R^2 and Adjusted R^2 at 0.868866 and 0.859031 respectively show that the explanatory variables are robust and effectively explain the dependent variables (MS). Thus the equation is good fit. The F-statistics measures the overall significance of the explanatory parameter. The f-statistics value of 88.34408 and probability of 0.000 indicate that all the variables are all statistically significant and positively related with coefficient C value of 11.28127. Further examination of the coefficient column, it is observed that government fiscal deficits (GFD) have expected negative sign so that a decrease in GFD will increase money supply (MS). Inflation (INF) has positive sign suggesting that an increase in inflation will increase money supply. T-statistics which measures the individual statistical significance show that government fiscal deficit is statistically significant at 10% while inflation is insignificant. These mean that government fiscal deficits significantly contribute to money growth while inflation does not contribute significantly to money supply in Nigeria.

The Durbin-Watson statistic of 1.9 (almost 2) reveals the absence of autocorrelation. The coefficient of the error correction model carries the expected sign and statistically significant at 10% with the speed of convergence to equilibrium 0.905978 (approximately 91%).

Pairwise Granger Causality Test

Granger causality test carried out is shown on Table 6 below.

Table 6: Pairwise Granger Causality Test

Null Hypothesis	Observation	F-statistic	Prob.
GFD does not Granger cause LMS	41	682.531	2.0030
LMS does not Granger cause GFD	41	5.06918	0.0028
INF does not Granger cause LMS	41	0.17203	0.9511
LSM does not Granger cause INF	41	0.33572	0.8518
INF does not Granger cause GFD	41	0.21866	0.9261
GFD does not Granger cause INF	41	0.34286	0.8470

From the pairwise causality test, we see that it is only money supply that granger cause government fiscal deficits and not vice versa. In other words it is unidirectional causality from money supply to government fiscal deficits.

Section (e): Conclusion and Recommendation

Conclusively, we restate that government fiscal deficits exert enormous effects on a nation's macroeconomic variables including money supply and inflation. Some researchers such as Chrystal and Thorton (1988) and Fay and Porter (2006) opine that fiscal deficits have benefits. On the other hand some other scholars such as Alesina, (2012) and Mohanty (2012) hold that fiscal deficit are harmful for any economy. This study has therefore gone to examine the effects government fiscal deficits have on money supply and inflation.

The study finds that government fiscal deficits have significant and negative effect on money supply so that a decrease in government fiscal deficits will lead to increase in money supply. This finding disagrees with that of Omoke and Oruta (2010) whose finding is that it is money supply that increases government fiscal deficits. Odionye and Uma (2012) agree with Omoke and Oruta (2010). The finding of this study is also in disagreement with Ahmad, (1995) whose finding in their study of some developing countries is the absence of link between fiscal deficits and money supply. However, the study agrees with Cacy (1975) whose study of the United States of America opines that money supply grows rapidly with growth in fiscal deficits.

Another finding of this study is that fiscal deficits have insignificant and negative effect on inflation. Inflation however, does not contribute to money supply. The study of Omoke and Oruta (2010) report that there is no evidence of fiscal deficits causing increases in money and inflation. A pairwise granger causality report a unidirectional causality from money supply to fiscal deficits. As for fiscal deficits and inflation, the insignificant negative relationship agrees with Sill (2005) who opines that fiscal deficits do not necessarily cause inflation except, however, if deficits are financed mainly by monetization.

This study recommends that government should reduce excessive fiscal deficits to ensure money supply is not growing with subsequent increase in inflation. This recommendation is supported by the work of Muhktar and Zakaria (2010) which sees the nexus between fiscal deficits and money supply as drivers of inflation in Pakistan.

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APPENDIX

Year	Govt. Fiscal Def.₦bn	Money Supply (M_2) ₦M	Inflation Rate %
1970	-455.10	786.56	13.76
1971	+171.60	971.93	16.00
1972	-58.80	1055.82	3.46
1973	+166.10	1265.99	5.40
1974	+179.40	1753.73	12.67
1975	+2390	3031.33	33.96
1976	-190.80	4510.55	24.30
1977	-781.40	6147.00	15.09
1978	-2821.90	7392.76	21.71
1979	-1461.70	9158.80	11.71
1980	-1975.20	11856.60	9.97
1981	-3902.10	14471.17	20.81
1982	-6104.10	15786.74	7.70
1983	-3364.50	17687.93	23.21
1984	-2660.40	20105.94	17.82
1985	-3039.70	22299.24	7.44
1986	-8245.3	27389.80	5.70
1987	-5889.7	33667.40	11.29
1988	-12160.9	45446.90	54.51
1989	-15134.7	47055.00	50.47
1990	-22116.10	68662.50	7.50
1991	-35755.2	87499.80	13.01
1992	-39532.5	129088.50	44.59
1993	-107735.3	198479.20	57.17
1994	-70270.6	266944.90	57.03
1995	-13389.9	318763.50	72.84
1996	-1000.0	370333.50	29.27
1997	-32049.5	429731.30	8.53
1998	-5000.0	526637.80	10.00
1999	-285104.7	699733.70	6.62
2000	-296105.7	700230.50	6.93
2001	-103777.3	1315869.10	18.87
2002	-201401.7	1599494.60	12.88
2003	202724.7	1985191.80	14.03
2004	-172406.3	2263587.90	15.00
2005	-161406.3	2814846.10	17.86
2006	-101397.5	4027901.70	8.27
2007	-11723.5	5809826.70	5.38
2008	-4738.5	9166835.30	11.58
2009	-810008.5	10767377.80	11.54
2010	-1105439.8	11034940.93	13.72
2011	-113000388.3	11300504.06	10.30
2012	-1238364.0	11300504.06	12.00
2013	-1,153,490	15,160,290	8.0
2014	978,430	17,680,520	8.0