Effect of Government Fiscal Deficits on Domestic Private Investment In Nigeria, 1970-2013

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Abstract: *The study investigates the effects of government fiscal deficits on domestic private investment in Nigeria for the period 1970-2013. Fiscal deficits have been persistent for the entire period except 1971, 1973-1975, 1979, 1995 and 1996. The technique of Augmented Dickey- Fuller (ADF) and Philips –Peron (P-P) were used to establish unit root. Johansen co integration technique was used to confirm that the variables have long run relationship. After these preliminary statistical tests, Ordinary Least Squares estimates reveal that government fiscal deficits have negative and insignificant effect on domestic private investment. It was also found that real lending interest rate has positive and significant effect on domestic private investment in Nigeria. It is recommended that government should continue to develop the infrastructure which benefits the private sector indirectly. This implies that government fiscal deficits complement the private sector by creating favourable and enabling environments.*

Keywords: *Government fiscal Deficits, Domestic private investment, crowding-out, Complementarity, circular flow of income, Ordinary Least Squares (OLS)*

I. Introduction

Background To The Study

Economic theory posits that government's annual budget can be balanced when projected revenue equals projected expenditure, surplus when projected revenue exceeds projected expenditure, and in deficit when projected revenue is less than projected revenue (Dalyop, 2010). Before the Great Depression of the early 1930s, it was generally believed that government should balance its budget or even aim at annual surplus to make up for any past period when there was a deficit. Fiscal deficits arise when revenue from taxation and non-taxation sources fall short of government expenditure. In Nigeria major sources of revenue is from oil and taxes. The nation's revenue suffers such constraints as low per capita income which adversely limits the income tax. There are also the problems of a widespread incidence of tax evasion, tax avoidance and poor tax system of collection and administration. Recently oil theft has reared its head in the oil sector thereby affecting oil revenue. Against this background government expenditure which has grown enormously exceeds revenue, yet government has to pay for public goods and services such as provision of infrastructure in the country, pay for some social services and run the Ministries, Departments and Agencies (MDAs). Since there is short fall in revenue as against expenditure, the resultant deficits have to be financed by deficit. That means that fiscal deficits have become very important sources of finance for the government.

According to Alesina and Tabellini (1987), fiscal deficits can serve the purpose of income redistribution and minimize the dead weight of taxation associated with the provision of public goods and service though government expenditure. Fiscal deficits, as sources of finance for the government assumed unprecedented importance since the Great Depression of the early 1930s when Keynes propounded the theory of Aggregate Demand. Keynes pointed out that there were ineffective demand and massive unemployment of resources. By engaging in massive deficit spending, the government will get people to have more disposable income to spend on goods and services and firms will have resources to expand. Keynes model stated that fiscal expansion, beefed up by the operation of the multiplier, will expand the level of aggregate demand. This will also increase employment of idle resources as producers get into more production to meet up with the increased aggregate demand. In other words, Keynes argued that balancing the budget in line with the Classical theory of the self-equilibrating Say's Law of the market may not always be necessary. Says law of the market argues that the economy is self-regulating and government need not engage in any fiscal deficit to increase demand. Says' law states that supply is capable of generating its own demand. Contrary to these arguments, Keynes stated that through deficit spending the government will increase demand and improve public investment that complements private investment. Since Keynes' revolution, fiscal deficits financing has assumed added importance.

Nigeria since independence has, like other developing countries, engaged in fiscal deficits financing to provide much needed finance for development of infrastructure, bureaucracies, special agencies, parastatals and corporations that were set up. They were maintained by annual subventions which aggravated government fiscal deficits.

However, government fiscal deficits remain matter of controversy among macroeconomists, policymakers and researchers. Studies by Chrystal and Thorton (1988), Mondud (1999), Fay and Porter (2006) posit that government fiscal deficits are used to develop infrastructure, and development of money and capital markets. They also provide social services in education and health that indirectly benefit the private sector firms. Conversely, other studies by Mohanty (2012), and Alesina (2012) opine that government fiscal deficits have adverse effects on the macroeconomy. They argue that in particular local borrowing to finance deficits, raise cost of capital (lending interest rate of banks) and thereby crowd-out the private (real) sector. It is against this situation that this study is carried out to investigate the effect of government fiscal deficits on domestic private investment in Nigeria. Using recent development in time series economics such as Ordinary Least Squares (OLS) this study is able to estimate the short run and long run effects of government fiscal deficits on domestic private investment.

The study has a lot of significance to policymakers of government especially when the budget office of the ministry of finance is preparing the perennial fiscal deficit budget. It will also benefit other researchers in this field by adding to the scanty existing literature.

The scope of the study is limited to 1970 to 2013. It is also limited to Federal Government fiscal deficits because the figures are readily available.

The work is presented in sections.
Section (I) is on the points discussed this far; Section (b) reviews the literature
Section (II) is the methodology of the study and data presentation on Appendix.
Section (III) is on the analysis and interpretation while
Section (IV) concludes with recommendation.

II. Review Of Related Literature

The theoretical framework of the study is the Keynesian eclectic National Income identity model of Y = C+1+G+X-M. Here Y is National Income, C represents private consumption of Households, I represents private investment of the business sector, G represents government expenditure in which fiscal deficits is embedded, X stands for exports and M stands for imports. Government fiscal deficits enter the economy through tax cuts/ increases, subsidies and transfer payments. Government tax cuts/increases affect private consumption (C) by increasing or decreasing disposable income. Tax holidays, capital allowances and subsidies also affect investment of firms. (I). In the external sector (X-M) effects are felt through import duties cuts/increases and export duties cuts/increases. In all these ways government deficits affect the entire economy through the process of circular flow of income.

However, the study on relationship between fiscal deficits and domestic private investment are replete in the literature. For instance the work of empirical works on the subject matter. Easterly and Schmidt-Hebbel (1993) that the effect of government fiscal deficits on domestic private investment depends on whether private and public investment complement or substitute for each other. If it is a substitute, higher government fiscal deficits may most likely crowd-out private investment. But if it complements, it will most likely crowd-in private investment. They further add that public deficit of government can be rewritten in terms of the economy's aggregate resources or saving-investment constraint. This is stated as: Public Deficit = public investment- public saving = private saving – private investment + foreign saving = public deficit which must lead to some combination of lower private consumption, lower investment and higher foreign saving. The specification of private investment considers the direct and indirect (through higher interest rates) effects of deficits as well as whether an increase in public investment causes private investment to fall. Their study reports that fiscal deficits affect private investment, public fiscal deficit and the user cost of capital. The higher the complementarities of the public and private investment, the more likely that public investment will have a net positive effect on private investment. If there is domestic financial repression of interest rates and the public sector is given preferential access to domestic credit, the public deficit could crowd out private investment. When interest rates are not regulated, fiscal deficit financing through internal borrowing tends to push up real interest rates and raise private investors' cost of capital. Such a situation will most likely crowd out the private sector.

Kustepeli (2005 examined the effect of government fiscal deficits on domestic private investment in Turkey. His study tests government total spending against fiscal deficit. The finding is that while total government spending crowds in private sector investment, fiscal deficit spending crowds out private investment.

The study by Altunc and Sentunk (2010) using Auto Regressive Distributed Lag (ARDL) techniques also on Turkey, report that the long run domestic private investment is stimulated by the total infrastructural and non-infrastructural public investment. This means that government fiscal deficit is complementary and crowds in private investment in the short-run and may crowd out in the long run.

Alani's (2006) study is on the effect of government fiscal deficit on private investment in Japan where deficit is financed by government issuing of bonds. The period of study is 1998-2006 and reports that government fiscal deficit financed by bonds does not crowd-out private investment in Japan. The main reason given is that interest rates are not sensitive to fiscal deficit so that private and public expenditures are complementary. The study adds that with very high level of financial development, finances are easily sourced from local and external markets.

Mitra (2007) investigates the effect of public sector deficit on private investment in India. Empirical results of the study show that government fiscal deficit in India has crowded in private sector investment. Looney's (1995) study examines public sector deficits and private investment in Pakistan for the period 1984-1993. Consistent with the crowding out hypothesis the overall impact of the actual deficit on private investment is negative.

- Reinforcing the crowding-out hypothesis, the results obtained using public borrowing in the domestic capital market also produce feedback effect showing the impact of government deficit on private investment is negative.
- As expected, unanticipated fiscal deficits and public borrowing in the domestic capital markets are more detrimental to private investment stimulating further fiscal deficits and public borrowing in the domestic capital markets.
- The causality test suggests that expanded public investment in infrastructure has not played an important role in stimulating private investment. It may even be considered that it is private investment that induces larger fiscal deficit and domestic borrowing. Looney (1995) concludes that financial crowding-out of private investment is a district possibility but may not be a straight forward process.

Biza, Capingura and Tsegaye (2013) examine the effect of government fiscal deficits on domestic private investment in South Africa for the period 1994-2009. Using Vector Auto Regression (VAR), the study observes that if the government uses fiscal deficit to develop infrastructure which benefits the private sector, crowding-out need not occur. The results of the study also indicate that fiscal deficit has negative long run effect on private investment. And that fiscal deficit, real interest rate and inflation negatively affect domestic private investment in the long run.

The works of Kiprop (2013) on the effect of government budget deficit on private investment using GMM and panel data on seventy developing countries found that fiscal deficit exacerbated by corruption has significant negative effect on domestic private investment in most developing countries

Again, Islam and Wetzel's (1991) study of fiscal deficits and private investment in Ghana observe that public sector deficits affect private sector through two main channels. First, high public deficit financed by domestic sources can crowd-out the private sector because it will raise real interest rate for the private sector. Second, direct credit control that allocates more money to the government will leave less funds for the private sector. However, they suggest that government deficit spending on infrastructure and some social amenities such as education and health need not crowd-out the private sector. This is because the private sector indirectly gains through improved infrastructural facilities, improved and healthy labour force.

Paiko (2013) examines the effect of deficit financing on private sector using OLS concludes that government fiscal deficit has a strong and significant adverse effect on domestic private investment in Nigeria.

III.   Methodology Of The Study

The study uses secondary data sourced from Central Bank of Nigeria (CBN) statistical Bulletin (Various issues). The model specified is: DPI = f (GFD and INT). The equation is $DPI = a_0 + a_1 GFD + a_2 INT + \mu$ where DPI devotes Domestic private Investment proxied by banks credit to the private sector.

GFD denotes Government fiscal Deficits

INT denotes Real Interest Rate

a_o is the intercept while a_1, and a_2 are the coefficients of explanatory variables. Ordinary Least Squares (OLS) techniques are used for regression analysis.

IV.   Data Analysis And Interpretation

The preliminary tests are Unit Root and Cointegration tests. Unit root test is to establish stationarity of data. Unit root tests were done using Augmented Dickey-Fuller (ADF) as well as Phillip-Peron (P-P) methods.

Table II: Unit Root Result For ADF.

VARIABLES	ADF	ORDER OF INTEGRATION	SIGNIFICANCE LEVEL
GFD	-5.391831	I (0)	1%
INT	-9.565603	I (1)	1%
DPI	-8.060052	I (0)	1%
ECM	-10.34914	I (1)	1%

From the above Table I, it is seen that GFD and DPI are stationary at levels while INT and ECM are stationary at first difference. That means all variables are stationary at 1% level of significance.

Table II: Unit Root Test For P-P

VARIABLES	ADF	ORDER OF INTEGRATION	SIGNIFICANCE LEVEL
GFD	-5.391831	I (0)	1%
INT	-9.724965	I (1)	1%
DPI	-7.984692	I (1)	1%
ECM	-10.34914	I (1)	1%

From Table II, we observe that GFD integrate at level while others are stationary at first difference. This means that there is stationary at 1% significance level.

Co-Integration Test

A co-integration test is performed using Johansen estimating techniques. This is done to test for long-run equilibrium relationship exists among the variables.

Table III Johansen's Co-Integration Test
Unrestricted Co-integration Rank Test

No of C.E.	Eigen value	Trace Statistics	(Trace) 0.05 Critical Value	Probability
None*	0.716 880	61.75199	27.75199	0.0000
At most 1	0.131 895	8.752818	8.752818	0.3887
At most 2	0.064 766	2.812246	2.812246	0.0936

Trace statistic indicates 1 co-integrating equation (CE) at 5% significance level.
*Denotes rejection of the hypothesis.

Table IV Unrestricted Co-Integration Rank Test (Maximum Eigen Value)

Hypothesized No of C.E.	Eigen Value	Max-Eigen Statistics	5% Critical value	Probability
None*	0.716 880	5.99917	21.13162	0.0000
At least 1	0.131 895	5.940572	14.26460	0.6209
At least 2	0.064 766	2.712246	3.841466	0.0935

Max- Eigen value test indicates 1 co-integrating equation (C.E) at 0.05 significance level.
*Denotes rejection of the hypothesis at 5% level.

From tables III and IV we observe that both Trace test statistic and the max-eigen value test indicate one (1) co-integration equation of 5% significance level. We can then say that a long run relationship exists among the variables.

Data Analysis And Interpretation

Variable	Coefficient	t-statistics	P-Value	Remarks
CONSTANT	-2.598	-1.982	0.104	Insignificant
Ln GFD	0.774	4.616	0.006	Significant
RIR	0.494	5.929	0.002	Significant

Adj R^2 0.919   P-Value 0.001   -   significant

F-Value 40.666   Durbin-Watson 2.932

Regression Equation is DPI = -2.598 + 0.774GFD + 0.494RIR

V. Interpretation Of OLS Results

The coefficient of Government Fiscal Deficits (LnGFD) is 0.774 and that of Real Interest Rate (RIR) is o.494. That means that GFD and RIR have positive relationship with Domestic Private Investment (DPI). This implies that a unit increase in GFD increases DPI by 77% while a unit increase in RIR increases DPI by 49%. These results agree with the work of Mitra (2007) whose finding is that government fiscal deficit in India crowds-in the private sector. The t-statistics at 5% significance level indicate that LnGFD and RIR are significant. This shows that there is significant and positive relationship between government fiscal deficits (GFD) and domestic private investment (DPI) as well as between real interest rate (RIR) and domestic private investment. The overall significance of the explanatory variables is captured in F-statistics of 40.666 with probability (p-value) of 0.001. The F-statistics show the overall significance of the model. Since the p-value is less that 5% we conclude that the explanatory variables have combined significant effect on the dependent variables, domestic private investment (DPI). That means that government fiscal deficits and interest rate do not adversely affect domestic private investment. The result of the adjusted coefficient of determination (Adj R^2) indicates that 92% of changes in domestic private investment can be explained by government fiscal deficits. One can further add that government fiscal deficits, as in the case of India (Mitra 2007) do not crowd-out domestic private investment in Nigeria. One can also suggest that government deficits complement the private sector by providing infrastructure and other social facilities such as education and health. Education ensures quality of the work force and health provides a healthy work force. When we consider that interest rate is positive, we may see this as a result that the domestic financial sector is not fully developed so that the interest rates are not market-driven. In fact, it can be said that lending to the private sector are interest inelastic.

Hypotheses Testing
The Null hypotheses shown in section I are restated here for convenience.

Hypothesis I

H_{01} Government fiscal Deficits do not have significant and positive effect on Domestic Private Investment in Nigeria. When we look at Table V, we see that computed t-statistics value for government fiscal deficits 4.616 and it is greater than critical value of 2. This means that it is statistically significant and it is positive. We then reject the Null and accept Alternative hypothesis that government fiscal deficits have significant and positive effect on domestic private investment in Nigeria. This suggests that government fiscal deficits crowd-in rather than crowd-out the private sector investments. This finding agrees with the finding of Mitra (2007) in his study of India.

Hypothesis Ii

H_{02} Real Interest Rate (lending) do not have significant and positive effect on domestic private investment in Nigeria. Going back to Table V, we see that t-statistics value of 5.929 is greater than critical value of 2. It is, therefore, statistically significant and it positive. We reject the Null and accept Alternative hypothesis. That means that changes in real interest rates do not adversely affect domestic private investment in Nigeria. This also implies that domestic private investors are influenced by other factors outside interest rate. We can also add that with low level of development of the financial market, interest rates are not market-driven.

VI. Conclusion And Recommendation

Conclusively, the study found that government fiscal deficits have no significant and positive effect on domestic private investment in Nigeria. In other words, one can conclude that government fiscal deficits do not crowd-out the private sector. Also with low development of financial markets, government local borrowing may not act seriously against ability of the private sector borrow.

Again, from hypothesis 2, it seen that government fiscal deficits have significant positive effect on banks lending interest rate. This means that changes in fiscal deficits do not have serious effect on lending interest rate. This does not agree with a priori expectation that it should be negative and supported by the study of Alani (2006) but rejected by the work of Obi and Abu (2008).

In the light of these, we recommend that first, since its fiscal deficits do not affect domestic private investment, it should continue to develop infrastructure from which the private sector will indirectly benefit (Looney, 1995). Second since government fiscal deficit has significant and positive effect on interest rates, the crowding out effect has not posed any problem. One may see government fiscal deficit as complementary to the domestic private investment (Alani 2006). This is also, possible due to the fact that lending interest rate is related more to monetary policy action of the central bank then fiscal actions.

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Appendix Data For Variables

Year	DP/N bn	Real Int rate %	GFD N bn
1970	358.45	8.0	-455.10
1971	540.35	10.0	171.60
1972	651.73	10.0	-58.80
1973	749.85	10.0	166.10
1974	899.12	10.0	1796.40
1975	1339.22	9.0	427.90
1976	2064.43	10.0	-1090.80
1977	2872.32	6.0	-781.41
1978	4059.86	11.0	-282.90
1979	4902.10	11.0	1461.70
1980	6234.23	9.5	-1975.20
1981	8590.05	10.0	-3902.10
1982	10668.34	11.5	-6104.10
1983	11668.04	11.5	-3364.50
1984	12462.93	13.0	-2660.40
1985	13070.34	11.75	-3039.70
1986	15247.45	10.5	-8245.30
1987	21082.99	17.5	-5889.70
1988	27326.42	16.5	-12160.90
1989	30403.22	26.8	-15134.70
1990	33547.70	25.5	-22116.10
1991	41362.46	20.01	-35755.20
1992	58122.95	29.80	-39532.50
1993	127117.71	18.32	-107735.30
1994	143424.21	21.0	-70270.60
1995	180004.76	20.18	-133389.90
1996	238596.56	19.74	1000.00
1997	316207.08	13.54	32049.40
1998	315956.19	18.29	-5000.00
1999	431168.36	21.32	-285104.70
2000	530373.30	22.15	-296105.70
2001	764961.52	18.29	-103777.30
2000	9304493.90	24.40	-301401.70
2003	1096535.57	20.48	-202724.70
2004	1421664.03	19.15	-172601.30
2005	1838389.93	17.85	-161406.30
2006	2290617.76	17.3	-101397.50

2007	3668657.82	16.94	-11723.50
2008	6920498.75	15.15	-47378.50
2009	9102049.11	18.36	-810008.50
2010	10157021.18	17.36	-1105439.80
2011	10660071.84	23.32	-11300388.30
2012	14649276.46	22.39	-1238364.00
2013	12654674.10	22.85	6269376.15

SOURCE: CBN Statistical Bulletin (Various issues)