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FISCAL POLICY MANAGEMENT AND PRIVATE INVESTMENT IN NIGERIA: CROWDING-OUT OR CROWDING-IN EFFECT?

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Abstract: The Nigerian government over the years embarked on diverse macroeconomic policy options to tinker the economy on the path of growth and development. Amongst the policy options readily employed is that of fiscal policy. Despite the lofty place of fiscal policy in the management of the Nigerian economy, the economy is yet to come on the path of sound growth and development. The intent of fiscal management is essentially to stimulate economic and social development by pursuing a policy stance that ensures a sense of balance between taxation, expenditure and borrowing that is consistent with sustainable growth. However, the extent to which fiscal management engenders private investment continues to attract theoretical and empirical debate especially in developing countries like Nigeria. In light of this, the present study examines whether there exists a crowding-out or crowding-in effect of fiscal policy on private investment in Nigeria between 1987 and 2015. Secondary time series data were used for the study and these were sourced from CBN statistical bulletin and World Development Indicators, 2015. The data collected were analyzed using the Autoregressive Distributed Lag with inferences drawn at 5% significance level. The result showed that inflation, capital expenditure, indirect tax and non-tax revenue had positive and significant effects on private investment in Nigeria while domestic credit to private sector had negative but significant effect on private investment in Nigeria within the period. The study concluded that a crowding-in relationship exists between capital expenditure and private investment, while indirect tax revenue has significant and non-distortionary relationship with private investment. The study therefore recommends more public investment in capital projects and that the tax system should generally be made favorable towards private sector investment.

Keywords: Fiscal management; Private investment; Macroeconomic policy; Economic development.
JEL Classification: H30; E22; O23; O11

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Introduction

The emphasis on private sector led growth started as far back as the early 1980s (Kajimbwa, 2013). Many developing countries were confronted with a profound slowdown in economic growth. Nigeria, for instance, suffered from this due to the 1980s oil glut where her per capita GDP fell from $1100 to $340 and also as international crude oil price sells for about $50 per

barrel in first quarter of 2017 as against $120 per barrel in the third quarter of 2014. Oshikoya (1994) revealed that the average growth rate of real GDP per capita in developing nations fell from 0.4% per annum between 1970s and 1980s to –1.2% per year between 1980 and 1989. The significant fall in gross rates of investment may perhaps reflect many factors that have seriously affected many less developed countries during the 1980s. On the average, the proportion of total domestic investment in the gross domestic product fell from approximately 20.8% per year during 1973-80 to 1.1% per year during 1980-89.

Having recognized the need for a change of approach, developing countries shifted focus to growing the private sector. Arising from the above, the Nigerian government over the years embarked on diverse macroeconomic policy options to tinker the economy on the path of growth and development. Amongst the policy options readily employed is that of fiscal policy. Medee and Nenbee (2011) noted that despite the lofty place of fiscal policy in the management of the Nigeria economy, the economy is yet to come on the path of sound growth and development while Audu (2012) asserted that the growth and development of the Nigerian economy has not been stable over the years and as a result, the country's economy has witnessed so many shocks and disturbances both internally and externally over the decades. Internally, the unstable investment and consumption patterns as well as the improper implementation of public policies, changes in future expectations and the accelerator are some of the factors responsible for it. Similarly, the external factors identified are wars, revolutions, population growth rates and migration, technological transfer and changes as well as the openness of the Nigerian economy are some of the factors responsible.

The management of the Nigerian economy in order to achieve macroeconomic stability has been unproductive and negative hence one cannot say that Nigeria economy is performing. This is evidence in the adverse inflationary trend, government fiscal policies, undulating foreign exchange rates, the fall and rise of gross domestic product, unfavourable balance of payments as well as increasing unemployment rates are all symptoms of growing macroeconomic instability. As such, the Nigerian economy is unable to function well in an environment where there is low capacity utilization attributed to shortage in foreign exchange as well as the volatile and unpredictable fiscal policies in Nigeria (Isaksson, 2001). The intent of fiscal policy is essentially to stimulate economic and social development by pursuing a policy stance that ensures a sense of balance between taxation, expenditure and borrowing that is consistent with sustainable growth. However, the extent to which fiscal policy engenders private investment continues to attract theoretical and empirical debate especially in developing countries like Nigeria. Thus, one continues to wonder if the theoretical linkage between fiscal policy variables and private investment is actually attainable in the Nigerian economy. On the basis of this, this study finds it necessary to examine the relationship between fiscal policy variables and private investment in Nigeria between 1987 and 2015.

It is noteworthy to point out that several studies, cross-country and country-specific, have explored issues around fiscal policy; however studies examining its effect on private investment are few in Nigeria. For instance, Alesina et al., (2002) evaluated the effects of

fiscal policy on investment using a panel of OECD countries and found that public spending has a sizable negative effect on business investment which is significantly greater than the effect of various types of taxes on business investment. Omitogun and Ayinla (2007) examined empirically the contribution of fiscal policy in the achievement of sustainable economic growth in Nigeria. They used Solow growth model estimated with the use of ordinary least square method and found out that fiscal policy has not been effective in the area of promoting sustainable economic growth in Nigeria. They suggested that Nigerian government should put a stop to the incessant unproductive foreign borrowing, wasteful spending and uncontrolled money supply and embark on specific policies aimed at achieving increased and sustainable productivity in all sectors of the economy.

Marratin and Salotti (2010) conducted a study on the relationship between fiscal policy and private investment of 14 EU countries and found that state expenditure shocks have positive effect on private investment. The study suggested that remuneration-related public expenditure has a relatively higher stimulating effect, whereas government investment has no stimulating effect on private investment. Abata, Kehinde and Bolarinwa (2012) assessed how fiscal and monetary policies influence economic growth and development in Nigeria. From the result there exist a mild long-run equilibrium relationship between economic growth and fiscal policy variables in Nigeria. The study suggests that for any meaningful progress towards fiscal prudence on the part of Government to occur, some powerful pro-stability stakeholders strong enough to challenge government fiscal recklessness will need to emerge.

Isaac and Samuel (2012) investigated the effects of fiscal policy on investment and economic growth in Kenya, the study used a time series data from 1973 to 2009. They adopted two stage instrumental variable estimation method to perform the regression analysis because of its adaptability. The results indicate that fiscal policy impacts on investment and investment plays a major role in the determination of the economic growth in Kenya. They recommend that the following three measures can be adopted accordingly: re-examination of government spending to eventually make it complementary to investment, channeling more credit to the private sector and finally designing appropriate policies that deal with the current high domestic public debt and budget deficit.

Sineviciene and Vasiliauskaite (2012) analysed the relationship between fiscal policy and private investment in the Baltic States of Estonia, Latvia and Lithuania. The study showed that from the tax revenue side, the strongest relationship exists between the current taxes on income, wealth and private investment. Analysis of fiscal policy indicators interaction with private investment from the government expenditure side showed the existence of strongest relationship between public and private investment thereby leading to suggestions that fiscal policy indicators explain fluctuations in private investment in the Baltic States. Nathan (2013) evaluates the causal relationship between money supply, fiscal deficits and exports as a means of analyzing the impact of fiscal policy on the growth of the Nigerian economy between 1970 and 2010. The research employed the Co-integration Error Correction Mechanism (ECM), a two band recursive least square to test for the stability of the Nigerian economy as well as determine the effect of money

supply, fiscal deficits, and exports on the relative effectiveness of fiscal policies in the Nigerian economy. The study reveals that there is a significant causal relationship between gross domestic product (GDP) and the variables used in this research. They also concluded that there was a significant causal relationship between exports and gross domestic product and hence fiscal policies. Conclusively, on the whole, they recommend that fiscal policies have a significant influence on the output growth of the Nigeria economy.

Malik (2013) examined linear as well as non-linear impact of fiscal policy variables on private investment in Pakistan from 1972 to 2009 using time series data. The results imply that it's better to examine different aspects of fiscal policy instead of fiscal policy variables in aggregate form as the impact of fiscal policy variables in aggregate and disaggregate form do not comply with each other. Different categories of expenditures and revenues have different impact on private investment. Secondly, in most of the cases there exists a non-linear relationship, which implies the significance of certain threshold level for the different fiscal policy instruments to encourage private investment. Okoro (2013) investigated the impact of government spending on the Nigerian economic growth from 1980 to 2011. Employing the ordinary least square multiple regression analysis to estimate the model specified. Real Gross Domestic Product (RGDP) was adopted as the dependent variable while government capital expenditure (GCEXP) and government recurrent expenditure (GREXP) represents the independent variables. With the application of Granger Causality test, Johansen Co-integration Test and Error Correction Mechanism, the result shows that there exists a long-run equilibrium relationship between government spending and economic growth in Nigeria.

Oyeleke and Ajilore (2014) investigated the sustainability of fiscal policy in Nigeria over the period of 1980-2010 to determine whether or not the government has violated inter-temporal government budget constraint. Using error correction method of analysis, the study revealed that fiscal policy was weakly sustainable in the economy of Nigeria. This study therefore recommends that government should improve on her tax revenue generation and other source of income but limit her expenditure to growth enhancing projects.

Agu et al., (2014) examined the impact of various components of fiscal policy on the Nigerian economy from 1961 to 2010. Descriptive statistics was used to show contribution of government fiscal policy to economic growth. An OLS in a multiple form was used to ascertain the relationship between economic growth and government expenditure components after ensuring data stationarity. Findings revealed that total government expenditures have tended to increase with government revenue, with expenditures peaking faster than revenue. Investment expenditures were much lower than recurrent expenditures evidencing the poor growth in the country's economy. Hence there is some evidence of positive correlation between government expenditure on economic services and economic growth. An increase in budgetary allocation to economic services will lead to an enhancement in economic stability.

Mgbemena, Nwogwugwu and Chris (2015) investigated the determinants of private investment in Nigeria's manufacturing sub-sector between the periods 1975 to 2013 using annual time series data sourced from Central Bank of Nigeria Statistical Bulletin of various issues. In carrying out the study, econometric techniques were employed to analyze the data collected. However, stationary and co-integration tests of the variables were examined using Augmented Dickey – Fuller and Johansen co-integration tests respectively. Also, an endogenous growth model was specified and estimated using error correction mechanism (ECM) technique in order to test for the dynamic characteristics of the variables in the model. The results show that the main determinant of private investment in the manufacturing sub- sector of the Nigerian economy is interest rate, exchange rate and public sector investment. The study concludes that the empirically identified factors influencing private sector investment should be well – managed by the government to boost private investment in the manufacturing sub- sector and to ensure to the complete diversification of the Nigerian economy. Agu (2015) discussed the determinants of private investment in Nigeria from 1970 – 2012. The study employs the Error-Correction modeling procedure which minimizes the likelihood of estimating spurious relations, while at the same time retaining long-run information. The results of the analysis show that the investment rate is positively correlated with both the growth rate of disposable income and the real interest rate on bank deposits. The study discovered that investment has been slowed down in Nigeria as a result of increased lending rate, reduced public expenditure, reduced savings, political instability and inadequate infrastructure. The study recommends among others things that the focus of development policy in Nigeria should be to increase the productive base of the economy in order to promote real income growth and reduce unemployment. For this to be achieved, a diversification of the country's resource base is indispensable.

Babalola (2015) examined the short and long run impact of fiscal policy on economic development in Nigeria between a period of 1981 and 2013 using annual time series data and VAR model. The study used government recurrent expenditure, government capital expenditure, government investment and tax revenue to indicate fiscal policy. Economic development was proxy by real per capita income. The model was estimated using Pair-wise Correlation to ascertain the relationship and then Co-integration and Error Correction Mechanism for impact after confirming the data's stationarity using Unit Root. The result showed that government recurrent expenditure and government investment have significant positive impact on economic development in both the short and long run within the period under consideration. Capital expenditure appeared to have a short run positive impact but not in the long run. Tax revenue had an inverse significant impact in both short and long run. The speed of adjustment to equilibrium was found to be high. The results are all in line with theories and previous studies.

Research Method

The accelerator theory and the neoclassical theory of investment are the theories upon which this study is based, owing to the fact that they present investment as a positive function of growth in real output (accelerator theory) and the user cost of capital as well

as level of output (neoclassical theory). We also introduce the Keynesian-classical crowding in/crowding out argument as a third theoretical underpinning to justify the introduction of fiscal policy variables in the model.

In analyzing the impact of fiscal policy on private investment in Nigeria, we shall derive a basic investment model that reflects the behavior of investment in a developing country context. This enables us to build on the accelerator and neoclassical theories and also include fiscal policy variables in line with the Classical-Keynesian argument about crowding out/crowding in.

Hence, we consider the relation proposed by Jorgensen (1967) as to the maximization function of a firm:

$$V(0) = \max E_{\phi} \int_0^{\infty} \pi(t) e^{-rt} dt = E_{\phi} \int_0^{\infty} [p(t)Y(t) - s(t)I(t) - w(t)L(t)] e^{-rt} dt \quad (1)$$

Subject to:

$$\frac{dK}{dt} = I(t) - \delta K(t) \text{ where } K(0) \text{ is given} \quad (2)$$

Where π(t) denotes profit, p(t) denotes output price, s(t) denotes capital price, w(t) is the wage, Y(t) denotes output, I(t) denotes investment, L(t) denotes labor, δ denotes depreciation and E is the expectations operator conditional on the information set, φ, available for the firm in each period. By optimizing this relation, we are able to determine Jorgenson's optimal capital stock of the firm as follows:

$$K^* = \frac{P \alpha Y}{C} \quad (3)$$

Transforming this, we have a relation between desired optimal capital stock(K^*), price of output (P), output (Y) and user cost of capital (C).

$$K_{it}^* = \phi P_{it} Y_{it} C_{it}^{-\sigma} \quad (4)$$

Where ∅ and σ represent the distribution parameter and the constant elasticity of substitution between capital stock and labour respectively. An investment function generally entails gross investment being split up into net investment and the replacement components of worn out capital. In this analysis, we are concerned with the net investment component and as thus, we ignore the replacement component. The net investment component (I_{it}^n) is equal to the change in desired capital stock:

$$I_{it}^n = \Delta K_t^* \quad (5)$$

Substituting (4) into (5) and assuming a unitary elasticity of substitution between capital and labour and adding the error term, we are able to derive our investment model as follows:

$$I_{it} = \phi_1 \Delta Y_{it} + \phi_2 \Delta P_{it} + \phi_3 \Delta C_{it} + \mu_{it} \quad (6)$$

We now augment equation (6) with fiscal policy variables. Following the work of Malik (2013), we disaggregate fiscal policy into its revenue and expenditure components. This disaggregation is informed by the need to evaluate the effect of different fiscal policy components on private investment and determine whether there is a crowding in or crowding out. We also further disaggregate expenditure into productive and non-productive expenditure; and revenue into distortionary and non-distortionary revenue.

Productive expenditure is government expenditure that is expected to enter the production function of private firms, increasing returns to investment and fostering economic growth. According to Soli et al (2008), productive expenditure enters the production function of private firms while non-productive expenditure only ends up in the utility function. For the purpose of the study, we define productive expenditure as capital expenditure while non-productive expenditure entails all forms of recurrent expenditure (e.g. wage and salary bill of the public services and purchases of goods and services by the government). On the revenue side, distortionary revenue is one which serves as a disincentive to invest (save), hence, exerts a negative influence on economic growth. Revenues which encourage savings and exert positive influence on growth are non-distortionary. Although they may affect the labour/leisure choice, they do not reduce returns to investment. We shall assume that direct taxes (property and income taxes) are distortionary in nature while indirect taxes (consumption-based taxes) and non-tax revenue are non-distortionary.

The econometric model to be used for estimation is specified thus:

$$PI_t = \alpha + \sum_{j=1}^{n} \beta_j X_{tj} + \sum_{k=1}^{n} \delta_k FP_{tk} + \mu_t \quad (7)$$

PI_{it} is private investment (is indicated by gross fixed capital formation), X_{itj} is a set of j conditioning variables (i.e. inflation (X_1) and domestic credit to private sector (X_2)), FP_{itk} is a set of k fiscal policy variables (i.e. capital expenditure (FP_1), recurrent expenditure (FP_2), direct taxes (FP_3), indirect taxes (FP_4) and non-tax revenue (FP_5), α is intercept or constant term; β_{1-2} and δ_{1-5} represent the various parameter estimates measuring the impacts of the explanatory variables and μ_t is the error term.

The a priori expectations of the signs of the parameters of the model are given as follows:

$$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \delta_1 > 0, \delta_2 < 0, \delta_3 < 0, \delta_4 > 0, \delta_5 > 0$$

The neoclassical theory informs the a priori expectations for changes in price level (inflation) which is positively related to investment (i.e. $\beta_1 > 0$). The relationship between

domestic credit to private sector and private sector investment is also expected to be positive (i.e. $\beta_3 > 0$). With regards to the fiscal policy variables, the a priori expectation is that productive expenditures (which enter the production functions of firms) (i.e. capital expenditure) and non-distortionary revenue (which do not reduce returns to investment) are positively related to private investment. In other words, the coefficients of capital expenditure, indirect taxes, non-tax revenue are expected to be positive (i.e. $\delta_1, \delta_4, \delta_5 > 0$). On the other hand, unproductive expenditures (i.e. re-current expenditure) and distortionary revenue are hypothesized to be negatively related to private investment (i.e. $\delta_2, \delta_3 < 0$).

The data employed in this study are secondary data. The study employed annual time series data spanning through the period of 1987-2015. The choice of time frame was informed by the numerous fiscal policy reforms that took place since the adoption of structural adjustment program (SAP) in Nigeria in 1986. The data series were adapted from the CBN Statistical Bulletin (2015) and World Bank Development Indicators (2015).

In analyzing the relationship between fiscal policy and private investment in Nigeria, the study made use of a 2-stage econometric procedure. First, the Augmented Dickey-Fuller (ADF) test was undertaken to ascertain the order of integration of the variables, and then the Auto Regressive and Distributed Lag (ARDL) model was employed to account for long-run and short-run relationship in the model. The ARDL model was introduced originally by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). The ARDL approach has the advantage that it does not require all variables to be I(1) as the Johansen framework and it is still applicable if we have I(0) and I(1) variables in our set.

Result and Discussion

Descriptive Statistic and Correlation Matrix

This study commenced its empirical analysis by examining the characteristics of the variables of estimate. From table 1, standard deviation showed that inflation rate (19.295) was the most volatile variable in the time series while domestic credit to private sector (0.34) was the least volatile variable. The skewness statistic showed that capital expenditure (CEXP), recurrent expenditure (REXP) and non-tax revenue (NTR) were negatively skewed while private investment (PI), domestic credit to private sector (DCPS), inflation rate (INF), direct tax (DTAX) and indirect tax (ITAX) were positively skewed. The kurtosis statistics showed that private investment, capital expenditure, recurrent expenditure, direct tax, indirect tax and non-tax revenue were platykurtic, suggesting that their distributions were flat relative to normal distribution while domestic credit to private sector and interest rate were leptokurtic, suggesting that their distributions were peaked relative to normal distribution. Finally, the Jarque-Bera statistic rejected the null hypothesis of normal distribution for domestic credit to private sector, interest rate and indirect tax at five percent critical value while the null hypotheses of normal distribution for the other variables were accepted at the same critical value.

Table 1 Descriptive Statistics

Variables	LOG (PI)	LOG (DCPS)	INF	LOG (CEXP)	LOG (REXP)	LOG (DTAX)	LOG (ITAX)	LOG (NTR)
Mean	26.968	23.338	21.131	26.082	26.738	26.391	24.240	26.193
Std. Dev.	2.102	0.340	19.295	1.554	1.793	0.948	0.604	2.093
Skewness	0.096	1.555	1.438	-0.889	-0.357	0.591	0.941	-0.284
Kurtosis	1.931	5.684	3.585	2.585	1.773	1.590	2.094	1.562
Jarque-Bera	1.424	20.394	10.406	4.027	2.436	4.090	5.268	2.890
Probability	0.491	0.000	0.006	0.134	0.296	0.129	0.072	0.236
Observations	29	29	29	29	29	29	29	29

Source: Author, 2018

The result in table 2 gives a preliminary idea of the relationship among private investment (PI), domestic credit to private sector (DCPS), inflation rate (INF), capital expenditure (CEXP), recurrent expenditure (REXP), direct tax (DTAX), indirect tax (ITAX) and non-tax revenue (NTR). A brief look at the table shows that DCPS has a positive relationship with PI, INF has a negative relationship with both PI and DCPS, CEXP has a positive relationship with both PI and DCPS but a negative relationship with INF, REXP has a positive relationship with PI, DCPS and CEXP but a negative relationship with INF, DTAX has a positive relationship with PI, DCPS, CEXP and REXP but a negative relationship with INF, ITAX has a positive relationship with PI, DCPS, CEXP, REXP and DTAX but a negative relationship with INF, while NTR has a positive relationship with PI, DCPS, CEXP, REXP, DTAX and ITAX but a positive relationship with INF.

However, correlation should not be seen as causality. This is because correlation between two totally unrelated series could be strong while causality between the same variables may be non-existent.

Table 2 Correlation Matrix of the Datasets

	LOG (PI)	LOG (DCPS)	INF	LOG (CEXP)	LOG (REXP)	LOG (DTAX)	LOG (ITAX)	LOG (NTR)
LOG(PI)	1.0000							
LOG(DCPS)	0.4026	1.0000						
INF	-0.5019	-0.2458	1.0000					
LOG(CEXP)	0.9081	0.4619	-0.5298	1.0000				
LOG(REXP)	0.9697	0.4763	-0.5251	0.9470	1.0000			
LOG(DTAX)	0.8264	0.5362	-0.3841	0.6645	0.7515	1.0000		
LOG(ITAX)	0.8686	0.3871	-0.3721	0.6480	0.7600	0.9460	1.0000	
LOG(NTR)	0.9558	0.5059	-0.5560	0.9309	0.9886	0.7553	0.7477	1.0000

Source: Author, 2018

The time series properties of the variables was conducted using Augmented Dickey Fuller (ADF) test and the results from this test showed that all the variables were integrated of order one, suggesting that the variables are I(1) series, except recurrent expenditure which was integrated of order zero suggesting that the variable is I(0) series. The appropriate modus operandi of analysis that captures the combination of I(1) and I(0) series variables, according to Pesaran et al., (2001), is the Autoregressive Distributed Lag (ARDL) model.

Table 3 Unit Root Test Result

Augmented Dickey Fuller (ADF) Test			
Variables	**Level**	**1st Difference**	**Status**
LOG(PI)	1.3753	-3.8985	I(1)
LOG(DCPS)	-0.9181	-4.6656	I(1)
INF	-1.6091	-5.6407	I(1)
LOG(CEXP)	0.1069	-6.6632	I(1)
LOG(REXP)	-3.5327	-	I(0)
LOG(DTAX)	0.6397	-3.7415	I(1)
LOG(ITAX)	0.8281	-2.3770	I(1)
LOG(NTR)	0.2579	-3.0410	I(1)
Critical Values	**Level**	**1st Difference**	
1%	-2.6501	-2.6534	
5%	-1.9534	-1.9539	
10%	-1.6098	-1.6096	

Source: Author, 2018

Lag Length Selection

The next step in our analysis is to select the optimal lag length for the cointegration equation based on the hypothesis that the residuals are serially uncorrelated. The lag length which minimizes the Akaike Information Criterion (AIC), Schwarz Criterion (SC) and the Hannan-Quinn Criterion (HQC) and at which the model does not have autocorrelation is the optimal lag length. For this analysis, we made use of the Akaike Information Criterion (AIC) as the choice for the selection of our optimal lag length.

Based on the result in table 4, the lag length which minimizes Akaike Information Criterion (AIC) is lag two, and thus becomes our optimal lag length. Given our optimal lag length, we can proceed to test for long-run relationship among the variables.

Table 4 Lag Length Selection Criteria

Lag length	AIC	SC
1	319.0835	321.7479
2	318.8389*	319.8782

Source: Author, 2018

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The Bound Test

To investigate the presence of long-run relationships among the variables, the bound testing under Pesaran *et al*., (2001) procedure is used. The bound testing procedure is based on the F-test. The F-test is basically a test of the assumption of no cointegration among the variables against the premise of its existence, denoted as:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$$

i.e., there is no cointegration among the variables.

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$

i.e., there is cointegration among the variables.

Table 5 Bound Test Result

F-Statistics	1%		5%		10%	
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
22.87356	2.96	4.26	2.32	3.5	2.03	3.13

Source: Author, 2018

The result of the computed F-value after each variable has been normalised is presented in table 4.5. The F-test for the joint significance of the lagged variables was conducted using the Bound test. The 1% lower and upper bound critical values are 2.96 and 4.26 respectively. The calculated F-value suggests the existence of long-run relationship among the variables since the test statistics of 22.87356 is above the upper bound critical value.

Short-run Relationship

The estimated results presented in table 6 explained the short-run relationship between fiscal policy and private investment in Nigeria. The independent variables explained approximately 99.9% of the total variations in the dependent variable. This showed that the model had a very high goodness of fit. The value of the F-statistic was statistically significant at 1% level indicating that the model was significant. The value of the Durbin-Watson statistic was close to 2 implying that the model had no serial correlation problem.

Table 6 ARDL Short-run Relationship Result

Dependent Variable: DLOG(PI)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.195285	0.021746	8.980253	0.0003**
DLOG(PI(-1))	-0.199574	0.039789	-5.015752	0.1253
DLOG(PI(-2))	-0.103601	0.024830	-4.172379	0.1498
DLOG(DCPS)	-0.351385	0.029437	-11.936967	0.0532
DLOG(DCPS(-1))	-0.123952	0.022142	-5.598021	0.1125
D(INF)	0.008304	0.000398	20.851929	0.0305*
D(INF(-1))	-0.011403	0.000618	-18.441266	0.0345*
DLOG(CEXP)	-0.024045	0.029844	-0.805688	0.5682
DLOG(CEXP(-1))	-0.894029	0.039636	-22.556078	0.0282*
DLOG(REXP)	0.144767	0.021959	6.592707	0.0958
DLOG(REXP(-1))	0.812705	0.043514	18.676802	0.0341*
DLOG(DTAX)	-0.007489	0.040732	-0.183859	0.8842
DLOG(DTAX(-1))	0.101294	0.030023	3.373856	0.1834
DLOG(ITAX)	2.040958	0.157551	12.954181	0.0490*
DLOG(ITAX(-1))	-1.330800	0.118014	-11.276629	0.0563
DLOG(NTR)	0.189492	0.022574	8.394137	0.0755
DLOG(NTR(-1))	-0.972824	0.026890	-36.178263	0.0176*
ECT(-1)	-1.399829	0.048953	-28.595296	0.0223*
R-squared	0.999894	Akaike info criterion		-7.470901
Adjusted R-squared	0.999446	Schwarz criterion		-6.261193
F-statistic	28765.29**	Durbin-Watson stat		1. 838546

Note: *(**) implies 5% (1%) significance level
Source: Author, 2018

The result showed that in the short-run, private investment had a significant negative relationship with one period lag value of inflation rate at 5% level. A unit increase in the one period lag value of inflation rate leads to approximately 0.01 decrease in private investment level. Also, the coefficient of one period lag value of capital expenditure was negative and statistically significant at 5% level of significance. This implies that, in the short run, a unit increase in the value of one period lag value of capital expenditure leads to approximately 0.89 decrease in the value of private investment. Furthermore, the coefficients of one period lag value of non-tax revenue was negative and statistically significant at 5% level of significance, indicating that a unit increase in one period lag value of non-tax revenue leads to approximately 0.02 decreases in the value of private investment in the short-run.

In addition, the result showed that in the short-run, private investment had a significant positive relationship inflation rate at 5% level of significance. A unit increase in the level of inflation rate leads to approximately 0.01 increase in private investment level. Also, the coefficient of one period lag value of recurrent expenditure was positive and statistically significant at 5% level of significance. This implies that, in the short run, a unit increase in the value of one period lag value of recurrent expenditure leads to approximately 0.81 increase in the value of private investment. Furthermore, the coefficient of indirect tax was negative and statistically significant at 5% level of significance, indicating that a unit increase in the value of indirect tax leads to approximately 2.04 increase in the value of private investment in the short run.

Having established the long-run relationship and co-movement among the variables, there was a need to examine the speed of adjustment that took all the variables to converge in the long-run. This test was done using error correction mechanism (ECM). The principle behind the result of the ECM was that the coefficient of the ECM must be negative and significance at 5% level. However, this would be used to calculate the speed of adjustment. That is, the time it takes the variables to converge in the long-run. Therefore, the coefficient of the ECM was negative and significant at 5% as evidence in the table 6.

Long-run Relationship

Table 7 ARDL Long-run Relationship Result

Dependent Variable: LOG(PI)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-16.208694	1.098862	-14.750432	0.0431*
LOG(DCPS)	-0.479298	0.027763	-17.264182	0.0368*
INF	0.016652	0.000874	19.045234	0.0334*
LOG(CEXP)	0.585115	0.014581	40.128978	0.0159*
LOG(REXP)	-0.810126	0.067786	-11.951218	0.0531
LOG(DTAX)	-0.299658	0.066659	-4.495365	0.1393
LOG(ITAX)	1.699040	0.099550	17.067142	0.0373*
LOG(NTR)	1.046006	0.047476	22.032158	0.0289*
R-squared	0.999894	Akaike info criterion		-7.470901
Adjusted R-squared	0.999446	Schwarz criterion		-6.261193
F-statistic	28765.29**	Durbin-Watson stat		1. 838546

Note: *(**) implies 5% (1%) significance level
Source: Author, 2018

Sequel to the co-integration estimate, this study proceeds to analyze the relationship between fiscal policy and private investment in Nigeria. From the regression estimate presented on table 7, the F-statistic (28765.29) showed that the model was well specified and it was statistically significant at 1% level of significant. The coefficient of determination (R2) of the model was very high (99%) indicating that independent variables explained total variation of about 99% of variations in exchange rate, while the Durbin-Watson Stat. of 1.83 showed that the estimate from the regression model can be used for policy inference. The regression estimate showed that recurrent expenditure and direct tax had negative but insignificant effect on private investment in Nigeria. As observed in the regression estimate presented in table 7, the effects of recurrent expenditure and direct tax were insignificant in influencing private investment over the study periods. In contrast to the above, three of the measures of fiscal policy used (capital expenditure, indirect tax and non-tax revenue) had positive and significant effects on private investment in Nigeria. Specifically, a unit increase in capital expenditure, indirect tax and non-tax revenue would lead to an increase in private investment by 0.59, 1.70 and 1.05 respectively. Also, the coefficient of inflation rate was positive and statistically significant at 5% level of significance. This implies that a unit increase in inflation rate leads to approximately 0.02 decrease in private investment. With respect to domestic credit to private sector, the regression estimate on table 7 showed that domestic credit to private sector had negative but significant effect on private investment in Nigeria. This suggests that an increase in the domestic credit to private sector would result in a decrease in exchange rate by 0.48. The rationale behind the negative relationship between domestic credit to private sector and private investment is that when interest rates are too high, it discourages investors from accessing credits from the banks, and subsequently decreases private investment in the economy. Also some of those who take the loans at such outrageous rates simply abscond with the money and never invest it. That is why we have several cases of loan defaults in Nigeria today.

With respect to the focus of this study, the regression estimate showed that some fiscal policy variables positively and significantly influenced private investment in Nigeria. This implies that the increase in capital expenditure, indirect tax and non-tax revenue over the period of this study had caused an increase in the level of investment in the country. This suggests that fiscal policy variables are factors influencing private investment in Nigeria.

Post-Estimation Results

In addition to the regression estimates, this study conducted some diagnostic tests such as the residual tests (which include Normality test and Heteroscedasticity ARCH test). The F-statistics of the Heteroscedasticity ARCH test was insignificant confirming the absence of serial correlation in the residual of the regression estimate. The implication is that the regression estimate was appropriately estimated. From Figure 1, the Jarque-Bera statistics of the Normality test was insignificant suggesting that the residual of the regression estimate is normally distributed.

Table 8 Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	**0.829325**	**Prob. F(8,17)**	**0.5890**
Obs*R-squared	7.298604	Prob. Chi-Square(8)	0.5048

Source: Author, 2018

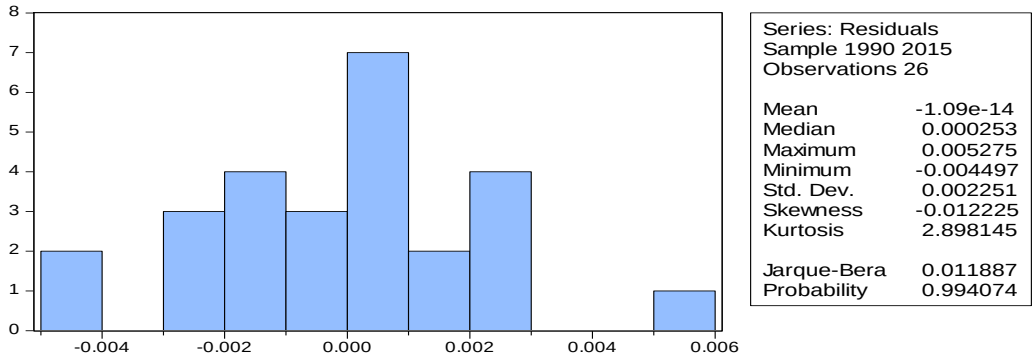

Figure 1 Normality Test
Source: Author, 2018

Conclusion

The study noted that there was a long-run positive and significant relationship between private investment and inflation, capital expenditure, indirect tax and non-tax revenue, and a long-run negative and significant relationship between private investment and domestic credit to private sector. It was discovered that a crowding-in relationship exists between capital expenditure and private investment giving credence to the Keynesian argument which is theoretically fit to the characteristics of developing economies (including Nigeria) such as excess capacity, unemployment, etc. The effect of recurrent expenditure is negative but insignificant. Hence, the results generally show a crowding-in effect of total expenditure. Another major finding from the study is that indirect tax revenue has positive and significant relationship with private investment, i.e. it is non-distortionary. This can be attributed to the low effectiveness of the indirect tax system of Nigeria which limits the distortionary effect of taxes on the economy at macro level. The rationale behind the negative relationship between domestic credit to private sector and private investment is that when interest rates are too high, it discourages investors from accessing credits from the banks, and subsequently decreases private investment in the economy. Also some of those who take the loans at such outrageous rates simply abscond with the money and never invest it. That is why we have several cases of loan defaults in Nigeria today.

Recommendations

The study advocates for more public investment in capital project. This is believed to stimulate private sector investment and in turn, spur economic growth. The tax system should also be restructured to ensure that more revenue comes from indirect tax sources.

This is because as indirect tax is found to be non-distortionary, increases in revenue from this source would not disrupt investment decisions of the private sector. Also, the tax system should generally be made favorable towards private sector investments e.g. through tax incentives. In the same vein, private sector investment should be encouraged owing to its causal effect on growth which has been theoretically and empirically proven to be positive. Fiscal policy variables with significant crowding in effect should be more efficiently utilized to stimulate private investment so as to impact growth positively over time.

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