

The Impact of Fiscal Policy Variables on Private Investment in Nigeria

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Abstract

Motivated by the need to avoid potential parameter bias associated with previous empirical researches, the current study conducted a disaggregated inquiry of the individual impact of fiscal policy variables on private investment in Nigeria. The empirical investigation adopted the Autoregressive Distributed Lag method which allows for the simultaneous estimation of the short and long-run relationships between variables, removing the problems associated with excluded variables and the existence of autocorrelation. The method was applied to time series data spanning the period 1980-2017, generated using the quantitative and ex- post facto research design. The bounds test results established a co-integrating relationship between private investment and its selected determinants. The empirical findings confirmed that various components of direct taxes retarded the growth of private investment while indirect taxes stimulated the growth of private investment. Government capital spending had a favourable and statistically relevant impact on private investment while public external debt suggested a deleterious effect of inhibiting private investment both in the long and short run. The study recommended harmonizing tax policies to curb multiple taxes and high cost of doing business; and major investment in infrastructures to improve private investment and affect long-term growth positively.

JEL Classification Codes: A22, E62, F16, G18, H26.

1: Introduction

Investment, whether private or public, has been identified as a cornerstone of sustainable growth. In developing countries, since private sector inventiveness and capital is limited, the government must play an active role in encouraging investment and economic growth (Osinubi & Amaghionyeodiwe, 2010). To build the infrastructure and social capital necessary for private sector investment, public investment is required. Therefore, public investment in the key sectors of the economy should serve as a facilitator for the growth of the entire economy. Nevertheless, public investment is commonly made for political purposes and therefore lacks economic justification. Conventional wisdom suggest that private sector investment contributes more positively and has a greater impact on growth than public sector investment. As a consequence of the comparatively lower level of corruption in the private sector, productivity in the private sector is usually higher than that of the public sector. Private investment is capable of mobilizing resources and making wise investment choices that increase the economy's productivity and productive potential (Nyoni & Bonga, 2017). The level of growth and development of any economy is a true indicator of the country's capacity to invest and allocate its resources efficiently. Victor & Dickson (2013) noted that the outcome and cause of economic growth is investment. It plays an important role in expanding the output potential and long-term economic growth of an economy. In this regard, the private sector position is important both in contributing to the amount of gross domestic investment and its ability to effectively allocate and employ resources. To this end, steps are taken to promote investment by the government of different countries in order to increase productivity, innovation, level of employment, standard of living, decrease poverty level and eventually accelerate growth (Nwakoby & Bernard, 2016).

The productive and effective use of private resource is a major determinant of sustainable growth in any economy. The revival of market tools as a basis for economic management and the speedy globalisation of economic activities led to a change in emphasis, from government to private sector-led growth strategies, particularly in developing countries. The new paradigm emphasises the hegemony of market forces in the economy, a decrease in public sector production activities and a redefined role of the public sector in the development process under the guiding principle that the public sector should commit its resources to those areas that sustain private investment rather than substitute them (Hermes & Lensink, 2001). In recent decades, Nigeria's private investment has been poor. The policymakers have expressed significant concern that investment is a key variable affecting poverty reduction and sustainable growth. Among other things, a publicly-led development policy was motivated by the oil boom of the 1970s. In order to guarantee government a growing degree of influence over its own resources, public sector supremacy was also dominant. In conjunction with discontent with government enterprise efficiency, the decline in government revenues resulting from the economic crisis of the 1980s forced the country to implement the Structural Adjustment Programme (SAP) in 1986 (Duruechi & Ojiegbe, 2015). Since the need for a change of approach has been recognised, the country has shifted focus to growing the private sector. The much-needed private investment was driven by SAP and other policies. Privatization and commercialization policies have become the order of the day in an attempt to stimulate the private sector (Adejare & Akande, 2017). Until now, these policies have played a major role in redefining the Nigerian economy.

Fiscal policy includes using taxes, government spending to control the trend of economic activities, aggregate demand, production, employment and growth (Ugwuanyi & Ugwunta, 2017). A country's fiscal policy encourages or impedes the growth of private investment depending on their design and execution. In the economy. An expansionary fiscal policy will crowd-out private investment. Productive government spending acts as a stimulant to maximise profit for investors, prompting them to expand their businesses (Barro & Sala-i-Martin, 1992). Government spending on infrastructure, such as transport and communication networks, the provision of electricity and other energy sources facilitates the efficient access of private investor's to productive regions and acts as essential ingredient for growth. On the other hand, if funded by raising taxes or borrowing, public expenditure will crowd-out private investment. High tax burden lowers disposable income for individuals, leading to lower spending, lower savings and therefore lower investment. Therefore, it is important to establish an optimal income tax rate that maximises tax revenue and ensures optimal growth in private investment.

There is a crowding out impact on private investment when borrowing to fund government spending. The cost of borrowing rises as the public and private sectors compete for funds in the capital market, which serves as a deterrent for private investors. In addition, borrowing-funded government spending means that further taxes would be levied to liquidate the debt in the future, which poses an obstruction to private investors (Medee & Nembee, 2011). When government borrowing is expanded to fund higher government expenditure or tax cut, private investment is crowded out by higher interest rates. Long term growth of prospective output can be impaired by a decline in fixed investment by corporations. While higher government expenditure can help in improving infrastructure for promoting private investment, the spike

in government spending if not matched by increased government revenues and equivalent improvement in real GDP, can generate public debt and inflation. Moreover, the higher public spending may put an upward pressure on the interest rate and discourage private investment. The crowding out effect is weakened by the fact that government expenditure through the multiplier increases the demand for private sector goods and thus boosts fixed investment through the accelerator effect (Kengdo et al., 2020).

Given the important role played by private investment both in contributing to GDP growth and in its ability to efficiently allocate and employ resources, Gitahi et al. (2013) argued that developing countries in pursuit of sustainable growth and poverty reduction should aim and maintain level of at least 25 percent of GDP for private investment. Bage (2003), writing on the Asian countries experiences found that investment rates of between 20 and 25 percent could yield growth rate of between 7 and 8 percent. While China has an average private investment as a percentage of GDP ratio of 46 percent between 1993 and 2014, Nigeria's average for the same period was less than 15 percent (Nigerian Investment Promotion Commission, 2018). This percentage is below the levels being experienced in most Sub-Saharan African economies and which is needed to achieve higher growth rates (World Bank, 2015). Despite the substantial increase in government fiscal operations in recent years aimed to achieving increased private sector-led growth, the stylized fact in Nigeria showed that the rate of growth of private investment has been decidedly unimpressive and has continued to stagnate (Ogunjimi, 2019).

The great depressions of the late 1930s and early 1940s brought with it a high degree of government involvement in economic management and fiscal policy instruments are among the policy choices readily employed. What remains open to dispute, however, is what kind of relationship exists between fiscal policy variables and private investment? This controversial field of economic analysis has been explored in the present study by disaggregating fiscal policy variables into their respective components and evaluating their short and long-run impact on private investment in Nigeria using annual time series data from the 1980-2017. Using data-driven economic models to describe the relationships between fiscal policy variables and private investment in Nigeria would allow policymakers implement their methodical analysis in a much more structured, informed and quantified manner for improved policy decisions. The remaining part of the paper is structured as follows: section two presents the theoretical links between investment and fiscal policy variables followed by section three which focuses on the methodological issues, model specification, estimation techniques and procedures that guided the study. Section four addresses the findings and interpretation of the results followed by section five which concludes the study and provides policy recommendations.

2: Theoretical Framework

2.1: Laffer's Curve Theory

The economist Arthur Laffer (1979) developed the Laffer curve model of optimum taxation. The model assumes that government would prefer to raise as much tax revenue as possible, regardless of the tax-

induced productivity losses. The curve describes the theoretical illustration of the relationship between tax-raised government revenue and all possible tax rate. It reflects the volume of tax revenue collected at zero percent and 100 percent severe tax rates. This theory believes that a 100 percent tax rate does not increase government revenue in the same way that zero percent rate of tax does not boost government revenue. This is because, a reasonable taxpayer is no longer motivated to earn more money at a 100 percent tax rate. Thus, government revenue would be 100 percent of nothing. Therefore, it follows that there must be at least one tax rate in-between where tax revenue is maximum (Fave & Dabari, 2017).

The Supply side economists opined that tax rates should generally be kept low and that policymakers will boost the economy in a way that produces more employment than regular government spending. By leaving more money in the free market, the expectation is that businesses will invest money more effectively and contribute more to economic growth. At a time, most economists adopted a Keynesian approach to solving the problem of low aggregate demand, recommending more government spending to increase aggregate demand for products, Laffer countered that the problem was not weak demand. Rather, the burden of heavy taxes and government regulations created inhibitions to production, which depressingly impacts government revenue (Onyinyechi et al., 2016). Laffer contended that the greater the proportion of income or profits collected in the form of taxes from an individual or company, the lesser the willingness to work harder or invest more in the business. A corporation is more likely to find ways to safeguard its capital from taxes or to move all or part of its activities broad. Investors are less likely to risk their capital if a larger proportion of their profits is taken in tax. When workers see increasing portion of their earnings due to increased efforts on their part, collected as taxes, they will lose the encouragement to work harder. For every type of tax, there is a threshold rate above which the motivation to produce more diminishes, thereby reducing the amount of revenue the government receives (Omodero & Alpheaus, 2019).

2.2: Investment Theories

The theoretical literature on investment maintains that fiscal policy can either crowd-in or crowd-out investment depending on how this policy is designed and implemented. Though various theories such as the acceleration theory, neoclassical theory, Tobin's Q theory, etc. explaining the determinants of investment exists in the literature, this paper is limited to a review of only the acceleration theory of investment.

2.2.1: Accelerator Theory of Investment

Clark (1917) explained that demand for capital fluctuates, not with the size of demand for the finished products, but rather with the acceleration of that demand. The accelerator theory states that increasing a company's productivity rate will necessitate a corresponding increase in capital stock. The basic version of this theory proposes that transformation in capital stock is a multiplier function of a change in output. Thus, the basis of investment is adjustment in output. The theory advocates that the demand for

machinery and factories is derived from the demand for products. Therefore, if the demand for products generated by capital equipment is to increase and the current capacity cannot accommodate this anticipated rise in demand, new investment in plant and machinery would be needed to increase production. Changes in production level therefore is positively correlated with the level of business investment as investment is presumed to respond instantaneously and totally to changing market conditions (Gitahi et al., 2013).

The accelerator theory advocates that as demand or profits rises in an economy, so does investment made by businesses. It implies that when demand echelons result in excess demand, companies have 2 options on how to satisfy demand. They either raise prices to cause demand to decrease or increase investment to balance demand (Chenery, 1952). The theory argues that most businesses elect to increase output and increase their profits. The theory further describes how this growth attracts more investors, which in turn accelerates growth (Treadway, 1971). But since the model overlooks the effects of volatility, business aspirations, profits, financial factors and capital expenses on investment, it has been updated over time into the flexible, crowding-in and crowding-out accelerator theory of investment.

The Keynesian crowding-in and Classical crowding-out acceleration theories are the major influences relating fiscal policy variables to private investment in an economy. The Keynesian crowding-in theory presupposes the short-term, underemployment production level with uncertainty in an economy (with aggregate demand falling short of aggregate supply, that is, excess capacity). The theory also presumes that due to this excess capacity, savings and investment are interest rate inelastic. Keynes theorized that fiscal expansion (lowering of tax rates) would increase the disposable income of taxpayers and boost investment in the economy which could further lead to more growth in the economy. The Keynesian economists maintained that fiscal expansion have the proclivity to increase aggregate demand for private sector goods through the fiscal multiplier, thereby stimulating the growth of private investment (Omojolaibi et al, 2016).

The Classical crowding-out acceleration theory of investment supposes a long-term economy, functioning at full employment equilibrium level with no excess capacity, thus, investment and savings are highly interest rate elastic (Twine et al., 2015). The Classical economists reasoned that government active intervention in the management of the economy using expansionary fiscal policy, might result in increased interest rates, lower disposable income and higher wages all of which reduces the profitability of businesses and by extension business investment. This may consequently discourage the growth of businesses and decrease the production level in an economy (Gitahi et al., 2013). The classical economists believed that while government involvement in economic management has an influence on production, such impact is only momentary and in the long run. Its adverse side effect of discouraging private investment does more harm than good to the economy, thereby, rendering fiscal policy variables inefficient and counter-productive in promoting private investment (Omojolaibi et al., 2016).

3: Research Methodology

The methodology for the study was discussed under the following sub-headings: research design, nature and sources of data, specification of the empirical model and estimation procedure.

3.1 Research Design

The purpose of a research design is to certify that the information gathered allows the researcher to effectively address the research problem as logically and unambiguously as possible. Acquiring information relevant to the research problem in social science research, typically includes determining the type of facts required to test a theory, to evaluate a programme, or accurately characterize and evaluate context related to an observable phenomenon. This study adopted the quantitative method and descriptive research design using already existing data to provide empirical answers to the research problems. Descriptive research designs help provide answers to the questions about who, what, when, where and how connected with a research problem. A descriptive research design cannot conclusively establish answers to the why problems associated with a research. It is used to generate information on the current state of the phenomenon and to explain what exists with respect to variables (Ogunjimi, 2019).

3.2 Nature and Sources of Data

The data for this study which are purely secondary were extracted from the Federal Inland Revenue Service (FIRS), Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS) and the World Development Indicators statistical database using the desk survey approach. The macroeconomic variables on which data were collected included the Gross Fixed Capital Formation as a percentage of GDP (GFCF), Direct taxes disaggregated into Petroleum Profit Tax (PPT), Corporate Income Tax (CIT) and Personal Income Tax (PIT), Indirect Taxes represented by Customs and Excise Duties (CED), Government Expenditure disaggregated into Government Capital Expenditure (GCE) and Government Recurrent Expenditure (GRE) and Public Debt disaggregated into Public External Debt (PED) and Government Domestic Debt (GDD). All variables were taken on annual basis in millions of Naira and in percentage running from 1980-2017 making a total of 342 observations. Data on GFCF were sourced from the World Development indicators, PPT, CIT, PIT and CED were sourced from the CBN and FIRS while GCE, GRE, PED and GDD were sourced from the CBN and NBS statistical database. Secondary data were selected as these data had already been checked by experts and other regulatory bodies prior to their publication. However, there is no doubt envisaged about the reliability of the secondary data used, but the possibility of random errors has not been overlooked.

3.3 Specification of the Empirical Model

The model designed to capture the effects of fiscal policy variables on private investment in Nigeria leans very closely on the Keynesian-classical crowding-in and crowding-out acceleration theory of investment

to justify the introduction of fiscal policy variables in the model. The model was formulated to take into account the individual effects of disaggregated fiscal policy variables on private investment following the lead of Gitahi et al (2013) and Omojolaibi et al. (2016) with few modifications to suit the requirements of the current study. The study modelled private investment represented by GFCF as a function of disaggregated fiscal policy variables. The complete structure of the three standard fiscal policy variables were disaggregated into their various components of taxation, government spending and borrowing. This disaggregation was informed by the need to evaluate the individual effects and determine whether there is a crowding- in or crowding-out effect of these variables on private investment. Such a rich environment can overcome variable omission bias thus allowing for a better assessment of the individual effect of each component of fiscal policy variable on private investment. From the foregoing, the empirical model was formulated and specified as follows:

$$\begin{aligned} \Delta GFCF_t = & \beta_0 + \sum_{i=0}^q \beta_1 \Delta LOGPPT_t + \sum_{i=0}^q \beta_2 \Delta LOGCIT_t + \sum_{i=0}^q \beta_3 \Delta LOGPIT_t + \sum_{i=0}^q \beta_4 \\ & \Delta LOGCED_t + \sum_{i=0}^q \beta_5 \Delta LOGGCE_t + \sum_{i=0}^q \beta_6 \Delta LOGGRE_t + \sum_{i=0}^q \beta_7 \Delta LOGGDD_t + \sum_{i=0}^q \beta_8 \\ & \Delta LOGPED_t + \phi_9 GFCF_t + \phi_{10} \Delta LOGPPT_t + \phi_{11} \Delta LOGCIT_t + \phi_{12} \Delta LOGPIT_t + \phi_{13} \Delta LOGCED_t \\ & + \phi_{14} \Delta LOGGCE_t + \phi_{15} \Delta LOGGRE_t + \phi_{16} \Delta LOGGDD_t + \phi_{17} \Delta LOGPED_t + ECM \\ & \dots\dots\dots Eqn. 1 \end{aligned}$$

Where, GFCF is the proxy for private investment and the dependent variable of the model. All variables remain as earlier defined.

Δ = Denotes the first difference operator, t = time trend consisting of years from 1980-2017.

β_0 = Intercept μ = stochastic disturbance or error term.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8 are the long-run multipliers or coefficients of the explanatory variables.

$\phi_{10} - \phi_{17}$ are the short-run dynamics or coefficients of the explanatory variables.

3.4: A Priori Expectation from the Model

The a priori expectations about the signs of the coefficients of the empirical model follow naturally from the analysis of the taxation and investment theories discussed in the theoretical framework. From theoretical literature, the study expects the signs of the coefficients of the various tax revenues to be positively or negatively related to GFCF. That is, $\beta_1, \beta_2, \beta_3$, and $\beta_4 = > \text{ or } < 0$. β_5 and β_6 are the disaggregated coefficients of government expenditure while β_7 and β_8 are the disaggregated parameter coefficients of public debts. The study expects the sign of the coefficients of β_5 to be positive while β_6 is expected to be negatively related to GFCF. From theoretical literature, the coefficients of public debt are expected to be positively or negatively related to GFCF.

3.5 Estimation Procedure

The study uses the Autoregressive Distributed Lag (ARDL) approach to co-integration proposed by Pesaran & Shin (1999) and Pesaran, Shin & Smith (2001) to empirically analyse the long and short-run impact of fiscal policy variables on economic growth in Nigeria. This approach presents three significant advantages over the two alternatives commonly used in the empirical literature: the single-equation technique suggested by Engle & Granger (1987) and the maximum likelihood approach proposed by Johansen (1991, 1995) which are based on a system of equations. First, the ARDL bounds testing approach allows the analysis of long-term relationships between variables in a model to be achieved without the threat of producing false regressions, irrespective of whether they are stationary at levels, $I(0)$, or stationary at first difference, $I(1)$, or mutually co-integrated. Second, the ARDL method allows for the simultaneous estimation of the short-run and long-run components, eliminating the problems associated with omitted variables and the presence of autocorrelation. Finally, the short and long-run parameters estimated using this approach are consistent in small samples. In addition, different optimal lags can be used for different variables as they enter the model, which is not applicable in the standard co-integration test. To use this approach, the study first ensure that none of the variables in the model are $I(2)$, as such data will invalidate the methodology. Then perform a bounds test to see if there is evidence of a long-run relationship between the variables and if the outcome is positive, then the study estimates a long-run levels model, as well as a separate unrestricted ECM. Following these, estimate the equation and ensure the errors of each model are serially independent and stable.

4: Results And Discussions

This empirical research aims to deliver fresh insights into the effect of fiscal policy variables on private investment based on a country-specific context or background. This segment of the paper presents the results and addresses the research findings.

4.1 Test of Stationarity of Study Variables

Prior to investigating co-integration, researchers effect unit root test on the series under study to examine the stationarity properties of time series variables. The conventional method of Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were adopted to ascertain the stationarity status of the study variables. The results of the ADF and PP unit root tests are presented in table 1.

Table 1
Augmented Dickey Fuller and Phillips-Perron Tests for Unit Root

Augmented Dickey Fuller Test				Phillips-Perron Test		
Variables	Level	1st Diff.	Remark	Level	1 st Diff.	Remark
GFCF	-2.2440 ⁿ	-4.9729 ^a	I(1)	-3.0423 ^b	-5.4526 ^a	I(1)
LOGPPT	-1.1409 ⁿ	-4.7956 ^a	I(1)	-0.7736 ⁿ	-5.8202 ^a	I(1)
LOGCIT	-0.5852 ⁿ	-6.8171 ^a	I(1)	-0.5778 ⁿ	-6.6691 ^a	I(1)
LOGPIT	-0.9376 ⁿ	-6.4892 ^a	I(1)	-0.8298 ⁿ	-6.4381 ^a	I(1)
LOGCED	-0.6526 ⁿ	-6.0569 ^a	I(1)	-0.6495 ⁿ	-6.0568 ^a	I(1)
LOGGCE	-0.9588 ⁿ	-6.3494 ^a	I(1)	-0.5908 ⁿ	-6.3394 ^a	I(1)
LOGGRE	-1.6727 ⁿ	-7.7908 ^a	I(1)	-1.2415 ⁿ	-7.6220 ^a	I(1)
LOGGDD	-2.9009 ^c	-1.0773 ⁿ	I(0)	-0.0271 ^b	-9.2562 ^a	I(0)
LOGPED	-2.6598 ^c	-4.2422 ^a	I(0)	-2.6884 ^c	-4.2422 ^a	I(1)
Notes: a, b and c denotes the rejection of the null hypothesis at 1%, 5% and 10% significance levels respectively while n denotes Not Significant.						
Source: Author's E-Views 9.5 Computation.						

From the results presented in table 1, it is manifest that the ADF and PP unit root tests produced similar results with GFCF, Log of PPT, CIT, PIT, CED, GCE and GRE achieving stationarity only after first difference while the Log of GDD and PED were stationary at levels. Based on these results, the study can correctly conclude that none of the study variables was integrated of order two. Moreover, the study variables have a mixed order of integration, that is, I(0) or I(1), which underlines the significance of using an ARDL bound testing approach to determine co-integration. Since all the study variables are a combination of I(0) and I(1) and no variable is I(2), the researcher is therefore certain that the co-integration analysis using the ARDL approach will not yield spurious regression results.

4.2: Bounds Test to Co-integration

The existence of co-integration between the regressand and regressors was assessed using the bounds testing approach. This required testing for the joint significance of lagged level variables involved in the model using the F-test at its optimal lag length since the procedure is very sensitive to the appropriate lag

length. The observations in the study are annual and sample size is 38 with 9 parameters. As a result of the small number of observations and the need to save the degrees of freedom, the study selected a maximum lag length of 2 though the ARDL approach does not require symmetry of lag length. The results obtained from the ARDL bounds testing approach and the estimated F-test are summarised in table 2.

Table 2
ARDL Bounds Test for Co-integration Results for Model (2, 1, 0, 1, 1, 0, 0, 0, 0)

Model	F-Statistics	K	Critical Values			Decision
			%	Lower Bound I(0)	Upper Bound 1(1)	
GFCF=f(LOGPPT,LOGCIT, LOGPIT, LOGCED, LOGGCE, LOGGRE, LOGGDD, LOGPED)	6.9639	8	1%	2.79	4.10	Reject H_0 and accept H_A . Series are co-integrated
			2.5%	2.48	3.70	
			5%	2.22	3.39	
			10%	1.95	3.06	

Source: Researcher's E-Views 9.5 Computation.

Table 2 indicated that the calculated F-statistic value of 6.9639 is greater than the upper bound critical value of 4.10 at one percent significance level, evidencing the fact that a long-run relationship exists between the study variables. This means that the null hypothesis of no co-integration between fiscal policy variables and private investment could be safely rejected at one percent level of significance suggesting that any short-run deviation in their relationships would return to equilibrium in the long-run. This conclusion appears consistent with the neoclassical theory which asserts that there is a long run relationship between the level of taxes and investment in an economy.

4.3: Long-run Effects of Fiscal Policy Variables on Private Investment

To determine the long-run effects of fiscal policy variables on private investment in Nigeria, the study estimated the conditional ARDL long-run model for equation 1 using the optimally determined lag length of (2, 1, 0, 1, 1, 0, 0, 0, 0). The estimated results of the long-run relationship between fiscal policy variables and private investment in Nigeria are contained in table 3.

Table 3
ARDL Long-run Estimated Results

Variables	Coefficients	Std. Error	t-Statistic	Probability
LOGPPT	-3.6828	2.0901	-2.2405	0.0355
LOGCIT	-16.8083	4.1139	-4.0858	0.0005
LOGPIT	2.7578	2.0073	1.3739	0.1833
LOGCED	10.7861	3.4267	3.1476	0.0047
LOGGCE	3.9544	1.8135	2.1805	0.0402
LOGGRE	2.3777	4.0922	0.5810	0.5671
LOGGDD	1.7052	2.0027	0.8514	0.4037
LOGPED	-4.2758	1.2517	-3.4158	0.0025
R ² = 0.9835, Adjusted R ² = 0.9738, Prob(F-Statistic) = 0.0000, DW stat = 2.1316				
Source: Author's Computation using E-Views 9.5				

From table 3, the long-run coefficient of petroleum profit tax (LOGPPT) in line with a priori expectation exhibited a negative impact on private investment and was significant at five percent level. The results suggested that a percentage point increase in petroleum profit tax holding other explanatory variables in the model unchanged, would stimulate a decrease in private investment by approximately 4.68 percent. The result is in agreement with the Laffer curve, acceleration and neo-classical theories of investment, which stated that high tax rate discourage the growth of private investment. The negative sign associated with the coefficient of LOGPPT suggest that the high petroleum profit tax rate in Nigeria reduces the profitability of oil firms, hence, reducing their ability to save and invest. Low savings, in turn, leads to low level of private investment. Furthermore, fees and rents collected by the government in the process of setting up and running businesses may serve as disincentives to invest due to the bureaucratic nature of such processes in Nigeria. Hence, there is a crowding-out effect of PPT on private investment. The result is consistent with the findings of Jeza et al (2016), Edame & Okoi (2014) and Vartia (2006) who reported that investment respond negatively to an increase in tax rate.

Based on the results in table 3, the long run coefficient of company income tax (LOGCIT) showed evidence of a negative effect on private investment that is significant at one percent level. Thus, a percentage increase in corporate income taxation holding other independent variables in the model unchanged motivated a decrease of about 16.81 percent in private investment. Individuals and firms have incentives to engage in activities that minimize their tax burden. By substituting activities taxed at a lower rate for activities taxed at a higher rate, they engage in less productive activity, leading to lower rates of investment. High corporate and multiple corporate taxation in Nigeria lowers the return of

invested capital and serve as a disincentive to the growth of private investment by increasing the cost of doing business, reducing the profit margin and global competitiveness of private investors. The result is consistent with the findings of Adejare & Akande (2017) and Jeza et al., (2016) and Vartia (2008) who reported in their studies a significant negative effect of CIT on investment in Nigeria, Ethiopia and OECD countries respectively. The long-run coefficient of Personal Income Tax (LOGPIT) demonstrated a positive effect on private investment that was statistically insignificant.

From table 4, the long run effect of indirect tax revenue proxy by customs and excise duties (LOGCED) on private investment in Nigeria was positive and statistically significant at one percent level. According to the results, a percentage increase in customs and excise duties holding other independent variables in the model constant triggered an increase in private investment of approximately 10.79 percent. The result is inconsistent with the reviewed theories of investment. Indirect taxes are normally categorised as non-distortionary taxes which do not alter the relative prices of goods and services. Increases in revenue from this source would not disrupt investment decisions of the private sector. The higher the government revenue generated from taxes, the greater the ability of government in financing social and physical infrastructure which lowers the cost of production and promote investment. The result is consistent with extant findings of Ghura & Hadji (1999), Adekunle & Aderemi (2012), Nonvida & Amegnaglo (2017) who found significant evidence of a long run positive effect of CED on investment in Nigeria and Benin respectively.

Table 4 paraded a positive impact of government capital expenditure (LOGGCE) on private investment that was significant at 5 percent level. Based on the results, a percentage point increase in capital expenditure other things remaining equal, activated an increase of about 3.95 percent in private investment. Increased government spending on infrastructural facilities reduces the overhead cost of business and cost of production thereby stimulating the growth of private investment. The result is in conformity with the findings of Gitahi et al (2013) and Omojolaibi et al (2016) who reported in their studies a significant positive impact of capital expenditure on investment. From the results in table 4, government recurrent expenditure (LOGGRE) engendered a positive impact on private investment that was not statistically significant.

Government domestic debt (LOGGDD) exerted a positive impact on private investment that was not statistically significant while public external debt (LOGPED) prompted a negative influence on private investment that was significant at one percent level. From table 4, a percentage point increase in external debt *ceteris paribus*, elicited a decrease of about 4.28 percent in private investment. The findings showed that external debt has a deleterious impact on private investment in Nigeria. This is in contradiction with the neoclassical investment theory which emphasized that debt is one of the sources of financing capital formation and if financing capital formation through this means impact positively on investment, it could promote economic growth. However, an escalating debt profile imposes a critical bottleneck on the path to economic growth. This is because it costs more to service debt and the costs may grow beyond the capacity of the debtor nation which will thereby have a negative impact on the ability of the borrowing nation to achieve the desired monetary and fiscal goals. Furthermore, government borrowing can crowd-

out private investment and reduce future output and wages which obviously threatens the welfare of residents by reducing their standard of living (Stieglitz, 2002). The result is in line with Gitahi et al. (2013), Dladla & Khobai (2018) who reported in their studies a significant negative impact of external debt on investment in Kenya and South Africa respectively.

4.4 Short-run Effects of Fiscal Policy Variables on Private Investment

Having estimated the long-run relationship between private investment and fiscal policy variables, the analysis progressed to estimate the short-run dynamics of these variables from the error correction representation of ARDL model stated in equation 1. The short-run coefficients obtained by estimating the Unrestricted Error Correction Model (UECM) from equation 1 are presented in table 4.

Table 4
Short Run Co-integration Results

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(GFCF(-1))	0.4299	0.0954	4.5070	0.0002
D(LOGPPT)	-0.0304	1.1310	-0.0268	0.9788
D(LOGCIT)	-10.1771	4.3601	-2.3341	0.0291
D(LOGPIT)	-2.3328	1.0987	-2.1232	0.0452
D(LOGCED	-1.8630	1.9689	-0.9462	0.3543
D(LOGGCE)	3.9612	1.5375	2.5764	0.0172
D(LOGGRE)	-0.9326	2.3459	-0.3975	0.6948
D(LOGGDD)	1.2997	0.9953	1.3058	0.2051
D(LOGPED)	-2.3474	1.0651	-2.2039	0.0383
Constant	7.3228	8.3143	8.0972	0.0000
CointEq(-1)	-0.7947	0.0975	-8.1516	0.0000

Co-integrating Equation = $GFCF - (3.6828*LOGPPT - 16.8083**LOGCIT + 2.7578^{NS}$

$LOGPIT + 10.7861**LOGCED + 3.9544*LOGGCE + 2.3777^{NS}LOGGRE + 1.7052^{NS} LOGGDD - 4.2758**LOGPED)$

From table 4, the coefficient of previous year investment was positive and significant at one percent. A percentage increase in one year lagged value of GCFC (GFCF(-1)), all things remaining equal, prompted

an increase of about 0.43 percent in current year GFCF. This implies that expansion in past investment will through its multiplier effects, lead to the employment of more factors of production, increase income, aggregate demand, tax base and business profits which can be used to finance current business expansion. The improved business climate will stimulate more investment. Based on the results in table 4, the effect of present value of Petroleum Profit Tax ($D(\text{LOGPPT})$) on the current level of investment was negative but statistically insignificant. Similarly, the coefficient of present rate of Company Income Tax ($D(\text{LOGCIT})$) was negatively related to the current level of private investment and significant at five percent level. This conforms to the phenomenon in the long-run indicating that high tax rates are connected with a negative influence on the level of investment. According to the results, a percentage increase in the present rate of company income tax is associated with about 10.18 percent decrease in current level of private investment.

The effect of current rate of Personal Income Tax ($D(\text{LOGPIT})$) on present level of investment was negative and significant at 5 percent level. This indicated that *ceteris paribus*, a one percent increase in present rate of PIT caused about 2.33 percent decrease in the current rate of private investment. This, in support of the long-run results indicated that individuals have a tendency of substituting more hours of work with leisure to avoid high rate of taxation. High taxes negatively affect the decision of households to supply labour because people will choose not to work as hard or not to work at all when a greater part of their earnings is taken in tax.

The coefficient of current rate of customs and excise duties ($D(\text{LOGCED})$) on present level of private investment displayed a negative relationship that was not statistically significant. The short-run coefficient of the present level of government capital expenditure ($D(\text{LOGGCE})$) was positively related to the current rate of investment and significant at 5 percent level. Based on the results, a percentage increase in the current level of capital expenditure other things remaining equal, produced about 3.96 percent increase in private investment. The coefficient of the present level of recurrent expenditure ($D(\text{LOGGRE})$) had a negative effect on the current rate of private investment that was not statistically significant. The current rate of government domestic debt ($D(\text{LOGGDD})$) exerted a positive effect on the present rate of private investment that was also not statistically significant. However, the coefficient of the current rate of external debt ($D(\text{LOGPED})$) was linked with a negative effect on the current rate of private investment that was significant at 5 percent level. The result indicated that a percentage increase in the current level of external debt *ceteris paribus* produced about 2.35 percent decrease in the current rate of private investment.

The coefficient of the error correction term which measures the speed of adjustment to restore equilibrium in the dynamic model after a shock indicated that the lagged error term coefficient ($\text{ECT}(-1)$) as expected, was negative (-0.794746) and statistically significant at one percent level. This implies that the speed of adjustment was approximately 79.47 percent per year. The negative sign and significance level of the coefficient is an indication that co-integrating relationship exists between private investment and fiscal policy variables. The size of the coefficient of the ECT denotes that all things remaining equal, about 79.47 percent of the disequilibrium in the factor market caused by previous years' shocks converges back

to long-run equilibrium in the current year. The pace of adjustment is reasonably fast and thus, any shock will take about 1.26 years to fully recover and restore the economy back to the long-run equilibrium path.

4.5 Short-Run Econometric Diagnostics Tests.

The study adopted various diagnostics tests such as the Jarque Bera, Breusch-Godfrey Serial Correlation LM and the Breusch-Pagan-Godfrey tests to check the adequacy of the estimated model. The results of the ARDL diagnostics checks are presented in table 6.

Table 6
Short-run Diagnostics Tests Results

Test	Null Hypothesis	F-Statistic	P Prob. Value
B Breusch Godfrey	N No Serial Auto-correlation	1. 0. 1454	0. 0.3381
B Breusch-Pagan-Godfrey	N No Heteroscedasticity	1. 1.5015	0. 0.1938
Ja Jarque-Bera	T There is Normal Distribution	1. 1. 6809	0. 0.4315
Source: Researcher’s E-Views 9.5 Computation.			

The traditional assumptions of the dynamic model were tested, and the respective diagnostic checking statistics failed to reject the null hypothesis, thus indicating no evidence of non-normality, serial correlation and heteroscedasticity. Similarly, the parameters stability test conducted via CUSUM and CUSUM of squares tests reported in figures 1 and 2 indicated that both graphs lie between the upper and lower critical limits at 5 percent significance level. This confirmed the fact that the long and short-run estimated parameters of the ARDL model stated in equation 1 are dynamically stable over gradual and multiple structural changes. We therefore concluded that the ARDL model was desirable and well specified as it passes both the residual and stability diagnostic tests.

5: Conclusion And Recommendations

The mission to encourage private sector led growth requires a good understanding of the interaction between government fiscal operations and private investment. Low level of private investment in Nigeria has been of concern to policymakers, especially its implication on poverty reduction and sustainable growth. This study conducted a disaggregated analysis of the nexus between fiscal policy variables and private investment in Nigeria over a 38-year time frame using the ARDL methodology. It was based on the Laffer curve and Classical-Keynesian argument of whether government fiscal operations stimulate or discourage private sector investment in Nigeria. Fiscal policy variables were disaggregated into individual revenue, expenditure and debt components in order to evaluate their relative effects on private investment. The empirical results indicated that direct tax revenue were distortionary and retarded private

sector investment while indirect taxes were estimated to be non-distortionary thereby promoting the growth of private investment. It was also discovered that a crowding-in relationship exists between capital expenditure and private investment during the review period. External debt operations showed a significant impact of discouraging the growth of private investment while the effect of domestic debt was positive but insignificant. The coefficient of co-integrating equation revealed that 79.47 percent of the short-run deviations from long run equilibrium was corrected each year.

Based on the findings, the study recommended the provision of major infrastructural facilities to reduce the cost of doing business in Nigeria, granting of tax incentives to encourage private investment in those sectors of the economy that offer lower profit margin but socially desirable, reorganization of the tax system to effectively address the problem of multiple taxation and high income taxes; and an increase in the rate of indirect taxes. Also, the government was encouraged to put in place, fiscal reforms that would help in better management of borrowed funds taking into account not only the country's debt-servicing capacity but also its structural economic problems and investment needs in addition to expending borrowed funds on productive and self-liquidating investments with significant crowding-in effect on private investment. Political and macroeconomic stability that gives investors a certain degree of predictability to be able to assess risks and determine what to invest in and an enabling environment that guarantee security of lives, property and investment is also required to stimulate private investment.

Declarations

Authors Declaration:

The authors of this paper wish to declare as follows:

Availability of Data:

the study uses secondary data sources obtained publicly from the Central Bank of Nigeria, <http://www.centbank.gov.ng.org>, Debt Management Office, <https://www.dmo.gov.ng> and World Development Indicators statistical database. <https://data.worldbank.org/indicator>

Competing Interests:

Abdulkarim Yusuf declares that he has no conflict of interest. Saidatulakmal Mohd. declares she has no conflict of interest and the paper has not been previously published or presently under review elsewhere.

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Writing: Original Draft Preparation: Abdulkarim Yusuf.

Writing: Review and Editing: Abdulkarim Yusuf.

Supervision: Associate Professor, Dr. Saidatulakmal Mohd.

Both authors contributed to the study conception and design. The first draft was written by Abdulkarim Yusuf. Both authors commented on previous versions of the manuscript, read and approved the final draft of this manuscript.

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Authors' Information:

Same as in front page.

Compliance with Ethical Standards:

this article does not contain any studies with human participants or animals performed by any of the authors. The study uses secondary data sources obtained publicly from the Central Bank of Nigeria, Debt Management Office and World Development Indicators statistical database and is not sensitive in any way to any vulnerable group(s).

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Figures

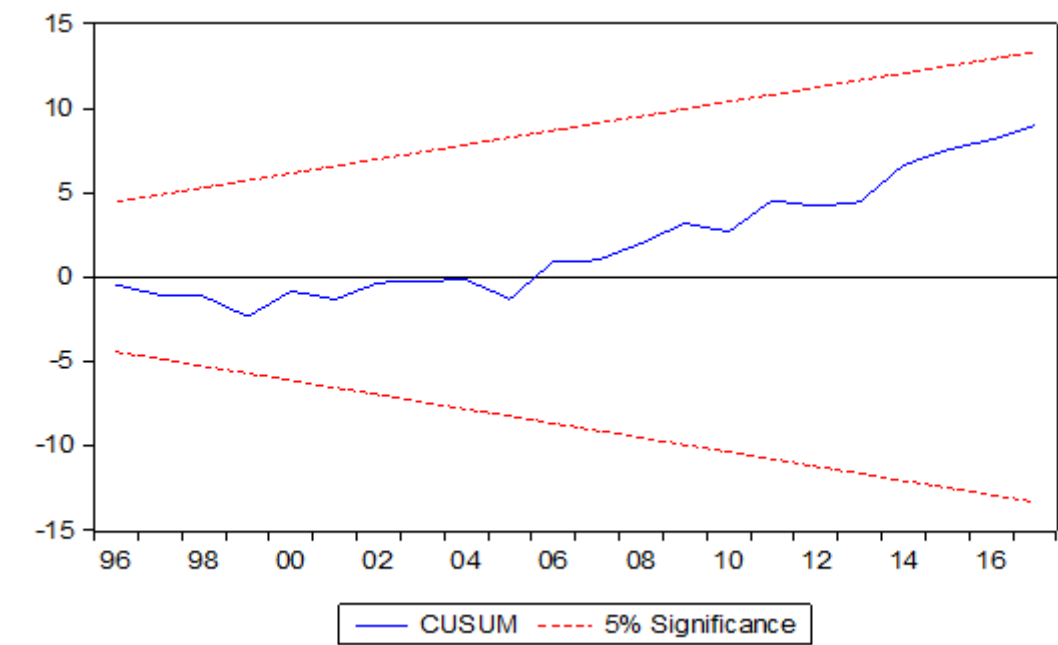


Figure 1

Plot of CUSUM Graph

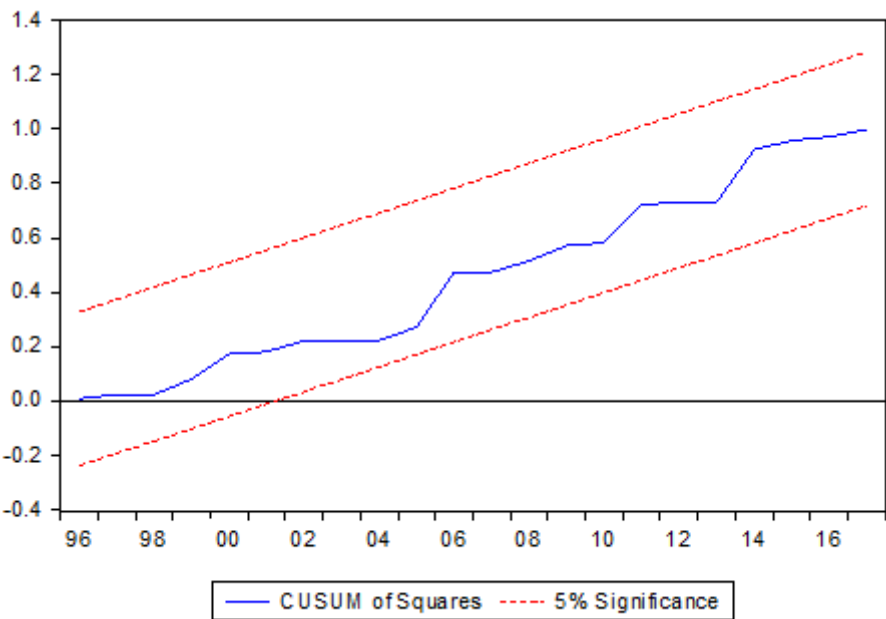


Figure 2

Plot of CUSUM of squares graph