# Public Spending and Private Investment: Testing the Crowding-Out Hypothesis in Nigeria (1981–2020)

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# Public Spending and Private Investment: Testing the Crowding-Out Hypothesis in Nigeria (1981 – 2020)

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## ABSTRACT

*This study verified the crowding-out hypothesis in the Nigerian economy for the period 1981 to 2020. This was done in a bid to refute or otherwise the age-old claim in economic literature that government budget deficits trigger both aggregate demand and interest rates, thereby crowding out private investment. The analysis was done with the aid of the ARDL technique, given the fact that there was an admixture of stationary and nonstationary series in the model, as found out in the ADF unit root test. This study confirms the presence of the crowding-out effect in both the short run and the long run. Irrespective of the model considered, whether in the short run or long run, GDP has been a strong fundamental driver of private investment in Nigeria. Both the short-run and long-run estimates are statistically significant at the 1% level, suggesting that investment typically exceeds savings when income grows in Nigeria. In other words, private investment in Nigeria is income-driven. This result is in line with Duesenberry's financial theory of investment. Although a positive relationship between government capital expenditure and private investment in Nigeria was confirmed in both the short run and the long run, capital expenditure is not yet a significant determinant of private investment growth. This suggests that Nigeria has not yet achieved a breakthrough in infrastructure development, particularly in critical sectors such as transportation and communication, which are essential for attracting private investment. Furthermore, the findings reiterate that most private investments in Nigeria are income-induced rather than autonomous. Consequently, the government is strongly advised to provide more incentives to indigenous manufacturers and businesses, invest heavily in infrastructure to secure Nigeria's economic future, and create a more conducive macroeconomic environment for businesses. In addition, government spending should be directed towards stimulating the productive sectors of the economy, rather than supporting consumptive activities.*

Keywords: Budget deficit, private investment, interest rate, government expenditure, ARDL Model

JEL Classification: H62, E22, E4, H5, C500

## INTRODUCTION

The impact of government domestic borrowing on the private sector credit has been a subject of great interest to researchers in finance. Most conventional arguments in economics favour unbalancing the fiscal budget given its envisaged expansionary potential to stimulate economic growth. Government expenditures have witnessed tremendous expansion over the years, especially after the Great Depression of the 1930s in the United States of America which herald the birth of Keynes revolutions with his general theory of employment, interest and money in 1936. Following the theory's efficacy in ameliorating the depression in particular and offering a realistic alternative to classical theorists in general, many modern development theorists have further propagated Keynes postulation to prescribe the unbalancing of government budgets, owing to its acclaimed expansionary effects on employment, national output and income. According to Keynes (1936), in an economy experiencing deficiency in aggregate demand as well as in less developed countries where there are dearth of infrastructure, low saving and capital formation, underdeveloped domestic productive capacity and lack of private initiatives, expansion in government expenditure in the form of budget deficit has the capacity to stimulate aggregate demand and economic growth in such economies, through the workings of the government consumption multiplier. However, despite the envisaged expansionary objectives of such fiscal policy, there exists possibility that it could produce some macroeconomic undesirables like inflationary pressure, increases in interest rate and/or crowding-out of private investment, if undertaken.

As noted by Udaba (2002) financing government expenditures through borrowing both domestic and foreign could lead to accumulated debt burden of both principal and interest. Secondly, financing expenditures through public borrowing could also lead to the crowding-out of private investment spending and interest sensitive consumer spending, thereby inhibiting the multiplier effect of the initial public expenditure and by extension, contracts economic growth. This possibility exists because, if government continuously borrow especially from the domestic market finance its expenditures, it will be competing with private investors for available loanable funds. This added demand for funds will eventually drive the equilibrium interest rate upward which decreases investment as both are inversely related.

Following this background, this study seeks to verify the crowding-out hypothesis in the Nigerian economy for the period 1981 to 2020. This was done in a bid to refute or otherwise the age-long assertion in economic literature, that government budget deficit triggers both aggregate demand and interest rates thereby leading to crowding-out scenario on private investment. Specifically, the paper focuses on answering the following research questions: (i) is the crowding-out hypothesis valid in the Nigerian economy? (2) What effect does government borrowing have on private investment? (3) What effect do other control variables have on private investment? The paper is structured as follows: Section two discusses literature review; Section three discusses the methodology; section four contains presentation of results and discussion; and section five concludes the study.

## LITERATURE REVIEW

### Theoretical Issues

The impact of budget deficit on economic growth like other economic phenomenon has been a source of debate for policy makers. The issue of whether increased government expenditure would lead to higher economic growth is a question of debate between the Keynesians, the Classicalists and the Ricardian schools of thought. Most theoretical literature supports the view that government expenditure has a positive effect on economic growth, although some argue that budget deficits cause a crowding-out effect, while others believe that budget deficits have no effect on economic growth.

### Keynesian theory

In the pre-Keynesian era, a tradition of balanced budget which has prevailed for years helped in guiding on the spending tendencies of government invariably, keeping expenditures within the revenue limits imposed by the size of collectible taxes. This standard pattern of behavior ceased among many governments following the American depression of the 1930s. During that period, the United States and many other countries experienced massive unemployment and greatly reduced incomes. In 1936 precisely, the British economist, in his book, "The General Theory of Employment, Interest and Money", proposed a new theory to analyze the economy. Keynes proposed that low aggregate demand was responsible for the low income and high unemployment that characterized economic downturn. He contributed the problems of under-spending or under consumption as underlying the prevailing unemployment problem then. If the spending level and

consequently the demand level should increase, employers of labour will acquire more workers thereby reducing the level of unemployment.

Keynesians emphasize the expansionary or crowding-in effects of increase in government expenditure on the economy. In other words, increase in government expenditure has a positive influence on economic productivity by increasing a country's domestic production which in turn encourages private investment. Increasing government expenditure will increase the money in circulation, more people will be employed and there will be increase in aggregate demand. The firms will have to increase production to meet the increase in aggregate demand, for them to increase production, they will hire more workers and increase the salaries of existing employees so that they can work extra hours. This will reduce unemployment in the economy and boost economic activities leading to an increase in the country's gross domestic product.

Keynesian economists claim that, premising from the assumption that the economy is not always at full employment, budget deficits increase aggregate demand, and consequently private investment increases (crowding-in). The primary reason for this is the increase in national production resulting from the increase in public spending. Increasing national production brings about more optimism in expectations of private investors and accordingly their willingness to invest increases. Secondly, government spending in infrastructures of such areas as transportation, communication, and so on increases the profitability of private investments.

**Ricardian equivalence hypothesis**

Another controversial school of thought on budget deficit is the Ricardian equivalence hypothesis. Ricardian economists argue that although a debt financed tax cut would increase disposable income, it would also imply that at some point in the future, the government must raise taxes to pay off the debt and accumulated interest as a result, the tax cut would have no effect what so ever on aggregate demand. According to Elif and Gul (2001), this hypothesis suggests that the equilibrium levels of current account, interest rates, investment and consumption will not be affected by the changes in the level of budget deficit. This assertion can be regarded as an extension of the Permanent Income Life-Cycle Hypothesis including government expenditure, taxes and debt which indicate a change in the level of budget deficit will not change the lifetime budget constraint and real wealth of the consumer. As a consequence of inter temporal consumption behaviour, according to the Ricardian equivalence proposition, temporary changes in the level of government

expenditure and marginal tax rates are much more important than the ways of financing it. Furthermore, the equivalence theory as articulated by the classical economist, David Ricardo in 1817, suggests that government budget deficits should not alter capital formation and economic growth or the level of aggregate demand including demand for imports due to the fact that farsighted individuals fully capitalize the implied future taxes associated with budget deficits.

According to Ricardian equivalence, the economic agents regard present tax cuts as future tax burden because the agents are assumed to be foresighted. The agents realize that present value of taxes depends on real government spending not on the timing of taxes. Therefore, an increase in debt cannot stimulate the aggregate demand, and as a result, the increase in debt has no real effects. The Keynesian approach is based on the assumption that the agents decide their consumptions on current income. But from a Ricardian assertion, when the agents are forward looking and are fully aware of the government's intertemporal budget constraint, they will anticipate that tax cuts today will result in higher taxes being imposed on their future generation. Hence, the agents who take care of their descendants' utilities as well as their own will not increase their consumption based on increased current disposable income due to today's tax cuts. Proponents of this view point out that while tax cuts have the effect of reducing public saving and enlarging the budget deficit, they increase private savings by an amount equal to the expected increase in the tax burden in the future years (Nozar and Loretta, 2006). With the assumption of free access to credit market, the agents decide their consumption based on permanent income which is not affected by the timing of taxes. Thus, there is Ricardian equivalence between taxes and debt. The Ricardian view proposes that the substitution of budget deficit for current taxes or an alternative temporal arrangement has an equal effect on aggregate demand. Thus, the two are equivalent.

A decrease in taxation by the government incurs a budget deficit with a future tax implication. Rational consumers recognize that these future taxes have a present value equal to the incurred debt. They therefore see through the intertemporal veil, saving additional disposable income to pay the future taxes rather than raising their consumption, an action equivalent to paying current taxes. The rise in private saving exactly offsets the fall in public saving and therefore aggregate demand and economic growth remain unchanged. The theory is based on relatively strong assumptions such as rational and forward looking individuals, lump-sum taxes, perfect capital

market and infinite lives of consumers all of which may render the Ricardian equivalence practical relevance, at least in its perfect form, questionable.

Ricardian equivalence implies debt financed fiscal policy would not raise aggregate demand, therefore having no short run effects on employment and output. Summarily, government debt is not perceived as net wealth by rational households. If government should increase the expenditure, the aggregate demand will remain unchanged because the increase in government expenditure will be matched by a proportionate increase in individuals' savings. Since the increase in private savings equals the decrease in government savings, there will be no change in wealth unless government spending changes and the interest rate and private consumption should remain unperturbed so long as change in private saving equal to change in government savings. Perfect Ricardian equivalence implies that a reduction in government savings due to tax cuts is fully offset by higher private savings, so the individual's consumption pattern is not affected.

**Empirical Review**

The question of relationship between budget deficit and private investment and ultimately economic growth started to draw researchers' attention in the 1980's. The crowding-out hypothesis asserts that an increase in budget deficit will have a negative impact on private investment. But results of testing this hypothesis turned out dissimilar for different countries and different econometric techniques. Many authors have proved the existence of such hypothesis;

Dreger and Reimers (2016) explored the long-run relationship between public and private investment in the euro area. In contrast to previous studies, a stock-flow approach was applied to control for the different orders of integration between the stock and flow variables as well as panel econometric techniques allowing for international spillovers. Overall, the researchers noted that lack of public investment may have restricted private investment and GDP growth in the euro area. Their results have strong implications for the future direction of fiscal austerity programs to combat the euro area debt crisis.

Ferria and Voia (2015) noted for the economy of Canada that government expenditure between 1870 and 2011 showed an inverted U-shaped relationship with private output. The findings revealed that while government size complements the growth of the Canadian private investment in its early stages, recent experience is more consistent with the hypothesis that increases in government size have decreased rather than increased private per capita output.

In Nigeria, Dada (2013) observed that government expenditure initiates private consumption and output in the long-run. Government expenditure on education, health, and social security crowded in private consumption, while other components such as government spending on administration, construction, agriculture, transport and communication crowded out private consumption. The short-run result revealed that the variables used do not return to equilibrium after a short-run deviation in the private consumption equation.

Akpokodje (1998) using a time series data and standard ordinary least squares (OLS) techniques investigated the impact of fiscal policy on economic growth and private investment. The long run regression results indicated that a fiscal policy weakened by fiscal deficit has a strong and significant adverse impact on private investment in the long run. The result indicates that a percentage increase in fiscal deficit is capable of contracting private investment by as much as 61%. This negative impact confirms the crowding-out effect of government's fiscal deficit on private investment in Nigeria. Using the ordinary least square method (OLS).

Isah (2012) examined the impact of budget deficit on private investment observed that prolong deficit financing has an overall negative impact on the economy by crowding out private investment in Nigeria. The findings revealed a negative relationship between deficit financing and investment in the period under review, that is, deficit financing in Nigeria crowds out private investment. The study recommended that government should redirect its fiscal policy that would favor the private investor by discouraging high government expenditure and maintaining low fiscal deficit.

Asogwa and Okeke (2013) evaluated the relationship between private investment and budget deficits by adopting an analytical framework that employed the ordinary least squares (OLS) and Granger Causality test. The analysis confirms that budget deficits crowds out private investments and that private investments granger cause budget deficit with feedback. Following the findings, it was recommended that stakeholders should reduce recurrent expenditure and increase its capital expenditure in order to encourage and make conducive environment for private investment to thrive which will ensure economic growth.

Horvath (2009) in his study of the effect of government spending shocks on consumption under an optimal stabilization framework, gave an interesting insight about private consumption. He described private consumption as the the largest component of aggregate demand and also assumed

to be a principal determinant of agents' welfare. Economic theory has yet to come up with a general guidance regarding the dynamic effects and welfare implications of shocks to public spending. He further revealed in his study that an increase in private consumption following a positive innovation in government spending would require an undue degree of volatility in the economy, which would hurt agents through lower welfare overtime.

Odior and Banuso (2011) explore the household welfare effect of macroeconomic volatility on private consumption expenditure in Nigeria over the period 1980-2008 using a dynamic macroeconometric stochastic model. Their results revealed that personal consumption expenditure respond more to the structural innovation in inflation than other endogenous variables, and also that inflation innovations play a larger role in explaining forecast error variance in the long run than they do in the short run and that this will generate negative net effects on welfare.

Fabiosa and Jensen (2002) while using the Indonesian economy explained that macroeconomic shock will have impact on the level on the level of household welfare via low private consumption expenditure and inflation may also affect measure of consumer welfare if income of low income families responds slowly to increases in price level. Lavi and Strawczynski (2005) examined the impact of fiscal policy on consumption in Israel with emphases on fiscal expectation approach with the use of Engel and Granger Causality test and the study indicates an increase in financing deficit to private consumption while indirect tax on wages has a negative effect on household consumption and also a substitutability relationship between government consumption and private or household consumption.

Olomola and Olagunju (2004) examined the linkage between fiscal deficit and private consumption spending in Nigeria during the period of 1970-2001 using vector error correction approach. The result shows that fiscal deficit exert great influence through substitution effect between private and public consumption and indirect influence on other macroeconomic variables employed.

Drakos (2001) explored the long run relationship between government domestic borrowing and private savings for a small EU country Greece. The study found that contrary to the Ricardian Equivalence hypothesis, households, to some extent, perceive government bonds as net wealth and consequently stimulate their private consumption. Bhattacharya and Mukherjee (2010)

investigated the relationship between private expenditure, government expenditure and debt in OECD economies. The results from the study indicate that the relationship between private expenditure and government debt become negative during periods of high government indebtedness specifically for Australia, Belgium, Canada and Spain.

There were a lot of limitations associated with the literatures of previous studies both the ones that were analysed above and the ones that were not. The works by previous researchers are wonderful, they tried to determine what kind of relationship exists between budget deficit and private investment. Most of the studies reviewed were cross-country based analysis and thus produced mixed results which gives credence to country specific study because of country peculiarities. Methodologies, such as, Johansen cointegration approach, Vector Error Correction Model (VECM), Structural Vector Autoregression (SVAR) or, simply, VAR, Ordinary Least Squares (OLS), Granger causality and correlation analysis have been employed in the previous studies; none has ever made use of the framework of Autoregressive Distributed Lag (ARDL). In all of these, it made it difficult in having a general consensus as to the exact relationship between both macroeconomic variables that is budget deficit and private investment especially in emerging economies such as Nigeria. To overcome this problem, this study focuses on Nigeria to ascertain the exact relationship between budget deficits and private investment in Nigeria and to test the validity of the crowding out hypothesis using appropriate regression methods.

## THEORETICAL FRAMEWORK

The Accelerator Theory of Investment is adopted as the theoretical framework for this study. According to the accelerator theory, an increase in consumption or income leads to a proportionally larger increase in investment. The theory posits a direct relationship between income (or total output) and investment expenditure. The underlying rationale is that an increase in income stimulates higher consumption (demand), necessitating greater production of goods and services. Consequently, firms are prompted to undertake additional investment, particularly when existing capital stock is fully utilized. Investment that arises as a result of changes in income or consumption is referred to as induced investment. A specific level of capital stock is required to produce a given level of output, and this relationship can be formally expressed as:

$$Kt = vYt \quad (1)$$

Where $K$ denotes the capital stock; $Y$ represents output or income; $v$ is capital-output ratio ($K/Y$) and $t$ refers to the time period. Equation (1) illustrates that capital stock (or net induced investment) is an increasing function of aggregate output or income under the assumption that the capital-output ratio (v) remains constant. This assumption implies that output and capital stock grows at the same rate. Accordingly, when income or output is $Yt$, the required capital stock is given by $Kt = vYt$; similarly, when income or output is $Yt-1$, the capital stock is expressed as:

$$Kt-1 = vYt-1 \quad (2)$$

Equation (2) implies that the previous level of capital stock is an increasing function of the previous level of output or income. In other words, an increase in output or income during the preceding period will induce a corresponding increase in investment expenditure within that period. The change in capital stock between the previous and current periods can be derived by subtracting Equation (2) from Equation (1), yielding:

$$Kt - Kt-1 = (Yt - Yt-1) \quad (3)$$

$Kt - Kt-1$ signifies the increase in capital stock (or new investment) in the current year thus, equation [iv] becomes:

$$It = (Yt - Yt-1) \quad (4)$$

Equation (4) indicates that the increase or decrease in current income or output ($Yt$) over the previous period's income output ($Yt-1$) will result in an increase or decrease in investment that is $v$ times the change in income. Thus, the capital-output ratio ($v$) function as the accelerator, representing the degree of responsiveness of investment to changes in income. For instance, if $v$ = 5, investment spending will increase five times as much as the increase in income or output.

## METHODOLOGY

### Model Specification and estimation technique

This study adopted accelerator investment model as baseline model and further modified it to allow for more important variables such as Credit to Private Sector (CPS), Government Capital Expenditure (GCEXP), Gross Capital Formation (GCF, a proxy for domestic investment environment), Gross Domestic Product (GDP), and Lending interest rate (LIR). Hence, equation (4) above is thus modified as follows:

$$CPS_t = \beta_0 + \beta_1 LGDP_t + \beta_2 GCEXP_t + \beta_3 LIR_t + \beta_4 GCF_t + \varepsilon_{1t} \quad (5)$$

The autoregressive distributed lag versions of eq. (5) is as follows as developed by Shin, Yu and Greenwood-Nimmo (2014):

$$\Delta CPS_t = \beta_1 CPS_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 GCEXP_{t-1} + \beta_4 LIR_{t-1} + \beta_5 GCF_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta CPS_{t-i} + \sum_{j=0}^{q_1} \gamma_j \Delta LGDP_{t-j} + \sum_{j=0}^{q_2} \delta_j \Delta GCEXP_{t-j} + \sum_{j=0}^{q_3} \pi_j \Delta LIR_{t-j} + \sum_{j=0}^{q_4} \psi_j \Delta GCF_{t-j} + \varepsilon_{4t} \quad (6)$$

**The error correction representation is derived as follows**

$$\Delta CPS_t = \beta_1 (CPS_{t-1} - [\beta_{\frac{2}{\beta_1}} LGDP_{t-1} - \beta_{\frac{3}{\beta_1}} GCEXP_{t-1} - \beta_{\frac{4}{\beta_1}} LIR_{t-1} - \beta_{\frac{5}{\beta_1}} GCF_{t-1}]) + \sum_{i=1}^{p} \alpha_i \Delta CPS_{t-i} + \sum_{j=0}^{q_1} \gamma_j \Delta LGDP_{t-j} + \sum_{j=0}^{q_2} \delta_j \Delta GCEXP_{t-j} + \sum_{j=0}^{q_3} \pi_j \Delta LIR_{t-j} + \sum_{j=0}^{q_4} \psi_j \Delta GCF_{t-j} + \varepsilon_{4t} \quad (7)$$

By letting,

ECT = $CPS_{t-1} - \mu_1 LGDP_{t-1} - \mu_2 GCEXP_{t-1} - \mu_3 LIR_{t-1} - \mu_4 GCF_{t-1}$

Where,

$$\mu_1 = -\beta_{\frac{2}{\beta_1}},\ \mu_2 = -\beta_{\frac{3}{\beta_1}},\ \mu_3 = -\beta_{\frac{4}{\beta_1}},\ \mu_4 = -\beta_{\frac{5}{\beta_1}} \quad (8)$$

Equation (6) thus becomes

$$\Delta CPS_t = \beta_1 \text{ECT} + \sum_{i=1}^{p} \alpha_i \Delta CPS_{t-i} + \sum_{j=0}^{q_1} \gamma_j \Delta LGDP_{t-j} + \sum_{j=0}^{q_2} \delta_j \Delta GCEXP_{t-j} + \sum_{j=0}^{q_3} \pi_j \Delta LIR_{t-j} + \sum_{j=0}^{q_4} \psi_j \Delta GCF_{t-j} + \varepsilon_{4t} \quad (9)$$

Where

ECT is the error correction term with its corresponding coefficient $\beta_1$which is the speed of adjustment. It measures the speed at which the private investment adjusts from its short-run fluctuations to its long-run equilibrium value. It is said to be negative and statistically significant at any of the conventional level. CPS is the credit to private sector, LGDP is the natural log of gross domestic product, GCEXP is the government capital expenditure, LIR is the lending interest rate, while GCF is gross capital formation, $\alpha_i, \gamma_j, \delta_j, \pi_j, \psi_j$ are short run parameters while $\mu_1, \mu_2, \mu_3, \mu_4$ are long run parameters, $p$ is the maximum lag length for the dependent variable whereas $qs$ are the maximum lag lengths for the explanatory variables, $\varepsilon$ is the error term, with "t " signifying the time dimension, L is logarithmic operator and $\Delta$ equals first difference operator.

**A priori Expectations**

Based on the ARDL model, that is, eq. (9), we have the following restrictions on the regression coefficients

$\alpha_i, \gamma_{j>0}$; $\delta_j$, $\psi_j >$ or $< 0$; $\pi_j < 0$ and

$\mu_1 > 0$; $\mu_3 < 0$; $\mu_2, \mu_4 >$ or $< 0$.

## SCOPE OF THE STUDY

The study collected annual data on the variables to be used covering the period starting from 1981 to 2020 from sources such as Central Bank of Nigeria (CBN) and World Development Indicator (WDI). The variables captured in the study are best described in the table below:

**Table 1**: Data Description and Sources

| Variable | Description | Source |
|---|---|---|
| CPS | Credit to Private Sector | Central Bank of Nigeria (CBN, 2022) |
| LDGP | Natural log of gross domestic product | Central Bank of Nigeria (CBN, 2022) |
| GCEXP | Government Capital Expenditure | Central Bank of Nigeria (CBN, 2022) |
| LIR | Lending interest rate | World Development Indicator (WDI, 2022) |
| GCF | Gross Capital Formation (a proxy for domestic investment environment) | World Development Indicator (WDI, 2022) |

***Source**: Author's Compilation, 2022*

## PRESENTATION OF RESULTS AND DISCUSSION

**Result of Unit Root Test**

Table 2 below shows the result of the augmented Dickey-Fuller (ADF) unit root test on the five variables employed in the study. It can be observed that while both credit to private sector (CPS) and gross capital formation (GCF) are stationary at levels, other variables including the natural log

of gross domestic product (LGDP), government capital expenditure (GCEXP) and lending interest rate (LIR) became stationary after first differencing. However, note that only test regressions that are close to rejecting the null hypothesis of nonstationarity are reported. The combination of stationary and nonstationary variables as employed makes the consideration of ARDL Bounds test for cointegration plausible.

**Table 2**: Result of ADF Unit Root Test

| Variables | Levels | First differences | (d) |
|---|---|---|---|
| CPS | -5.333***[c] | ----------† | (0) |
| LGDP | -0.0285[a] | -3.209**[b] | (1) |
| GCEXP | -2.878[a] | -9.185***[c] | (1) |
| LIR | -2.278[a] | -5.412***[c] | (1) |
| GCF | -3.621***[c] | ----------† | (0) |

**Note**: ***, **, * indicate the rejection of the null hypothesis of a unit root at 1%, 5% and 10%, respectively; I(d) is the order of integration and it refers to the number of differencing required for a series to become stationary; †implies that a series that is stationary at levels does not require its first difference being reported; Superscripts a, b and c denote model with intercept and trend, and model with intercept only and model with none, respectively.
***Source**: Author's Computation, 2022*

**The Bounds Cointegration Test Results**

Table 3 shows the result of the ARDL Bounds test for cointegration. As results indicated; since the computed F-stat so obtained falls between lower bound I (0) and upper bound I (1), then both short run and long run models will be estimated. It can thus be concluded that there exists long-run relationship in the model.

**Table 3: Result of ARDL Bounds Test for Cointegration**

| F-stat | 3.844848 | |
|---|---|---|
| Critical Values | | |
| Significance levels | I0 Bound | I1 Bound |
| 10% | 3.03 | 4.06 |
| 5% | 3.47 | 4.57 |
| 2.5% | 3.89 | 5.07 |
| 1% | 4.4 | 5.72 |

***Source**: Author's Computation, 2022*

**Discussion of Regression Results**

**Estimated long run coefficient using ARDL approach**

Over the long term, government fiscal policy crowded out private investment as reflected in the sign and magnitude of the interest rate and gross capital formation, even though lending rate is insignificant gross capital is highly significant implying that government spends at the expense of private investment. This is also a way of saying that liquidity provision to the private sector is being undermined by the government itself. Similarly, the findings reveal that the only significant driver of private investment in Nigeria over the long term is gross domestic product, implying that investment overshoots saving when income grows in line with Duesenberry's financial theory of investment. This is as evident in the impact coefficient of GDP as for every 1% increase in GDP, private investment increases on average by 0.7 percentage point, keeping other variables constant.

**Table 4: Result of Long Run Estimation**

| | Dependent Variable | LOG(CPS) |
|---|---|---|
| LGDP | 0.670378***(0.164536) | |
| LOG(LIR) | -0.270333(0.192094) | |
| LOG(GCEXP) | 0.078145(0.123729) | |
| LOG(GCF) | -0.80743***(0.305725) | |
| C | 2.576052(1.650477) | |
| @TREND | 0.076106***(0.033511) | |

***, **, * indicate the statistical significance of coefficients at 1%, 5% and 10% respectively; the values in parentheses are the standard errors.

However, in the short run, the findings reveal that expectations about private investment in Nigeria are adaptive as previous private investment feed into the present; the autoregressive coefficient is thus statistically significant at 1% conventional level. Contrary to expectations, in the short run, the period is not long enough for interest rate channel to create crowding-out effect on private investment as private investment increases significantly despite higher interest rate. Nonetheless, public investment exceeds private investment as reflected in gross capital formation which outperforms interest rate impact coefficient. Consequently, it is safe to conclude that crowding-out effect also prevails in the short run.

Irrespective of model considered whether short run or long run, GDP has been a very good fundamental driving private investment in Nigeria. Both short run and long run estimates are statistically significant at the 1% significance level, implying that investment usually exceeds

saving when income grows in Nigeria. Government is thereby advised to provide more incentives to indigenous manufacturers and businesses so that they can be encouraged; invest in infrastructures and ensure that macroeconomic environments are conducive for businesses. Moreover, government spending should be tailored towards stimulating the productive segments of the economy and do away with consumptive tendencies. However, despite that positive relation was confirmed between government capital expenditure and private investment in Nigeria both in the short run and the long run, capital expenditure in Nigeria is not yet a significant determinant of private investment growth in Nigeria, implying that there is no yet a breakthrough in infrastructure development stance of Nigerian economy especially in the area of, for instance, transport, communication etc. towards private investments.

Moreover, almost 99 % total variation in the model is well explained by the combined efforts of the variables employed as reflected in the adjusted R of 0.998. The overall model is also significant at 1% level of significance. Lastly, post-estimation/diagnostic tests, including linearity, normality, serial correlation, and heteroscedasticity were conducted on the modes. Though the models generally suffer from non-normality of the residuals, the results of the other three tests (linearity, serial correlation, and heteroscedaticity tests) confirmed the adequacy of the models for policy prescription and the regression estimates are considered best linear unbiased estimators (BLUE).

**Table 5: Estimates from the Error Correction Mechanism**

| | Dependent Variable | LOG(CPS) |
|---|---|---|
| DLOG(CPS(-1)) | 0.444569***(0.155783) | |
| D(LGDP) | 0.350370***(0.098633) | |
| DLOG(LIR) | 0.268696*(0.157838) | |
| DLOG(GCEXP) | 0.040842(0.063989) | |
| DLOG(GCF) | -0.422002**(0.173269) | |
| D(@TREND()) | 0.039777*(0.022895) | |
| CointEq(-1) | -0.522646***(0.124379) | |
| Cointeq = LOG(CPS) - (0.6704*LGDP -0.2703*LOG(LIR) + 0.0781 *LOG(GCEXP) -0.8074*LOG(GCF) + 2.5761 + 0.0761*@TREND ) | | |
| Adj. $R^2$ | | 0.998 |
| F-statistic | | 2306.701 [0.00000] |
| Breusch-Pagan-Godfrey heteroscedasticity test | | 0.880219 [0.5449] |
| Jarque-Bera normality test | | 25.83186[0.000002] |
| Ramsey RESET linearity test | | 4.210249 [0.0500] |
| Breusch-Godfrey serial correlation LM test | | 1.050904 [0.3640] |

***, **, * indicate the statistical significance of coefficients at 1%, 5% and 10% respectively; the values in parentheses and block bracket are, respectively, the standard errors and the probability value

## SUMMARY, CONCLUSION AND POLICY SUGGESTION

This study verified the crowding-out hypothesis in the Nigerian economy for the periods 1981 to 2020. This was done in a bid to refute or otherwise the age-long assertion in economic literature, that government budget deficit triggers both aggregate demand and interest rates thereby leading to crowding-out scenario on private investment. The analysis was done with the aid of ARDL technique given the fact that there were admixture of stationary and nonstationary series in the model as found out in the ADF unit root test. Also, the results of Bounds test cointegration test confirmed the existence of both short run and long run cases. This study confirms the presence of the crowding-out effect in both the short run and the long run.

Irrespective of the model considered, whether in the short run or long run, GDP has been a strong fundamental driver of private investment in Nigeria. Both the short-run and long-run estimates are statistically significant at the 1% level, suggesting that investment typically exceeds savings when income grows in Nigeria. Therefore, the government is advised to provide more incentives to indigenous manufacturers and businesses, and to ensure that the macroeconomic environment remains conducive for business activities. In addition, government spending should be directed towards stimulating the productive sectors of the economy rather than fueling consumptive activities. Although a positive relationship between government capital expenditure and private investment was confirmed in both the short run and the long run, capital expenditure is not yet a significant determinant of private investment growth in Nigeria. This implies that Nigeria has not yet achieved a breakthrough in infrastructure development, particularly in sectors such as transportation and communication, which are crucial for fostering private investment.

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