

## Government Borrowing and Private Investment in Nigeria

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### Abstract

*This study sought to examine the effects of government borrowing on private investment in Nigeria using secondary data from 1986 to 2023. An autoregressive distributed lag (ARDL) model was applied to investigate the short-run and long-run effects of government borrowing on private investment. The findings revealed that, in Nigeria, for the period under investigation, government borrowing had a significant negative effect on private investment in the short run and a positive/significant effect on private investment in the long run. Based on these results, the study recommends that the government should direct borrowed funds towards projects that have immediate positive spillovers for the private sector, such as grants or subsidies for small businesses, to mitigate the crowding-out effect. The government should also prioritise investment in infrastructure such as good transportation networks and reliable power supply that directly reduce the costs of doing business. These will stimulate private investment in the Nigerian economy.*

**Keywords:** government borrowing, private investment, infrastructure

### 1.0 Introduction

In modern economies, investment is a viable avenue to economic growth. Nations with high rates of investment experience rapid economic growth, while countries with low investment rates experience slow or moderate growth (Epor et al., 2023)

Developing countries desire rapid economic growth, but lack the needed funds for huge investments; thus, borrowing is one of the levers to meet growth funding requirements. Government borrowing can have both positive and negative effects. On the positive side, it allows governments to finance infrastructure development, promote economic growth, and address other crucial social needs. However, excessive and poorly managed debt may lead to reduced investment, debt overhang, higher borrowing costs, and crowding out private investment, which can hinder long-term economic growth.

Government borrowing, primarily through the issuance of bonds and loans, is often viewed as a mechanism to finance investment and, by extension, stimulate economic growth. However, the effects of this borrowing on private investment can vary based on several factors, including the

economic environment, interest rates, and the overall efficiency of public expenditure. One of the primary concerns regarding government borrowing is the potential for crowding out private investment. When the government borrows heavily, it can lead to higher interest rates as the demand for loanable funds becomes competitive. Higher interest rates can make borrowing more expensive for private investors, potentially discouraging them from pursuing new investments (Obi & Nwosu, 2018). This phenomenon is particularly relevant in Nigeria, where the financial market is relatively shallow and the government often competes with the private sector for limited capital.

Apart from government borrowing to finance a deficit budget (deficit financing or deficit spending), the government also borrows to refinance past debts (Akpakpan, 1999). Excessive government borrowing most likely results in debt overhang, which can lead to under-investment. Generally, the direction of government spending primarily determines whether the public debt will lead to economic growth or not. For instance, borrowing to service past debts and borrowing for recurrent expenditure may not stimulate the economy. In this case, an increase in public debt may have an asymmetric effect on economic growth and investment. On the other hand, borrowing to carry out development projects increases capital expenditure. And investment in the real sector would lead to economic growth. Unfortunately, many developing countries borrow to service past debts and for recurrent expenditure, which is why their debt burden keeps increasing, investment keeps dwindling, unemployment rises, national output falls, and most of the residents are trapped in poverty.

Theoretically, the relationship between government borrowing and investment can be analysed through various economic theories, including the crowding-out effect, Keynesian economic theory, and the Ricardian equivalence theorem. The crowding-out effect is a fundamental concept that explains how increased government borrowing can lead to a reduction in private investment. According to this theory, when the government borrows heavily, it competes for available funds in the financial markets, which can lead to rising interest rates. As interest rates increase, borrowing costs for private investors also rise, potentially deterring firms from making new investments. This is particularly relevant in Nigeria, where financial markets are often less developed and vulnerable to fluctuations in government borrowing (Obi & Nwosu, 2018).

The Keynesians argue that during periods of economic downturn or low private sector investment, government borrowing can stimulate demand and promote economic growth. By using borrowed funds to finance infrastructure projects, social services, and other public investments, the government can create jobs and boost overall economic activity. This, in turn, can lead to increased private sector investment as businesses respond to higher demand (Ibrahim et al., 2020). In Nigeria, where infrastructure deficits are significant, government spending financed through borrowing can have positive spillover effects and can enhance the investment climate and encourage private sector participation.

Government borrowing in Nigeria has significant implications for investment, but is accompanied by various challenges that can affect its overall efficacy. Understanding these challenges is crucial for evaluating how government borrowing impacts investments in the country. One of the primary challenges of government borrowing in Nigeria is the high level of public debt, which has escalated in recent years. As of 2021, Nigeria's debt-to-GDP ratio was 35%, prompting concerns about sustainability (World Bank, 2021). High levels of debt can lead to increased interest payments, which may consume a substantial portion of the government's budget. This effect can hinder public investment in critical areas such as infrastructure, education, and health, which are essential for fostering a conducive investment environment (Adeleke & Afolabi, 2021).

The Nigerian economy rests heavily on oil revenues, which fluctuate dramatically due to changes in global market conditions. When oil prices fall, government revenues decline, leading to increased borrowing to fund budget deficits. This scenario can create a vicious cycle: as the government borrows more, the resulting higher interest rates can crowd out private investment, hence further exacerbating economic challenges (Oni & Salau, 2019). Consequently, dependency on oil revenues makes Nigeria's economy vulnerable to external shocks, impacting both government borrowing and investment levels. Furthermore, the impact of government borrowing on investment is also influenced by the prevailing exchange and interest rates. When the government borrows extensively, it can drive up interest rates due to increased demand for loanable funds. Higher interest rates can deter private sector investment as businesses face higher costs of borrowing (Ibrahim et al., 2020).

In a developing economy like Nigeria, where access to credit is limited, increased interest rates can stifle entrepreneurial activities and discourage both domestic and foreign investments. Despite these challenges, government borrowing can have positive effects on investment if managed properly through investment in the real sector, developing infrastructure and improving the business environment, which can boost investors' confidence and attract more investments. Given the above scenario, the study broadly sought to examine the effects of government borrowing on private investment in Nigeria. Specifically, the study sought to:

- i. examine the relationship between government borrowing and private investment in Nigeria, and
- ii. examine the relationship between government expenditure on infrastructural development and private investment in Nigeria.

This work is arranged in five sections. Following the introduction is the literature review in section two, section three is the methodology, followed by data analysis and discussion of findings in section four. Section five offers the recommendations and conclusion.

## **2.0 Literature Review**

### **2.1 Conceptual Review**

#### **2.1.1 Government Borrowing**

Government borrowing is the financial liability of the government sector. It constitutes government debt (public or national debt), which requires servicing and repayment. Government borrowing, also known as government debt or national debt, can also be referred to as the accumulated borrowing by a government entity to fund its expenditures that exceed its revenue.

In essence, the act of government borrowing engenders the phenomenon of public debt. Nymphas et al. (2023) characterise public debt as the totality of outstanding bonds that have been issued by the government at any point in the historical timeline but remain unredeemed. The principal objective of such borrowing activities is to address the government budgetary shortfall, which occurs when the government is unable to augment its revenue streams and is not inclined to reduce its anticipated expenditures to align with its fiscal plans.

Ikwuo et al. (2024) argue that the imperative to finance essential infrastructure and various developmental initiatives amid constrained resources, stemming from insufficient savings, is the predominant rationale for national borrowing. Government borrowing may occur from domestic sources or international entities. The acquisition of funds from within the national economy is classified as domestic debt, whereas borrowing from foreign nations and global financial institutions is categorised as external debt.

Thus, government borrowing could be divided into two categories: external debt and domestic debt. Domestic debts are debts which the government of a country owes its citizens. In other words, it is debt that originates from within the geographical region of a country, which is contracted through debt instruments such as federal government bonds, Nigerian treasury bills, treasury bonds, development stocks, Federal government savings bond, federal government Sukuk, Green bond and promissory notes (CBN, 2023). On the other hand, external debt is debt owed to foreign countries or foreign financial institutions. External debt is the amount, at any given time, of disbursed and outstanding contractual liabilities of residents of a country to non-residents to repay principal, with or without interest, or to pay interest, with or without principal (World Bank, 2019). It comprises the multilateral debt, bilateral debt, Euro bond, diaspora bond, promissory notes and others (CBN, 2023).

### **2.1.2 Investment**

Investment can be defined as the net addition to a nation's physical stock of capital (Kilic et al., 2022). This definition is often used in macroeconomic analysis. In economics, investment involves the production of goods that will be used to produce other goods. This perspective distinguishes economic investment, e.g., building a new factory, from simply trading existing financial assets, e.g., buying a stock. In finance, it is a financial asset purchased with the expectation that the asset will generate income in the future or will later be sold at a higher price for a profit (Artikis et al., 2022; Boasiako et al., 2022). This definition views investment as a financial instrument and the objective of earning a return.

Keynes (1936) provides a more nuanced view, suggesting that investment decisions are influenced by expectations about future economic conditions. He posits that investment is not solely a function of current resources or capital. It is also deeply rooted in the psychological factors affecting investors' confidence. This notion introduced the idea that investment behaviour can be volatile and affected by external economic variables. In the realm of personal finance, investment is often defined as the allocation of money to various financial instruments to achieve capital appreciation or income generation (Graham & Dodd, 2008). This definition is particularly relevant for individual investors who seek to grow their wealth through strategic asset allocation. Moreover, the concept of risk is integral to investment as noted by Markowitz (1952), who introduced the idea of portfolio theory. He posited that investors must consider the trade-off between risk and return when making investment choices, thereby incorporating a strategic approach to investment that aligns with individual risk tolerance levels.

Investment plays an important role in the functioning of an economy, whether developed or underdeveloped. The economic growth of most economies is derived from investment in these economies. No wonder investment is seen as a propellant of economic growth. To this end, measures are taken by the governments of various countries, of which Nigeria is not exempt, to encourage investment to boost high productivity, innovation, employment level, standard of living, reduce poverty level, and ultimately accelerate economic growth (Ajaikaiye, 2002). Investment in various sectors of output demands income, which also increases government revenue for the provision of essential services towards the growth and development of an economy. This entails that the investment multiplier increases national income, which in turn increases savings for investment, consumption and aggregate demand level, which gives rise to the standard of living.

## **2.2 Theoretical Framework**

### **2.2.1 Keynesian Theory of Government Debt**

The Keynesian theory of government borrowing was proposed by John Maynard Keynes in 1936. He put forward that during periods of economic downturn, private sector demand often falls short, leading to unemployment and underutilization of resources. To affirm this, he argued that government intervention through borrowing and spending could stimulate demand, boosting economic activity and employment (Keynes, 1936).

The core assumptions of Keynesian theory are that economies do not always self-correct to full employment due to rigidity in prices and wages. This implies that government intervention is necessary to fill the gap in aggregate demand. According to Keynes, increased government spending, financed through borrowing, can lead to a multiplier effect where the initial spending stimulates further consumption and investment by businesses and households (Mankiw, 2014). However, the Keynesian approach to government borrowing has faced several critiques. One major concern is the long-term sustainability of public debt.

Critics argued that excessive borrowing can lead to higher interest rates, crowding out private investment, as government borrowing might absorb available funds in the financial market (Barro, 1974). Moreover, there is a fear that persistent borrowing can lead to inflationary pressures if the economy operates near or at full capacity (Friedman, 1968). Despite these critiques, Keynesian theory remains relevant in discussions of investment in the economy. Government borrowing can finance infrastructural projects, education, and research and development, which ultimately enhance productivity and foster an environment conducive to private investment. (Blanchard & Leigh, 2013). Furthermore, Keynesian economics emphasised the role of expectations in shaping investment. When the government borrows and spends, it signals confidence in future economic conditions, which can encourage private businesses to invest as well (Aghion & Howitt, 2009).

### **2.2.2 Neoclassical Theory of Government Borrowing (Crowding Out Effect)**

The crowding out effect of government borrowing was developed by Peter A. Diamond, who integrated government borrowing into a neoclassical growth model to examine its long-run effects on economic equilibrium in 1965. The theory states that any increase in government borrowing raises interest rates. As interest rates rise, private investment becomes costlier, leading to a reduction in private sector spending, where the demand for funds in the loanable funds market increases due to government borrowing. This drives up the price of borrowing (interest rate). The economy operates under conditions of perfect certainty. The theory assumed that;

- i. Government debt has a one-period maturity and is rolled over each period at the current interest rate.
- ii. Debt can be either internally held (by residents) or externally held (by foreign entities).
- iii. Individuals make consumption decisions over their lifetime, and savings behaviour influences capital accumulation.
- iv. Capital markets are assumed to be perfect in the model context.
- v. There is a trade-off where government borrowing can reduce both available lifetime consumption and savings.

Critiques of the neoclassical theory of the crowding-out effect highlight potential limitations in its assumptions. They argue that the model assumes a perfectly competitive market, which does not account for imperfections or frictions that could allow for simultaneous government spending and private investment. Moreover, Keynesian economists contend that in times of economic downturn

or recession, the crowding out effect may be less pronounced or non-existent, as the economy operates below capacity and additional government spending could stimulate demand without significantly increasing interest rates (Blinder, 2000).

### **2.3 Empirical Literature**

Different views on the impact of government borrowing on investment in the literature exist, while some support the crowding-out effect, others argue that it is a crowding-in effect.

Using the cointegration technique and error correction model, Obudah & Tombofa (2013) investigated the effects of domestic debt and interest rate on private equity investment growth and examined whether the crowding-out hypothesis held in Nigeria for the period between 1987 and 2010. The a priori expectation of domestic debt and GDP growth having a positive impact on equity investment holds. However, an inverse relationship exists between the monetary policy rate and equity investment.

Using the Johansen cointegration technique and Vector Error Correction Model (VECM), Akomolafe et al. (2015) aimed at investigating the effect public borrowing has on private investment in Nigeria using time-series data from 1980 to 2010 to examine this relationship. The study disaggregated public debt into domestic and external debt. The empirical results revealed that domestic debt crowds out domestic investment both in the short run and long run, while external debt crowds in domestic investment in the long run.

Adetokunbo & Ebere (2019) delved into an empirical investigation on determinants and analysis of domestic debt in Nigeria from 1970 to 2015 using data from the Central Bank. Findings suggested that there exist bi-directional granger causalities between domestic debt and budget deficit, domestic debt and external debt and domestic debt and GDP growth rate. The research differed from this paper in terms of scope. While the author concentrated on domestic debt and budget deficit, this paper delved into the details of the impact of both domestic and external debt on domestic private investment.

Efuntade et al. (2020) empirically investigated the impact of external debt on economic growth in Nigeria between 1981 and 2018 using the ARDL, ECM estimation technique. The variables used in the study were tested for stationarity using the Augmented Dickey-Fuller test. The result revealed that external debt, domestic debt, foreign direct investment and government expenditure were stationary at first differencing, while GDPGR was stationary at the level. Their findings showed external debt and foreign direct investment.

Eke & Akujuobi (2021) investigated the effect of public debt on economic growth in Nigeria, covering the period 1981-2018. Employing a co-integration approach, the study revealed, among others, that a significant short-run relationship existed between Nigeria's public debt and economic growth. Also, whereas both the domestic debt and the external debt variables were statistically significant, only the latter failed the a priori expectation test and thus, exerted a negative contribution to economic growth in Nigeria

Anoke et al. (2021) investigated the relationship between public debt and domestic private investment in Nigeria from 1980 to 2018. The objectives were to: determine the effect of external debt and domestic debt on domestic private investment in Nigeria, examine the effect of debt servicing on domestic private investment in Nigeria and determine the direction of causality between public debt and domestic private investment in Nigeria. A vector error correction model was employed to determine the relationship between the dependent and the independent variables. Findings indicated that external debt had a significant negative impact on domestic private investment, domestic debt had a negative and significant effect on domestic private investment,

debt servicing had a negative and insignificant impact on domestic private investment and there was no directional causality between public debt and domestic private investment in Nigeria.

Ekperiware et al. (2022) assessed the effect of public debt on economic growth in Nigeria. The data were obtained from the Debt Management Office and the Federal Office of Statistics. The Vector Error Correction Model (VECM) was used to analyse the data. The findings confirmed that domestic debt in the short run was inversely related to growth but positively related in the long run, while external debts were both negatively related to economic growth in both the short run and the long run. The findings confirmed that public debts significantly affected economic growth.

Abdulummin (2022) examined the effect of public debt on economic growth in Nigeria. The study employed secondary data sourced from the Central Bank of Nigeria Statistical Bulletin for the period 1987 to 2020. The study adopted an ex-post facto research design. The Autoregressive Distributed Lag (ARDL) was used for data analysis, which revealed that external debt was a positive determinant of economic growth in Nigeria, with a p-value of 0.0255. Also, domestic debt was significant and a negative determinant of economic growth in Nigeria, with a coefficient value of 0.0005. The study concluded that public debt had a significant effect on economic growth in Nigeria.

### 2.3.1 Evaluation of Empirical Literature Reviewed

The reviewed studies have not reached a consensus on the actual relationship between government borrowing and private investment, owing to their differences in views, scope, the specification of econometric models, and selection of variables, variations in the results and interpretation. While most of the reviewed works emphasised public debt and economic growth, this study concentrates on government borrowing and private investment, using the aggregation of government borrowing (domestic and external borrowing) in Nigeria.

## 3 Research Methodology

### 3.1 Research Design

An ex-post facto research design and econometric method were employed in this study. It is an ex-post facto research design in that the data generated were already put in place and not subject to the manipulation of the researcher. It is an econometric research method in that the data collected were analysed by employing the econometric methodology of multiple regression.

### 3.2 Source and Type of Data

The data used for analysis in this study were obtained from secondary sources. The annual time series data, which covered the period 1986 -2023, were principally obtained from the Central Bank of Nigeria Statistical Bulletin and World Development Indicators of various years.

### 3.3 Model Specification

The theoretical framework for the study is the crowding-out effect hypothesis. The theory assumes that an increase in government spending, especially when financed by borrowing, can reduce private sector investment by raising interest rates. Thus, incorporating the theory to achieve the study objective, the notional functional form of the model is specified as:

$$PINV = f(AGB) \dots\dots\dots (1)$$

To accommodate control variables that have the capacity to influence the dependent variable, we specified:

$$PINV = f(AGB, GEXIF, INTR, EXR, GDPGR, INFR) \dots\dots\dots (2)$$

Where PINV is private investment, AGB is the government borrowing as a percentage of GDP, GEXIF is the government spending on infrastructural development, EXR is the rate of exchange, GDPGR is the gross domestic product growth rate, INTR is the lending rate of Interest, which represents the cost of borrowing in the economy, and INFR is the inflation rate. However, the variables are transformed into econometric forms as:

$$PINV_t = \beta_0 + \beta_1 AGB_t + \beta_2 GEXIF_t + \beta_3 INTR_t + \beta_4 EXR_t + \beta_5 GDPGR_t + \beta_6 INFR_t + et \dots \dots \dots (3)$$

where the variables are explained above,  $\beta_1 - \beta_6$  are parameters of estimation,  $\beta_0$  is the constant parameter, and  $et$  is the error term. It is expected that  $\beta_1, \beta_2, \beta_4, \beta_5$  and  $\beta_6 > 0$  while  $\beta_3 < 0$ .

### 3.4 Methods of Analysis

The study adopted the Autoregressive Distributed Lag Model (ADRL) technique to estimate the effect of the predictor variables on the explanatory variable in the short-run and the long-run. The econometric package used in this analysis was Econometric Views (E-Views 10). The result of the model was evaluated based on three criteria, such as econometric a’p priori expectation, statistical test of significance and econometric test.

## 4. Data Presentation, Analysis and Discussion of Findings

In this section, the data employed in the study are analyzed in two perspectives, which are: descriptive and econometric.

### 4.1 Descriptive Analysis

Descriptive statistics refer to techniques used to summarise and describe the main features of a dataset in a concise and meaningful way without concluding the data itself. They help to provide a clear snapshot of the data, including the centre, spread, and distribution shape.

**Table 4.1:** Data Presentation

YEAR	AGB ₦' Billion	AGBGR (%)	PINV (₦' Billion)	PINVGR (%)
1986	69.89	-	7.12E+12	-
1987	137.58	96.85	6.03E+12	-15.28
1988	180.99	31.55	6.05E+12	0.24
1989	287.44	58.82	5.66E+12	-6.34
1990	382.71	33.14	6.03E+12	6.53
1991	444.65	16.19	6.44E+12	6.79
1992	722.23	62.42	7.34E+12	13.89
1993	906.98	25.58	7.24E+12	-1.30
1994	1056.40	16.47	7.28E+12	0.52
1995	1194.60	13.08	7.83E+12	7.56
1996	1037.30	-13.17	7.64E+12	-2.45
1997	1097.68	5.82	7.14E+12	-6.58
1998	1193.85	8.76	7.62E+12	6.83
1999	3372.18	182.46	8.07E+12	5.88
2000	3995.64	18.49	8.19E+12	1.43
2001	4193.27	4.95	8.41E+12	2.70
2002	5098.89	21.60	9.02E+12	7.30
2003	5808.01	13.91	6.96E+12	-22.79
2004	6260.59	7.79	7.68E+12	10.31

2005	4220.98	-32.58	9.34E+12	21.52
2006	2204.72	-47.77	7.54E+12	-19.18
2007	2608.53	18.32	7.79E+12	3.25
2008	2843.56	9.01	1.1E+13	40.74
2009	3818.47	34.28	8.6E+12	-21.55
2010	5241.66	37.27	8.42E+12	-2.12
2011	6519.69	24.38	9.22E+12	9.56
2012	7564.44	16.02	9.59E+12	3.98
2013	8506.31	12.45	8.83E+12	-7.92
2014	9535.53	12.10	9.13E+12	3.36
2015	10948.51	14.82	9.84E+12	7.82
2016	14537.12	32.78	1.11E+13	12.99
2017	18377.00	26.41	1.09E+13	-1.53
2018	20533.64	11.74	1.04E+13	-4.67
2019	23295.07	13.45	1.02E+13	-1.83
2020	28729.50	23.33	1.12E+13	9.38
2021	35097.79	22.17	1.19E+13	6.32
2022	40912.62	16.57	1.03E+13	-13.90
2023	91477.86	123.59	1.07E+13	4.39

**Source:** Central Bank of Nigeria (CBN) *Statistical Bulletin*, 2023, Vol. 34, 1-24.

**Note:** AGB - Aggregate Borrowing, PINV - Private Investment, AGBGR- Growth Rate of Aggregate Borrowing, PINVGR – Growth Rate of Private Investment.

From 1986 to 1990, aggregate borrowing (AGB) sharply increased with high growth rates, while private investment (PINV) remained volatile with mostly negative or minimal growth. This suggests rising borrowing did not translate into sustained private investment growth, indicating possible crowding-out or inefficiencies in investment conversion. Between 1991 and 1995, aggregate borrowing (AGB) and its growth rate (AGBGR) increased significantly but showed a declining growth trend. Private investment (PINV) steadily rose, except for a slight dip in 1993, indicating improvement in private sector investment amidst rising borrowing.

From 1996 to 2000, aggregate borrowing (AGB) steadily increased, with moderate growth rates around 24-25% until a sharp rise in 1999 and 2000. Private investment (PINV) fluctuated, experiencing declines in 1996-1997 but recovered with growth from 1998-2000. This indicated an increase in borrowing amidst fluctuations, thereby improving private investment, reflecting economic challenges and gradual stabilisation during this period. The sharp increase in borrowing in 1999 coincided with heightened fiscal activity, while private investment showed tentative growth recovery after prior contractions, possibly influenced by broader economic reforms and debt management efforts.

Between 2001 and 2005, aggregate borrowing grew robustly but declined gradually, while domestic private investment fluctuated, experiencing a sharp drop in 2003. This suggested that borrowing surged and private investment fluctuated, leading to crowding out of investment during the period due to economic uncertainties and a shift in investment dynamics. Between 2006 and 2010, aggregate borrowing grew slowly but steadily, while private investment fluctuated sharply, with significant declines in 2006, 2009, and slight drops in 2010, indicating that government borrowing might have crowded out private investment during that period. The data reflects economic instability affecting investment growth. From 2016 to 2023, aggregate borrowing steadily increased, with growth rates rising sharply in 2023. Private investment fluctuated, showing

both declines and recoveries, suggesting evolving economic conditions influencing investment performance amid rising borrowing levels in Nigeria.

## 4.2 Econometric Analysis

### 4.2.1 Stationarity Test

To avoid spurious regression, stationarity tests were conducted on all the variables to ascertain their stationarity property. To satisfy the stationarity property of the time series, the Phillips-Perron test statistics were employed. The decision rule is that the Phillip-Perron t-statistic in absolute value must be higher than the 5% critical value for any variable to be stationary. Thus, the stationarity test result is presented in Table 4.2.

**Table 4.2:** Phillip-Perron Stationarity Test Result

Variables	Phillip-Perron t-statistic	Prob. Value	Integration Order
GDPGR	-3.9927	0.0038	I(0)
EXR	-6.0756	0.0000	I(1)
AGB	-4.4790	0.0010	I(1)
GEXIF	-4.5268	0.0047	I(0)
PINV	-7.4880	0.0000	I(0)
INFR	-5.9750	0.0000	I(1)
INTR	-4.0770	0.0030	I(0)

**Source:** Computed by the Authors using EViews 10

Table 2 shows the unit root test of the variables used in the study. The unit root test was carried out using the Phillips-Perron test. The Akaike selection criterion was chosen for the unit root test. The decision rule states that for the variable to be stationary at any level, the absolute value of the t-statistic must be higher than the absolute critical value at a 5% significance level. According to the results in Table 1, the unit root test indicated that all variables used in this study were stationary at both the level and the first difference.

### 4.2.2 Correlation Matrix

The correlation matrix is a square table where each cell represents the correlation coefficient between two variables. It is also a table that displays the correlation coefficients between all pairs of variables in a dataset, helping to visualise and quantify the strength and direction of linear relationships. The coefficient ranges from -1 to +1, indicating the strength and direction of the linear relationship. For the study, the correlation result is presented in Table 4.3.

**Table 4.3:** Correlation Test Result

	PINV	AGB	INTR	INFR	GEXIF	GDPGR	EXR
<b>PINV</b>	1.000000	-0.014654	0.162460	-0.050421	0.156490	0.063850	0.213717
<b>AGB</b>	-0.014654	1.000000	0.127835	0.334867	-0.628426	-0.086726	-0.637560
<b>INTR</b>	0.162460	0.127835	1.000000	0.120800	0.341137	-0.137032	0.418890
<b>INFR</b>	-0.050421	0.334867	0.120800	1.000000	-0.315973	-0.157668	-0.324799
<b>GEXIF</b>	0.156490	-0.628426	0.341137	-0.315973	1.000000	-0.100750	0.771410
<b>GDPGR</b>	0.063850	-0.086726	-0.137032	-0.157668	-0.100750	1.000000	0.088083
<b>EXR</b>	0.213717	-0.637560	0.418890	-0.324799	0.771410	0.088083	1.000000

**Source:** Computed by the Authors using EViews 10

The result in Table 3 represents the correlation result between the dependent and independent variables. The result shows a negative correlation between government borrowing and private investment in Nigeria. This implies that an increase in government borrowing decreases investment in Nigeria, suggesting a weak correlation between government borrowing and investment in Nigeria. Moreover, gross domestic product growth rate, interest rate, and exchange rate have a positive correlation with investment in Nigeria, while inflation rate has a negative correlation with private investment in Nigeria. The result also reveals that there was no multicollinearity among the independent variables in the model.

#### 4.2.3 Co-integration Test

This test was adopted to examine whether the variables have a long-run relationship (i.e., whether they are co-integrated in the long run). The co-integration test was carried out using the autoregressive distributed lag bound test. Thus, the autoregressive distributive lag bound test is presented in Table 4.4.

**Table 4.4: ARDL Bound Test**

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	11.39744	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

**Source:** Computed by the Authors using EViews 10

The co-integration test result presented in Table 4 shows that the variables used in this study have a long-run relationship. This is from the evidence that the F-statistic value of 11.3974 is greater than the lower bound value of 2.27 and upper bound value of 3.28 at the 0.05% critical value. This implies that the dependent variable can be sufficiently predicted in the long run using the explanatory variables. Hence, the error correction model is estimated.

#### 4.2.4 Error Correction Model

An ECM is used when variables are cointegrated, meaning they have a long-run equilibrium relationship. It models the short-run dynamics of the variables while ensuring they converge back to the long-run equilibrium.

**Table 4.5:** Error Correction Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PINV(-1))	0.419341	0.113674	3.688987	0.0017
D(AGB)	-1.113213	0.387934	-2.869596	0.0102
D(AGB(-1))	1.253813	0.319277	3.927041	0.0010
D(INTR)	0.400877	0.387221	1.035267	0.3143
D(INTR(-1))	3.252391	0.575742	5.649040	0.0000
D(INFR)	-0.145079	0.094819	-1.530053	0.1434
D(GDPGR)	-2.217784	0.499509	-4.439933	0.0003
D(GDPGR(-1))	-1.647281	0.400696	-4.111050	0.0007
D(EXR)	35.49972	12.10345	2.933024	0.0089
D(EXR(-1))	-61.41012	13.35139	-4.599531	0.0002
GEXIF	-0.062105	0.419458	-0.148059	0.8839
CointEq(-1)*	-0.711179	0.188204	-11.25336	0.0000
R-squared	0.881674	Mean dependent var		0.546509
Adjusted R-squared	0.834343	S.D. dependent var		19.01477
Durbin-Watson stat	2.315176			

Private investment (PINV(-1)) has a coefficient of 0.4193, which is statistically significant ( $p = 0.0017$ ). This indicates that the previous period lag of PINV had a negative effect on the current period's change in PINV. The aggregate government borrowing (AGB) coefficient is -1.1132, which is statistically significant ( $p = 0.0102$ ). This suggests that government borrowing has a negative relationship with investment in Nigeria in the short run. Also, the second-period lag of government borrowing has a positive and negative relationship with private investment in Nigeria.

The exchange rate estimated coefficient is 35.4997, which is statistically significant ( $p = 0.0089$ ). This suggests that the exchange rate has a positive and significant effect on the change in investment in the short run. However, the second period lag of the exchange rate has a negative and significant relationship with investment in Nigeria. Also, the current and immediate value gross domestic product growth rate estimated value is -2.2177 and -1.6472, and the probability value of 0.0003 and 0.0007 has a negative relationship with investment in the short run. This implies that a percentage change in current and immediate lag of gross domestic product will lead to 2.2177% and 1.6472% changes in investment.

The inflation rate estimated parameter is -0.1450, and its probability value is 0.1434. This shows that inflation has a negative and insignificant relationship with investment in Nigeria, and a per cent change in inflation will lead to a 0.1450% change in investment in the short term. Similarly, the government expenditure on infrastructural development estimated parameter is -0.0621, and its probability value is 0.8839. This shows that government expenditure in infrastructural development has a negative and insignificant relationship with private investment in Nigeria, and a per cent change in government expenditure on infrastructural development will lead to a 0.0621% decrease in investment in the short term. The interest rate has an estimated coefficient of 0.4008 and the probability value of 0.3143, which implies that the interest rate has a positive and insignificant relationship with investment in Nigeria. Also, a per cent increase in the rate of interest increased investment by 0.4008% in the short-run.

The Error Correction Model (ECM) in econometrics is a statistical technique used to estimate how quickly a dependent variable returns to its long-term equilibrium after a short-term change or shock in related variables. It integrates both short-term dynamics and the long-run equilibrium relationship between variables by incorporating an error correction term, which

measures the deviation from the equilibrium and corrects it gradually over time through short-term adjustments. The coefficient of the error correction model is -0.711179, which is statistically significant ( $p = 0.0000$ ). The negative sign is crucial; it indicates that when investment deviates from its long-run equilibrium, a correction mechanism is in place to pull it back. The magnitude of -0.711179 indicates that approximately 71.11% of the disequilibrium is corrected in each period.

R-squared (0.881674) and Adjusted R-squared (0.834343): These values are high, indicating that the model explains a substantial portion of the variance in the change in private investment. Durbin-Watson statistics (2.315176), which are used to detect autocorrelation in the residuals, indicate no autocorrelation. This implies that the error terms are not correlated, which makes the regression estimate reliable for decision-making.

**Table 4.6: ARDL Long-run Regression Result**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGB	0.348588	0.135317	2.576082	0.0190
INTR	-2.007593	0.752737	-2.667057	0.0157
INFR	0.135718	0.098436	1.378736	0.1849
GEXIF	-0.029323	0.197155	-0.148732	0.8834
GDPGR	-1.552566	0.602304	-2.577712	0.0190
EXR	8.395273	2.720126	3.086354	0.0064
C	8.721563	9.473073	0.920669	0.3694

**Source:** Computed by the authors using EViews 10

The significance of each variable is determined by its Prob. (p-value), with a common threshold of 0.05. A p-value less than or equal to 0.05 indicates a statistically significant effect. The Lending Rate of Interest (INTR) estimated coefficient value is -2.0075 with a p-value of 0.0157, indicating a significant negative relationship. This entails that for a one per cent increase in the lending rate of interest, private investment decreases by approximately 2.0075%. This is a common finding, as higher borrowing costs tend to discourage new investments. Gross Domestic Product Growth Rate (GDPGR) has an estimated parameter value of -1.5525 with a p-value of 0.0190, suggesting a significant negative relationship with investment. This finding is counterintuitive, as one would expect a positive relationship. This implies a "crowding-out" effect where rapid GDP growth is driven by factors that compete with private investment,

The Exchange Rate (EXR) estimated coefficient is 8.395273 with a p-value of 0.0064, indicating a significant positive relationship. This implies that for 1% increase in the exchange rate, investment increases by approximately 8.3953%. This might be the case if the exchange rate is defined as domestic currency per unit of foreign currency, where depreciation (an increase in the exchange rate) makes the country's assets cheaper for foreign investors, thereby attracting more investment. Government borrowing (AGB) has an estimated coefficient of 0.348588 with a p-value of 0.0190, indicating a significant positive relationship with investment. This indicates that for a 1% increase in government borrowing as a percentage of GDP, investment increases by approximately 0.3486% in the long run. An increase in private investment could be due to government spending financed by government borrowing, boosting economic activity and confidence, thus encouraging private investment.

Rate of Inflation (INFR) has a slope value of 0.1357, a p-value of 0.1849, which is above the 0.05 significance threshold. Therefore, there is no statistically significant evidence of a long-run relationship between the rate of inflation and investment. Government Expenditure on Infrastructural Development (GEXIF) has an estimated coefficient of -0.0293, and a p-value of

0.8834, indicating no statistically significant long-run relationship with private investment. This means that, for the period studied, this specific type of government expenditure did not have a strong direct impact on the dependent variable.

The constant term represents the value of the investment when all independent variables are zero. Its p-value of 0.3694 is not statistically significant, meaning that investment will increase by 0.3694% in the long run, assuming all explanatory variables in the model are held constant. The increase in investment when all the independent variables are constant is due to other economic variables that influence investment, such as environmental policy, political stability, and other variables not captured in the model.

#### 4.2.5 Diagnostic Test

To ensure that the model used in this study satisfies the ordinary least squares assumptions, diagnostic tests were carried out to check for goodness of fit, serial correlation test and heteroscedasticity test. The results are stated in Table 4.7.

**Table 4.7: Diagnostic Test Results**

	F-statistics	Prob. (F-statistics)	Decision
Heteroskedastic Test	0.5032	0.9182	Homoscedastic
Serial Correlation	0.8637	0.4403	No autocorrelation

**Source:** Computed by the Authors using EViews 10

#### Serial Correlation

From Table 4.7, the F-statistic value of 0.8637 and the p value of 0.4403 are greater than the 0.05% critical value; therefore, the null hypothesis of no serial correlation is accepted, and it is concluded that there is no serial correlation among the variables. Also, the Durbin-Watson statistics confirm the presence of no serial correlation in the model, given that the Durbin-Watson value of 2.3151 confirms no serial correlation in the model.

#### Heteroskedasticity

From Table 4.7, the prob (F-statistic) is 0.9182, which is greater than the 0.05% critical value; therefore, the null hypothesis is accepted, and it is concluded that the models are homoscedastic, meaning that the variance of the errors is constant across different values of the independent variables.

### 4.3 Policy Implications of Findings

Based on the finding that government borrowing has a negative short-run relationship with private investment but a positive long-run relationship, the negative short-run relationship, often referred to as crowding out, suggests that an increase in government borrowing immediately leads to a decrease in private investment. This can happen when the government's demand for funds in the credit market drives up interest rates, making it more expensive for private firms to borrow for their investment projects. The positive long-run relationship implies that over time, the initial negative effects of government borrowing are outweighed by its positive contributions to the economy. This is likely due to government spending on productive assets like infrastructure, education, or R&D, which enhances the overall productivity and profitability of the economy.

These public investments reduce business costs, increase human capital, and create a more conducive environment for private firms to invest in.

A negative relationship between government expenditure on infrastructural development and investment implies that this spending crowds out private investment in the long run. The finding suggests that public infrastructure spending is displacing or discouraging private investment, rather than complementing it. This is because some spending by the government could be on inefficient or politically motivated projects that don't generate the expected economic returns. Such projects fail to improve the business environment and may signal a misallocation of resources, reducing private sector confidence. Also, Government projects may compete with the private sector for resources like labour, capital, and raw materials, driving up their costs and making it less profitable for private firms to invest.

A negative relationship between Nigeria's GDP and investment is a highly unusual finding that suggests economic growth is not translating into a conducive environment for private investment. This indicates that growth is likely being driven by factors that do not encourage long-term capital formation, such as consumption or volatile commodity exports. The core policy implication is that the government must actively correct this disconnect to achieve sustainable and inclusive development.

## **5. Recommendations and Conclusion**

### **5.1 Recommendations**

Based on the research findings, the following recommendations were made:

- i. The government should direct funds towards projects that have immediate positive spillovers for the private sector, such as grants or subsidies for small businesses, to mitigate the crowding-out effect. It should also prioritise borrowing for long-term productivity and enhancing projects such as building roads, ports, and a reliable power grid, or investing in education and technology.
- ii. The policymakers should focus on selecting and executing infrastructure projects based on sound economic analysis and a high return on private investment. Projects should be transparently managed to ensure that funds are not wasted. This is to build private sector confidence. Also, the government should prioritise infrastructure investments that directly reduce the costs of doing business for the private sector. Examples include improving transportation networks to lower logistics costs and upgrading energy grids to ensure a reliable power supply.

### **5.2 Conclusion**

Findings indicate that government borrowing in Nigeria negatively affects private investment in the short run, due to crowding out of private investment as government borrowing increases interest rates and limits capital availability. However, in the long run, government borrowing positively influences private investment. This implies that borrowed funds directed to financing productive initiatives and improving investment environments will enhance investment opportunities, which will engender economic growth.

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