Determining Private Investments in Nigeria: The Effect of Domestic Debt

Ogaga, T. C.
timiepereo@gmail.com

Robert B. J.
robertbj@fuotuoke.edu.ng

DOI 10.56201/ijebm.v10.no2.2024.pg17.36

Abstract

This study examined the effect of public debt on investments (private and public) in Nigeria for the long-run period of 1981 to 2022. The study examined a number of significant public debt variables that are difficult to neglect when trying to understudy the effects of public debt. The variable is government domestic debt (DMD). The control variables, which are GDP growth rate, total government revenues, total government expenditures, inflation and private sector credits in Nigeria are coded GDPG, GVR, GVX, INF and CPS. The result of the study showed that government domestic debt boosted private investment. In all, private investments have benefitted more from domestic public debt. This means that domestic public debt crowd in more of private investments, all things being equal. In line with the findings/conclusion made in this study, the following recommendations are put forward: The most concern drawn from the positive significance of government domestic debt is that its increases impede private sector credits. As this is, it means that the complementary role of the monetary policy has not been seen. The CBN, in the face of increasing domestic public debt, should enhance policy directions to also increase private sector credits.

Keywords: Domestic Public Debt; Private Investment; Crowding Out/In Effect; ARDL; Nigeria

1. Introduction

Private investment is crucial for driving economic growth and providing job opportunities (Epor, Ibenta, Yua & Nwakoby, 2023; Enabulu & Epor, 2022). Businesses invest in new technology, equipment, and facilities to develop and boost productivity. Private investment also promotes innovation, competitiveness, and general economic development. However, the quantity of private investment in an economy may be impacted by a number of factors, including government policies, the regulatory environment, credit availability, market circumstances, and investor confidence. Nigeria's goal to build its economy has led to efforts to improve its infrastructure, institutions, and human capital. According to Kulu, Brafu-Insaidoo, Peprah, and Bondzie (2022), most Sub-Saharan African (SSA) nations have recognized the private sector as the engine of economic growth, making private sector activities very essential to policymakers. To supplement this, the government deemed it vital to demonstrate accountability through different fiscal policy measures

that might encourage an enabling climate for investments by both national and foreign investors (Ebhotemhen, 2020).

Nigeria, like other developing countries, frequently experiences a financing shortage when implementing developmental initiatives. Public debt is a significant way of bridging the government's funding shortfalls (Epor, Ibenta, Yua, and Nwakoby, 2023). Public debt can be incurred through a variety of mechanisms, including the issuance of government bonds, treasury bills, and borrowing from international financial organizations. Public debt is frequently used to fund government expenditures such as infrastructure projects, social welfare programs, and war spending. However, excessive governmental debt levels can have a negative effect on the economy, leading to increased interest rates, inflation, and crowding out private investment. This stance is consistent with the debt overhang hypothesis, which states that a major debt problem discourages current government-supported expenditure in the economy by providing little motivation and capacity for it to dig itself out of the hole (Ekpe, 2020). From another perspective, Olaifa and Benjamin (2020) proposed the crowding out hypothesis, which states that increased government expenditures can lower private investment and so slow economic development. This may eventually have an impact on the provision of suitable public services that complement private investment and increase private sector engagement in the economy.

Data from the Central Bank of Nigeria showed that the domestic debt of government averaged 10.31% of GDP since 2015. Domestic has been fairly stable in trend, rising from 9.28% in 2015 to 10.96% in 2017 and gradually to 11.09% in 2021. In terms of public debt portfolios, domestic debt is a budget charge that must be repaid by government revenues and/or further borrowings (Anoke, Odo & Nnabu, 2021). Government borrowing from domestic sources is critical in promoting investment and private savings, as well as improving domestic financial markets, because it offers liquidity to markets when appropriately used (Epor, Ibenta, Yua, & Ityavyar, 2023). However, Nigeria's public debt has risen over the years, and it's worth noting that transferring society's scarce resources from productive private to unproductive public sectors slows both the private sector and the economy overall. This is why it is critical to perform this research to identify the consequences of public debt on investments in Nigeria.

The relationship between domestic public debt and private investment is often influenced by trade-offs and interdependencies, with high public debt potentially stifling private investment in capital markets (Hamadou, Nourou, Oumarou & Zakariyaou, 2022; Anoke, Odo & Nnabu, 2021; Omodero, 2019; Chinanuife, Eze & Nwodo, 2018; Akomolafe, Bosede, Emmanuel & Mark, 2015), as predominantly postulated by debt overhang theory. Public debt is considered undesirable for economic investment due to its potential to increase interest rates, making it more expensive for businesses to borrow money for investments, reducing private sector spending on capital projects and hindering economic growth, despite its potential to stimulate private investment under certain conditions (Were & Madete, 2022; Abubakar & Mamman, 2021; Kengdo, Ndeffo & Avom, 2020), thus, echoing the Keynesian view. Government spending on infrastructure projects boosts demand for goods and services, boosting business activity and investment. Policies promoting fiscal stability and sound macroeconomic management boost investor confidence and resource allocation.

Previous studies have contradicted views on the impact of public debt on investment, indicating a need for a comprehensive understanding. This study focuses on the domestic debt component of public debt, using the Autoregressive Distributed Lag (ARDL) technique to examine the long-run and short-run linear effects of domestic public debt on private investment.

So, the primary goal of this research is to investigate the impact of domestic public debt on private investment in Nigeria. The importance of this study cannot be overstated. This analysis demonstrates the volume and type of the impact that domestic public debt may have on private investment. As a result, it will serve as a guideline for the government's borrowing strategies, as well as for foreign investors making direct investment decisions. It will improve the current literature on public debt and private investment in emerging nations and give references for future research due to the vacuum it will fill, as noted in the problem description.

The study evaluates the impact of domestic public debt on private investment spending in Nigeria from 1981 to 2022, covering a 42-year period. The researchers aimed to assess the long-term and short-term effects of domestic public debt decisions across different political regimes. They used secondary data from World Bank Development Indicators for Nigeria and the Central Bank of Nigeria, covering the period 1981 to 2022.

The rest of the study is segmented into five elements. Following this introduction is the literature review in segment 2. Thereafter, segment 3 will deal with data and the methodology that will be used for analysis in segment 4. The study is concluded with segment five that deals with discussion of findings, conclusion and recommendations.

2. Literature Review

2.1 Conceptual Review

Domestic public debt is the government's liabilities, collected from citizens, and can be classified into bank and non-bank borrowing categories (Havi & Enu, 2018; Obiwuru, Okwu & Ekezie, 2013). Bank loans are used by central bank governments to securitize liabilities, providing them to the public through government bonds, developed stocks, and bonds. The maximum duration of debt in Nigeria is one year, typically 3 to 12 months or 91 to 364 days. Domestic debt in Nigeria includes debt instruments issued by federal, state, and local governments, denominated in local currency, but excludes contractor debt, supplier loans, contingent debt, and inter-institutional debt (Anoke, Odo & Nnabu, 2021). Government borrowing from domestic sources is crucial for boosting investment and private savings, and strengthening domestic financial markets by providing liquidity. The increasing domestic debt can negatively impact the economy by limiting lending, raising interest rates, and reducing financial resources for the private sector. Even with interest rate regulation, selective crediting can crowd out private investment. According to Ogunjimi (2019) and Akomolafe, Bosede, Emmanuel, and Mark (2015), with thin financial markets, a dominant public sector, and poor debt management, increasing domestic debt would have a significant negative impact on available capital funds, interest rates, private investment, and, ultimately, economic growth. Three common explanations for government domestic debt include thin financial markets, poor debt management, and a dominant public sector (Krušković

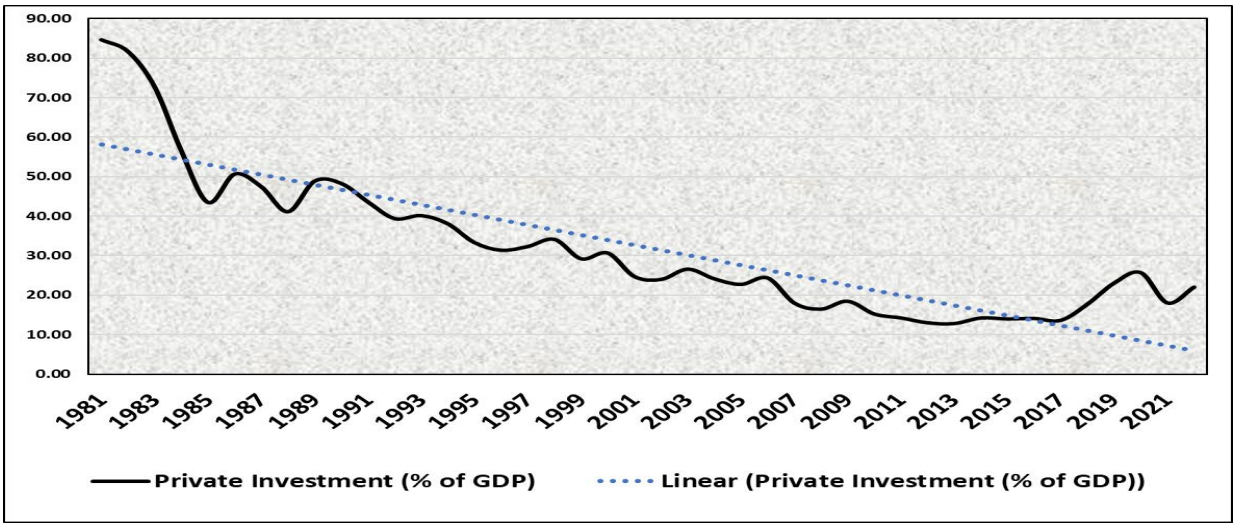
& Maričić, 2015). The three main areas of focus in intellectual discourse are budget deficit financing, monetary policy implementation, and developing financial market instruments. Domestic debt is often ignored or briefly mentioned due to its difficulty in repayment, but this is only true when domestic debt is not large and not detrimental to private spending and investments (Festus & Sabiu, 2019). This has a thing to do with private investment activities.

Private investment, from a macroeconomic perspective, involves purchasing a capital asset that is expected to generate income and appreciate in value (Enabulu & Epor, 2022). Domestic public debt impacts private investment differently across countries, particularly in developing sub-Saharan African countries with limited international capital market access, posing challenges in effective debt management (Kulu, Brafu-Insaidoo, Peprah & Bondzie, 2022). High public debt in developed countries can cause macroeconomic instability, currency depreciation, and reduced investor confidence, deterring private investment, while advanced economies with well-developed financial systems may manage debt more effectively (Vanlaer, Picarelli & Marneffe, 2021). Countries with diverse financing options often have the ability to mitigate the negative impacts of high public debt levels on private sector activities. Policymakers must balance fiscal sustainability through prudent public debt management with creating an environment conducive to private investment growth (Epor, Yua & Nwakoby, 2023). Implementing strategies like transparency, accountability, tax collection, resource allocation, and structural reforms can foster public debt sustainability and private sector growth.

The Nigerian government has implemented various policies to attract private investment, including strict monitoring of IMF policies. The liberalization of the economy welcomes foreign investors in manufacturing, offers incentives for equity ownership in all industries except military equipment, and provides tax relief and concessions for local raw material development. The Nigerian economy underwent significant changes in the 1990s, beginning with deregulation and subsequent policies like the Structural Adjustment Programme, Export Processing Zones Decree, and Investment Promotion Commission. These policies led to a significant increase in FDI inflows into the 21st century.

According to Figure 1, domestic private investment accounted for approximately 84.65% of GDP in 1981. The trend analysis found that private investment outperformed throughout the early stages of this investigation. Domestic private investment remained at 42.42% till 1990. By the year 2000, private investment had dropped to 27.27%. Domestic private investment continued to fall in 2010, following the trend. There is little question that domestic private investment has been dropping since the early 1980s, implying "deprioritization" of policies that promote private domestic investment growth. Inadequate infrastructure is a key issue that inhibits private investment in Nigeria.

Figure 1: Private Investment Performance in Nigeria

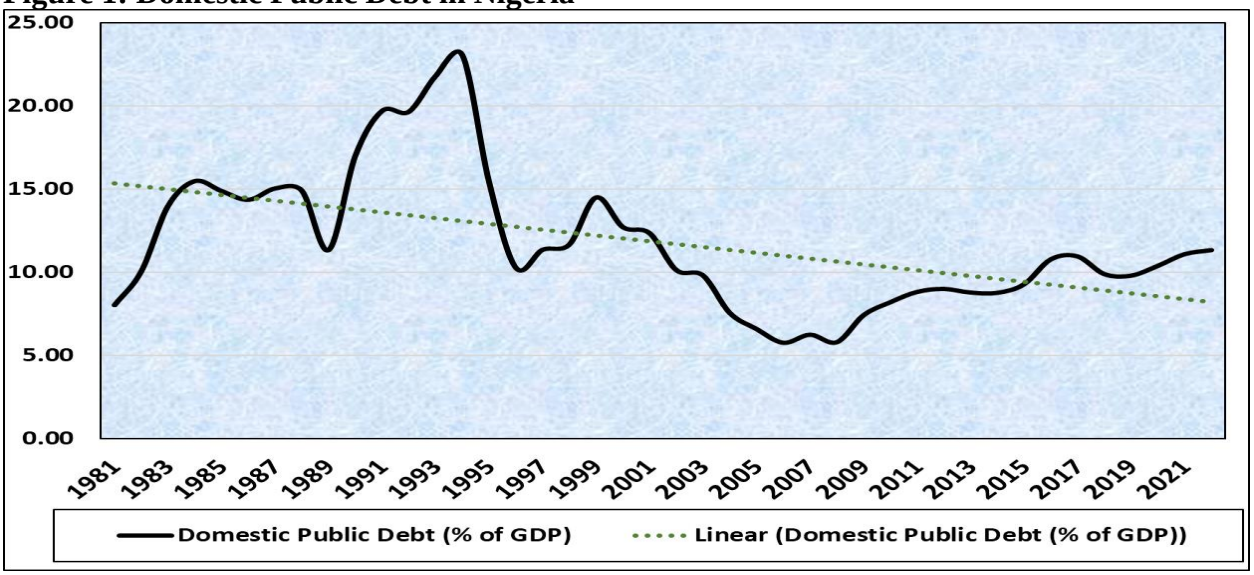


Source: World Bank, https://data.worldbank.org/country/NG

The country faces infrastructure deficits like poor road networks, unreliable power, inadequate water and sanitation, and limited healthcare and education services, causing increased operating costs, reduced productivity, and hindering economic growth, with private investors often burdened with the burden.

Nigeria's infrastructure is a significant obstacle to economic growth, hindering productivity and private investment. To finance infrastructure, the government relies on domestic borrowing through treasury bills and bonds. However, rising public debt levels have raised concerns about fiscal sustainability and the government's ability to finance critical infrastructure projects. The accumulation of domestic debt raises questions about its sustainability and economic implications.

Figure 1: Domestic Public Debt in Nigeria



Source: World Bank, https://data.worldbank.org/country/NG

In 1981, domestic public debt stood at 8.03% of GDP when compared to the peak level of 23.04% of GDP in 1994. Interestingly, the emergence of democratic reigns caused a declining domestic public debt from 14.50% in 1999 to 5.81% in 2008. From that appreciable low level in 2008, the domestic debt level has continuously trended upwards to 11.34% in 2022. Several explanations have been proposed to explain Nigeria's evolving domestic debt profile between the 1960s and the present (Asogwa & Ezema, 2005). The key factors include high budget deficits, low output growth, big expenditure growth, a high inflation rate, and a restricted revenue base that have persisted since the 1980s till 2022.

The management of domestic public debt is crucial for Nigeria's private investment, as it maintains macroeconomic stability, reduces interest rates, and creates fiscal space for private sector activities. This ensures business growth and contributes to economic growth. Sound debt management practices ensure efficient use of public resources, supporting sustainable development and prosperity. This attracts both domestic and foreign investments, which are essential for economic growth and development.

2.2 Theoretical Framework

The crowding out theory, originating from classical economic thought, suggests that government borrowing to finance spending would lead to higher interest rates, reducing private investment. This idea was further developed by economists like John Maynard Keynes and Milton Friedman in the 20th century. It gained prominence during the 1970s and 1980s, a period of high inflation and rising government debt levels. According to Kocha, Iwedi and Sarakiri (2021), the crowding out effect theory of public debt is valid, particularly when government securities replace capital stock in public asset portfolios.

In terms of domestic debt, crowding out theory says that as the government borrows more to support its spending, it competes with private borrowers for available money in the financial markets. This rivalry raises interest rates, making it more expensive for firms and people to borrow money for investments. As a result, private investment may fall, resulting in slower economic development and productivity (Olaifa & Benjamin, 2020). In Nigeria, where many enterprises and individuals already have restricted access to financing, crowding out effects can worsen pre-existing economic issues. High interest rates caused by greater government borrowing might discourage private-sector investment, which is critical for job creation, innovation, and general economic progress. As a result, regulating public debt levels becomes vital to minimize crowding out effects and create a favorable climate for private sector growth.

Domestic public debt in Nigeria has caused major worry owing to its influence on fiscal sustainability and macroeconomic stability. High levels of public debt can cause debt payment expenses to consume a significant amount of government revenue, restricting resources available for critical public services such as healthcare, education, and infrastructure development. Furthermore, excessive dependence on borrowing can damage investor confidence, resulting in increased borrowing rates and possible financial instability.

2.3 Empirical Review

Epor, Steve, Henry, and Nwakoby's (2023) study looks at the influence of government debt on private investment in Nigeria between 1990 and 2019. According to the NARDL model, changes in foreign debt influence private investment positively in the long run and adversely in the short run, whereas domestic and foreign debt shocks have immediate beneficial effects. Hamadou, Nourou, Oumarou and Zakariyaou (2022)'s study found that public debt in Sub-Saharan Africa reduces private investment due to credit rationing and higher taxes for debt services, using various methods and a panel of 43 countries from 2000-2018. Kulu, Brafu-Insaidoo, Peprah and Bondzie (2022)'s study found that government domestic payment arrears negatively impact private investment in 33 Sub-Saharan African countries from 2007 to 2018, using panel GMM estimation technique.

Were and Madete (2022)'s study examined the correlation between public debt and investment in Tanzania using the autoregressive distributed lag approach. Results showed that increased debt boosts public investment, but external debt accumulation's long-term lagged effect is negative. Enabulu and Epor (2022) utilized the ARDL technique to analyze domestic private investment determinants in Nigeria, finding that economic output and private sector credits significantly influences domestic private investment. Abubakar and Mamman (2021) investigated the impact of state debt on private investment in Nigeria. The linear and non-linear ARDL models are used to examine the series from 1981 to 2018. The estimation findings reveal that a rise in overall debt, external debt, and debt service payment negatively impacts private investment, and the effects are symmetric. Anoke, Odo and Nnabu (2021) analyzed the correlation between public debt and domestic private investment in Nigeria from 1980-2018, revealing a significant negative impact of domestic debt.

Ebhotemhen (2020) study confirms the expansionary effect of the Debt-Export Ratio on investment in Nigeria from 1981 to 2018, using the Vector Error Correction Model. Fagbemi and Adeosun (2021) analyzed the long-term relationship between public debt and domestic investment in 13 West African countries from 1986-2018. Results showed that debt and external debt had minimal impact on investment levels, suggesting a negligible impact of public debt. Kengdo, Ndeffo and Avom (2020) examined the impact of external debt on domestic investment in sub-Saharan Africa from 1980-2017 using the Generalized Method of Moments, finding that external debt positively impacted domestic investment, accounting for 74.33% of GDP. Lau, Tan and Liew (2019) found that in Malaysia, higher public debt crowds out private investment in both long-run and short-run terms, aligning with the crowding-out effect theory, using non-linear autoregressive distributed lags estimation data from 1980 to 2016.

Ogunjimi (2019) analyzed the impact of public debt on investment in Nigeria from 1981-2016 using the Autoregressive Distributed Lag framework. Results showed that domestic debt improves private and public investments, while external debt crowds private investments in both short and long terms. Chinanuife, Eze and Nwodo (2018) used the ARDL methodology to analyze the impact of public debt on Nigeria's public investment, revealing a significant negative trend from 1981 to 2016, with public debt causing a significant decrease in public investment. Ncanywa and Masoga (2018) examined the impact of public debt on public investment and economic growth in South Africa from 1995 to 2016, using various methods, and found a long-term negative relationship between public debt and investment.

Thilanka and Ranjith (2018) analyzed Sri Lanka's public debt impact on private investment from 1978-2015, using data from 1978-2015. It found a crowding-in effect in the long run, while real GDP positively impacted private investment. Akomolafe, Bosede, Emmanuel and Mark (2015) The study analyzed the impact of public borrowing on private investment in Nigeria from 1986 to 2005, revealing that domestic debt impedes domestic investment.

The literature indicates a strong relationship between public debt factors and investment, but the measure for investment varies. This study addresses a gap in previous studies by developing a comprehensive model to account for all associated variables with domestic public debt, including GDP, inflation, private credit, tax revenue, and government expenditure. The study will also include the response of private investment from domestic public debt and associated variables using the Autoregressive distributed lag (ARDL) model.

3. Data and Methodology

The study uses an ex post facto research design to analyze investment activities in Nigeria influenced by public debts from 1981-2022. This design is chosen to capture trends in private and public investment in Nigeria. The study relies on quantitative secondary data from World Bank Development Indicators for Nigeria and the Central Bank of Nigeria statistical bulletin. Regression models will be formulated using foundational theories and empirical studies to explain the relationships between public debt and investment. The research aims to determine the extent to which public debt affects investment in Nigeria.

Model Specification

Based on the theoretical framework, this study will modify the crowding out theory to become:

$$INV = f(public\ debt, GDP)$$

$$INV = f(pd_t, GDP)$$

$$PI = f(pd_t, GDP) \quad (3.1)$$

Where, pd_t is public debt at time t

To estimate the relationship between investment and public debt in Nigeria, this study will follow similar studies in the literature that account for the effect of domestic debt, *dmd* (Epor, Ibenta, Yua & Nwakoby, 2023; Anoke, Odo & Nnabu, 2021; Nshimirimana, Léonidas & Biao, 2021; Ogunjimi, 2019; Lau, Tan & Liew, 2019).

The indicators of GDP, real interest rates, inflation rate, credit to the private sector are empirical variables relevant to determining investment. Following this, the study will adopt the model used by Epor, Ibenta, Yua and Nwakoby (2023), Anoke, Odo and Nnabu (2021), Ogunjimi (2019), and Akomolafe, Bosede, Emmanuel and Mark (2015) on the relationship between private investment and domestic debt that accounts for the effects of GDP and interest rates, credit to the private sector (Lau, Tan & Liew, 2019) and inflation rate (Omodero, 2019). Domestic public debt is a derived decision, as governments borrow to increase expenditures due to insufficient taxes and savings (Fagbemi & Adeosun, 2020). Modeling investment without government spending and taxes, as well as the implications of interest rates and inflation, is misspecification and may lead to misinterpretation.

$$PI = f(dmd, GDP, gvx, txr, int, inf, cps) \quad (3.2)$$

Where,

PI = private investment
dmd = domestic debt
int = interest rate
GDP = gross domestic product
gvx = government expenditure
txr = tax revenues
int = interest rate
inf = inflation rate
cps = credit to the private sector

Technique of Analysis: Autoregressive Distributed Lag (ARDL) Method

The study aims to estimate a model involving private domestic investment as the dependent variable, considering factors like aggregate demand/GDP, government spending, tax revenues, inflation, private sector credits, output, and interest rate as control variables. The Autoregressive

Distributed Lag (ARDL) technique, as suggested by Pesaran, Shin and Smith (2001), will be used to estimate parameters, with preliminary tests like unit root and cointegration tests conducted.

The study used the ARDL bounds testing approach to examine the long-run cointegration relationship among variables. This flexible model, developed by Pesaran, Shin, and Smith (2001), suggests a meaningful long-run relationship between two variables. The bounds testing technique involves estimating the following equation:

$$\begin{aligned}\Delta PI = {} & \alpha_0 + \alpha_1 PI_{t-i} + \alpha_2 dmd_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 gvx_{t-i} + \alpha_5 txr_{t-i} + \alpha_6 inr_{t-i} + \alpha_7 inf_{t-i} \\ & + \alpha_8 cps_{t-i} + \sum_{i=1}^{a} \beta_i \Delta PI_{t-i} + \sum_{i=0}^{b_1} \partial_j \Delta dsv_{t-j} + \sum_{i=0}^{b_2} \varphi_k \Delta GDP_{t-k} \\ & + \sum_{i=0}^{b_3} \theta_l \Delta gvx_{t-l} + \sum_{i=0}^{b_4} \omega_m \Delta txr_{t-m} + \sum_{i=0}^{b_5} \pi_n \Delta inr_{t-n} + \sum_{i=0}^{b_6} \rho_p \Delta inf_{t-p} \\ & + \sum_{i=0}^{b_7} \emptyset_q \Delta cps_{t-q} + \mu_t \end{aligned} \quad (3.3)$$

where, the terms associated with the summation signs in the above models above (ie, β_i, ∂_j, φ_k, $\theta_l, \omega_m, \pi_n, \rho_p, \emptyset_q$) represent the short-run dynamic coefficients; whereas $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8$ are the long-run coefficients, and are the optimum lag lengths and is the white noise error term. In this study, the appropriate lag order of each series of the ARDL model is determined using the Akaike information criterion (AIC).

The hypothesis of the bounds test is specified as:

$$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8$$

$$H_1: \alpha_1 \neq \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq \alpha_7 \neq \alpha_8$$

Pesaran, Shin, and Smith (2001) suggest three possible decisions from the ARDL bounds test using the Wald test (F-statistic): accepting the null hypothesis of no cointegration if the F-statistics are below the lower bound critical value, rejecting the null hypothesis if the F-statistics exceed the appropriate upper bound critical values, or remaining inconclusive.

Long-run and Short-run ARDL Estimation

Once cointegration is established between domestic debt and private investment, the conditional ARDL long-run model can be estimated as specified:

$$\begin{aligned}\Delta PI = {} & \alpha_0 + \alpha_1 PI + \alpha_2 dmd_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 gvx_{t-i} + \alpha_5 txr_{t-i} + \alpha_6 inr_{t-i} + \alpha_7 inf_{t-i} \\ & + \alpha_8 cps_{t-i} + \in_t \end{aligned} \quad (3.4)$$

Where,

ω_0 = intercept

α_1–α_8 = coefficients of long-run estimates

$\in_t$ = error term of long-run estimates

In the next step, we will obtain the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. This is specified as follows:

$$\Delta PI = \alpha_0 + \sum_{i=1}^{a} \beta_i \Delta\, PI_{t-i} + \sum_{i=0}^{b_1} \partial_j \Delta\, dsv_{t-j} + \sum_{i=0}^{b_2} \varphi_k \Delta\, GDP_{t-k} + \sum_{i=0}^{b_3} \theta_l \Delta\, gvx_{t-l} + \sum_{i=0}^{b_4} \omega_m \Delta\, txr_{t-m} + \sum_{i=0}^{b_5} \pi_n \Delta\, inr_{t-n} + \sum_{i=0}^{b_6} \rho_p \Delta\, inf_{t-p} + \sum_{i=0}^{b_7} \emptyset_q \Delta\, cps_{t-q} + \propto ECT_{t-1} + \psi_t \quad (3.5)$$

Where,

ECT = error correction term derived from equation (3.5), and

$\propto$ = the speed of adjustment.

ψ_t = error term of the short-run model

The error correction model shows the speed of adjustment needed to restore the long-run equilibrium following a short run shock. The $\propto$ is the coefficient of the error correction term in the model and must be negative and significant for the return back to long-run equilibrium to hold (Pesara, Shin & Smith, 2001).

4. Analysis and Results

The data were sourced from the Central Bank of Nigeria (CBN) and World Bank database for Nigeria from 1981 to 2022. The dependent variables is private investment (PI). The independent variable is domestic debt (DMD), while the control variables are GDP growth rate, total government revenues, total government expenditures, inflation and private sector credits in Nigeria are coded GDPG, GVR, GVX, INF and CPS.

The data used in the research have been summarized in table 1, using descriptive analysis in the form of mean, standard deviation, minimum and maximum. The number of observations (42) represent the years covered by the study. The mean of investment data for private investment was 32.01% of GDP. An economic activity that possesses this level potentials has the ability to drive the Nigerian economy to sustainable growth and development. Again, the mean of domestic debt stock was 11.76%. The means of private sector credit and inflation was 11.66% and 18.92%, while those of government revenues and aggregate spending was 13.11% and 8.38%, respectively.

Table 1: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Observations
PI	32.011	26.143	84.648	12.801	18.057	1.287	4.309	42
DMD	11.763	10.869	23.043	5.772	4.169	0.914	3.408	42
GDPG	3.012	3.424	15.329	-13.128	5.323	-0.811	4.702	42
GVR	13.107	12.431	27.101	5.475	6.030	0.609	2.480	42
GVX	8.378	8.068	17.286	5.089	2.508	1.571	6.024	42
INF	18.915	12.942	72.836	5.388	16.456	1.882	5.450	42
CPS	11.659	8.099	22.755	5.806	5.594	0.614	1.606	42

Source: Author's Computation from sourced data

The standard deviation information implies that private investment variable, with standard deviation of 18.65%, exhibited more volatility than all the other variables included in the study. The statistics of skewness which is a measure of asymmetry of the distribution of the series around its mean indicated that all the variables, except economic growth, were positively skewed, implying that these distributions have long right tails. Also, the Kurtosis which measures the peakedness or flatness of the distribution of the series revealed all the variables of the study were leptokurtic, suggesting that the distribution is more peaked at the top relative to the normal.

Correlation Analysis

The coefficients shown in the Pearson Correlation Coefficient matrix in table 4.2 indicates the strength of the linear relationship between the variables. From the Pearson Correlation Coefficient Matrix in table 2, it is observed that the correlation coefficients between private investment was found to be positively related with domestic debt, inflation, and government expenditures. There was also negative relationship between private investment and GDP growth, government revenue and private sector credits.

Table 2: Correlation analysis of variables for Nigeria

	PI	**DMD**	**GDPG**	**GVR**	**GVX**	**INF**	**CPS**
PI	1						
DMD	0.390	1					
GDPG	-0.630	-0.240					
GVR	-0.180	-0.030	0.470	1			
GVX	0.210	0.500	0.060	0.500	1		
INF	0.200	0.540	-0.210	0.020	0.220	1	
CPS	-0.660	-0.430	0.130	-0.370	-0.490	-0.280	1

Source: Author's Computation from sourced data

Correlation analysis helps identify variables with strong linear relationships or similar characteristics, indicating which should be dropped for near perfect correlation. A linear relationship of ± 0.80 indicates a strong linear relationship, so no variable should be dropped. To tackle multicollinearity, the core independent variables (domestic debt, external debt, debt service, and fiscal deficit) will be separated, as proposed in section three.

Stationarity Tests:

The ARDL models don't require pre-testing for unit root problems, as they can accommodate I(0) and I(1) variables or mutually cointegrated variables. However, they don't accommodate series of order 2, necessitating unit root tests (Epor, et al, 2023). The order of integration of time series was investigated using the Augmented Dickey and Fuller test.

Table 3: Stationarity Tests at Levels and First Difference

Variables	ADF Tests: Levels		ADF Tests First Difference		Order of Integration
	ADF Test Statistic	p-values	ADF Test Statistic	p-values	
PI	-3.8181	0.0056***			I(0)
dmd	-2.1523	0.2263	-5.1086	0.0001***	I(1)
gdpg	-3.1852	0.0283**			I(0)
gvx	-1.9078	0.3255	-10.3556	0.0000***	I(1)
gvr	-2.1428	0.2297	-5.9858	0.0000***	I(1)
cps	-1.0317	0.7329	-5.9130	0.0000***	I(1)
inf	-3.0488	0.0387**			I(1)

*, **, *** are significance at 10%, 5% and 1%

Source: Author's Computation from sourced data

The ADF tests represented in table 3 rejected the null hypothesis of the presence of unit root at levels for private investment, economic growth rate, inflation, and so PI, GDPG, and INF series were integrated of order zero, that is *I*(0). On the other hand, the ADF test fails to reject the null hypothesis of no unit root for domestic debt, aggregate government expenditure, government revenues, and private sector credits at levels. However, they became stationary at first difference, making them integrated of order one, that is *I*(1).

It has been established by Pesaran, Shin and Smith (2001) that the bounds technique allows a mixture of I(1) and I(0) variables as regressors. Based on this ground, we proceed to perform the ARDL bounds test for cointegration.

ARDL Bounds Test for Cointegration

In this section, we proceed to investigate long-run cointegration, where private investment is tested as the dependent variable. The calculated F-statistics report is in Table 4. The estimated F-statistics of the ARDL bound testing to be compared with the critical value proposed by Pesaran, Shin and Smith (2001).

Table 4: ARDL Bounds Tests for domestic public debt-private investment model

F-statistic	21.38671	5% Upper Bound Value	Decision
Sig. level	5%	3.62	Reject H0

The study observed all the F-statistics in the domestic debt-private investment model (that is, 21.38671 > 3.62) was greater than the computed upper bound of critical values from the linear ARDL bounds tests. It signifies the existence of long-run cointegration in the models involving private investment and domestic public debt. So, one can conclude that domestic debt has long-run relationships with private investments for the period 1981-2022, when government spending, government revenues, private sector credits and inflation are accounted for.

ARDL Long-run Model Estimation

In the model involving domestic public debt and private investment, the individual country's lag selection criteria based on Akaike model selection are defined as:

Private investment-domestic debt - ARDL - (1, 3, 3, 4, 4, 4, 1)

Based on the lag specification of the ARDL lags, the long run model is given as:

$$PI = 1.32 * DMD - 1.47 * CPS + 0.31 * GDPG + 0.26 * GVR - 3.87 * GVX + 0.36 * INF + 0.12 * @TREND$$

From the model estimation above, the coefficient of domestic debt stock, economic growth, government revenues, and inflation were shown to be positive. It was observed that the coefficient of private sector credit was negative, meaning that increasing debt of government drains away the funds available for the private sector.

Short-run and Long-run ARDL-Error Correction Models

The study confirms long-run relationships and estimates error correction terms, which must be negative and statistically significant. Based on the bounds test, the study estimates short-run ARDL-ECM models for all eight domestic public debt-investment models in Nigeria. The adjusted R-squared value indicates that changes in domestic debt and ECT variables account for 95.26% of changes in the domestic debt-private investment model. The F-statistics are significant at 1% (ie,

p=0.0000), indicating that all domestic debt and control variables are significant in explaining private investment performances in Nigeria. The Durbin-Watson statistic value of 2.2889 indicates that the model is free of first order serial correlation.

As shown in Table 5, the error correction model coefficients in Nigeria's domestic debt-private investment model revealed the expected negative coefficient, which is statistically significant at the 1% significance level (ie, p = 0.0000). This conclusion implies that there is considerable error occurring, as well as a correction of the error to long-run equilibrium in the prior eras. The domestic debt-private investment model fixed around 93.67% of the errors that had occurred in previous years.

Table 5: The ARDL-ECM for domestic debt-investment model

ARDL ECM Estimates			ARDL Long-run Estimates		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
C	43.8377	0.0000***	DMD	1.3203	0.0014***
D(DMD)	0.4863	0.0086***	CPS	-1.4760	0.0000***
D(DMD(-1))	-0.1374	0.3391	GDPG	0.3115	0.2698
D(DMD(-2))	0.1379	0.1489	GVR	0.2663	0.4147
D(CPS)	-0.3954	0.0019***	GVX	-3.8719	0.0001***
D(CPS(-1))	0.7712	0.0001***	INF	0.3612	0.0000***
D(CPS(-2))	0.3815	0.0072***	@TREND	0.1280	0.1655
D(GDPG)	0.0623	0.3481			
D(GDPG(-1))	0.7087	0.0000***			
D(GDPG(-2))	1.1000	0.0000***			
D(GDPG(-3))	0.6258	0.0000***			
D(GVR)	0.2979	0.0022***			
D(GVR(-1))	0.4670	0.0001***			
D(GVR(-2))	0.3861	0.0001***			
D(GVR(-3))	0.2871	0.0001***			
D(GVX)	-0.0883	0.5081			
D(GVX(-1))	3.8120	0.0000***			
D(GVX(-2))	2.3585	0.0000***			
D(GVX(-3))	0.6171	0.0038***			
D(INF)	0.0688	0.0050***			
ECT(-1)*	-0.9367	0.0000***			
Adjusted R-squared	0.9526				
Prob(F-statistic)	0.0000				
Durbin-Watson stat	2.2889				

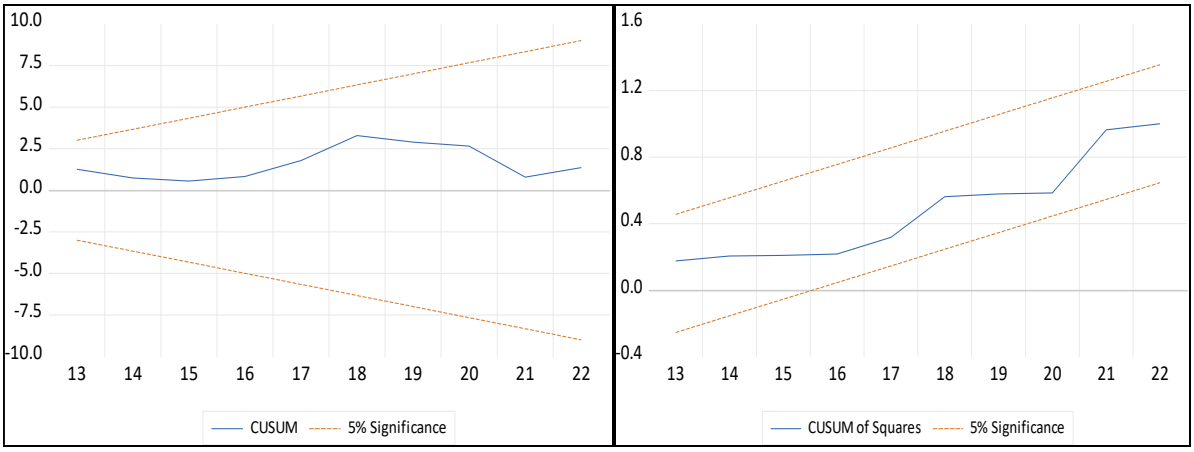
*, **, *** are significance at 10%, 5% and 1%

Table 5 shows that government domestic debt has a statistically significant positive effect (β = 1.32) on private investment in Nigeria from 1981 to 2022, as indicated by a p-value of 0.0014, which is less than the significance level (0.05). Thus, the null hypothesis that government domestic debt has no substantial influence on private investment in Nigeria is rejected since the positive coefficient of government domestic debt is significant.

Model Stability and Diagnostic Tests

The CUSUM and CUMSUMQ stability test were used to ascertain the stability of the residuals in the system of models adopted. In this respect, the cumulative sum of Recursive Residuals (CUSUM) and the cumulative sum of squares (CUMSUMQ) of Recursive Residuals are used to assess residual stability.

Figure 3: CUSUM and CUMSUMQ in the domestic debt-private investment model



The first CUSUM and CUMSUMQ tests were done for the domestic debt-private investment model (figure 3). Since the CUSUM and CUMSUMQ lines in figure 3 are between the five percent (5%) lines, it indicates the stability of the residuals. So, we conclude that the domestic debt-private investment model in Nigeria indicates residual stability.

To ensure the validity of the estimates of the parsimonious models above, tests to verify the extent of the affirmation or violations of the assumptions of Least Squares estimates (of which the ARDL is part of) were carried out. They include the Breusch-Godfrey Serial Correlation LM, Heteroscedasticity and Jarque-Bera Normality tests.

Table 6: Diagnostic Tests

Test statistics	p-values	Decision
Jarque-Bera test for Normality	0.0707	Nomarlly distributed
Breusch-Godfrey Breusch-Godfrey Serial Correlation LM Test	0.1223	No serial correlation
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.9353	Homoskedastic distribution

Source: Researcher's Computation using EViews

Since the p-values of the Jarque-Bera statistics for the domestic public debt-private investment model is greater than 0.05 (ie, 0.0707 > 0.05), we conclude that there is no statistical evidence of the presence of no normality in the domestic public debt-private investment models for Nigeria. Similarly, as the p-values of the Breusch-Godfrey Serial Correlation LM test statistics for the domestic public debt-private investment models is greater than 0.05 (ie, 0.1223 > 0.05), we conclude that there is no statistical evidence of the presence of serial correlation in the domestic public debt-private investment model for Nigeria. Finally, as the p-values of the Breusch-Godfrey Serial Correlation LM test statistics for the domestic public debt-private investment model is greater than 0.05 (ie, 0.9353 > 0.05), we conclude that there is no statistical evidence of the presence of heteroskedasticity in the domestic public debt-private investment models for Nigeria.

4.5 Discussion of Findings, Conclusion and Recommendation

Discussion of Findings

The research aimed to investigate the effects of government domestic debt on private investment in Nigeria. The findings revealed that the null hypothesis that government domestic debt has no meaningful influence on private investment in Nigeria is rejected due to the substantial positive coefficient. This conclusion is consistent with that of Abubakar and Mamman (2021), who discovered that domestic public debt buildup has no detrimental impact on private investment in Nigeria, and Kengdo, Ndeffo, and Avom (2020), who hypothesized that domestic debt had a positive impact on investment. All of this supports the crowding-in effect idea. Similarly, Ogunjimi (2019) stated that domestic debt attracts both private and public investment. In contrast, Lau, Tan, and Liew (2019) found that increased public debt crowds out private investment, which is consistent with the crowding-out effect theory. According to the findings of this study, a spike in government expenditure might be the reason for the government's domestic debt crowding-in the private sector since it can drive an increase in domestic economic activity and hence crowds in private investment (Ncanywa & Masoga, 2018).

In the instance of Nigeria, it is not quite clear if mounting government domestic debts drive a crowding-out effect in the private sector. Nigeria's government is the single largest economic agent. First and foremost, the Nigerian budget determines the direction of the private sector. This is because the government is the most important consumer for the majority of private investors

and firms. The government makes purchasing and spending choices from and for the private sector. Second, the government is the greatest employer of people in the country. The government's domestic debt instrument, the Treasury Bill, is the safest and most preferred portfolio investment instrument, and large blue-chip corporations that invest excess cash in Treasury bills eventually treat this as a net of their investment activities in their cash flow statements. The working class, which is accountable for income, is the most fundamental part of private consumption that drives private investment.

Conclusion

This study examined the effect of public debt on investments (private and public) in Nigeria for the long-run period of 1981 to 2022. The study examined a number of significant public debt variables that are difficult to neglect when trying to understudy the effects of public debt. The variable is government domestic debt (DMD). The control variables, which are GDP growth rate, total government revenues, total government expenditures, inflation and private sector credits in Nigeria are coded GDPG, GVR, GVX, INF and CPS. The result of the study showed that government domestic debt boosted private investment. In all, private investments has benefitted more from domestic public debt. This means that domestic public debt crowd in more of private investments, all things being equal.

Recommendations

In line with the findings/conclusion made in this study, the following recommendations are put forward: The most concern drawn from the positive significance of government domestic debt is that its increases impedes private sector credits. As this is, it means that the complementary role of the monetary policy has not been seen. The CBN, in the face of increasing domestic public debt, should enhance policy directions to also increase private sector credits.

References

Abubakar, A. B., & Mamman, S. O. (2021). Effect of Public Debt on Private Investment in Nigeria: Evidence from an Asymmetric Dynamic Model. *Economic and Financial Review*, *59*(3), 59-86.

Akomolafe, K. J., Bosede, O., Emmanuel, O., & Mark, A. (2015). Public debt and private investment in Nigeria. *American Journal of Economics*, *5*(5), 501-507.

Anoke, C. I., Odo, S. I. & Nnabu, B. E. (2021). Public Debt and Domestic Private Investment: A Crowding Effect in Nigeria. International Journal of Research and Innovation in Social Science (IJRISS), 5(3), 1 – 8.

Asogwa, R. C., & Ezema, C. C. (2005). Domestic government debt structure, risk characteristics and monetary policy conduct, evidence from Nigeria. Final Research Project Submitted for the International Research Project on Macroeconomic Policy Challenges for Low Income Countries, 1-44.

Chinanuife, E., Eze, P. & Nwodo, O. S. (2018). Public debt spiral and domestic investment in Nigeria. *Academic Journal of Economic Studies*, 4(1), 153–161

Ebhotemhen, W. (2020). The effects of external debt and other selected macroeconomic

variables on investment in Nigeria. *Journal of Economics and Allied Research*, *5*(1), 91-105.

Ekpe, J. P. (2020). Impact Of External Debt on Economic Growth in Nigeria. *Social Sciences and Management International Journal*, 1(3), 62-77

Enabulu, O. G. & Epor, S. O. (2022). Determinants of Domestic Private Investment: Empirical: Evidence from Nigeria's Domestic Macroeconomic Variables. Igbinedion University Journal of Economics and Development Studies, IUJEDS, 1 (2), 81 – 99.

Epor, S. O., Ibenta, S., Yua, H. & Ityavyar, D. V. (2023). Money Market and Private Investment activities: Any Empirical Evidence of Causation and Causality from the Nigerian Banking Sector? Journal of Global Independence and Economic Sustainability, 2(3), 12-28

Epor, O. S., Ibenta, S. N., Yua, H. & Nwakoby, C. (2023), Domestic and Foreign Debt Dynamics and Nonlinear Effects on Private Investments in Nigeria: Evidence with Asymmetric ARDL and Causality. *African Journal of Accounting and Financial Research*, 6(2), 1-21.

Epor, S. O., Yua H., Nwakoby, C. (2023). Fiscal Policy, Private Investment and Manufacturing Sector Performance: Empirical Evidence from Nigeria with ARDL Technique. African Journal of Economics and Sustainable Development, 6(1), 137-151

Fagbemi, F., & Adeosun, O. A. (2021). Public debt-investment nexus: the significance of investment-generation policy in West Africa. *Journal of Economic and Administrative Sciences*. Working Paper Series No. 221

Festus, G. E. & Sabiu, M. O. (2019). Effect of external debt on Nigerian economy: further evidences. Available at https://mpra.ub.unmuechen.de/id/eprint/92704

Hamadou, A., Nourou,M., Oumarou, M. & Zakariyaou (2022).Public Debt and Private Investment in Sub-Saharan Africa. *Global Journal of Human-Social Science: E Economics*, 22(1), 61 – 74.

Havi, E. D. K.& Enu, P. (2018). The effect of money supply and monetary policy on Ghana's Economic growth: Which policy is more potent? *International Journal of Empirical Finance*, 3(2), 61-75.

Kengdo, A. A. N., Ndeffo, L. N., & Avom, D. (2020). The effect of external debt on domestic investment in sub-Saharan African sub-regions. *Economic Research Guardian*, *10*(2), 69-82.

Kocha, C. N., Iwedi, M., & Sarakiri, J. (2021). The Dynamic Impact of Public External Debt on Capital Formation in Sub-Saharan Africa: The Pooled Mean Group Approach. *Journal of Contemporary Research in Business, Economics and Finance*, *3*(4), 144-157.

Krušković, B. D. & Maričić, T. (2015). Empirical Analysis of the Impact of Foreign Exchange Reserves to Economic Growth in Emerging Economics. *Applied Economics and Finance*, 2(1), 102-109.

Kulu, E., Brafu-Insaidoo, W. G., Peprah, J. A., & Bondzie, E. A. (2022). Government domestic debt arrears and private investment in Sub-Saharan Africa. *African Journal of Economic and Management Studies*, *13*(2), 190-204.

Ncanywa, T., & Masoga, M. M. (2018). Can public debt stimulate public investment and economic growth in South Africa? *Cogent Economics & Finance*, *6*(1), 1516483.

DOI: 10.1080/23322039.2018.1516483
Obiwuru, T. C., Okwu, A. T. & Ekezie, J. O. (2013). Effects of domestic debt on economic growth of Nigeria. Journal of Strategic and Int'l. Studies, 4(1): 44-60.
Ogunjimi, J. (2019). The impact of public debt on investment: Evidence from Nigeria. *DBN Journal of Economics & Sustainable Growth*. Available at SSRN: https://ssrn.com/abstract=3466870
Olaifa, F. G., & Benjamin, O. O. (2020). Government Capital Expenditure and Private Sector Investment in Nigeria: Co-integration Regression and Toda-Yamamoto Causality Analysis. *Advanced Journal of Social Science*, *6*(1), 71-82.
Omodero,C.(2019).External Debt Financing and Public Capital Investment in Nigeria: A Critical Evaluation. *Economics and Business*,33(1), 111-126.
Pesaran, M. H., Y. Shin., and Smith R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289-326
Thilanka, H. & Ranjith, J. S. (2018). The impact of public debt on private investment: Sri Lankan Experience. *International Journal of Business and Social Research*, *8*(8), 1-10.
Vanlaer, W., Picarelli, M., & Marneffe, W. (2021). Debt and private investment: does the EU suffer from a debt overhang? *Open Economies Review*, *32*, 789-820.
Were, M., & Madete, L. (2022). *The link between public debt and public investment in Tanzania*. United Nations University World Institute for Development Economics Research. Available at: https://doi.org/10.35188/UNU-WIDER/2022/288-1