Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.14, No.16, 2023

Disaggregated Public Expenditure Patterns and Private Investment Outcomes in Nigeria

Samuel O. Fadare[1*] Olajide S. Oladipo[2]
1. Nigeria Sovereign Investment Authority, Maitama, Abuja, Nigeria
2. Department of Economics, Nile University of Nigeria, Plot 681, Abuja, Nigeria
* E-mail of the corresponding author: tfadare@nsia.com.ng

Abstract
This study sought to find out the extent of relationship (if any) between the short- and long-term effects of the disaggregated component of government expenditure on private investments. Using the Auto Regressive Distributed Lag (ARDL) model, the study determined that components of both recurrent expenditure and capital expenditure are significant determinants of the relationships with private investment in the long run only. The results indicates that there is a significant crowding-in effect between components of government expenditure and private investments in Nigeria. This is consistent with the Keynesian school, particular for Nigeria's economy which requires government to spend heavily in order to create the enabling environment for inflows of private investment while increasing aggregate demand and jobs. The study determined the optimal recurrent and capital expenditure models for the economy and also showed that lending rates inflation rates, exchange rates, and GDP growth rates, are significant determinants of private investments.
Keywords: ARDL, Capital Expenditure, Private Investment, Recurrent Expenditure
DOI: 10.7176/JESD/14-16-03
Publication date: October 2023

1. Introduction

There is a large body of work in empirical economics literature which demonstrate that expansionary fiscal policy reduces investment spending by the private sector through government continued demand for loanable funds and subsequent increases in lending rates (Mona, 2013, Makin, 2015; Iheonu and Nwakeze, 2016). Consistent with the Keynesian school of thought, there have been studies that have argued in favour of, or established support for increased public expenditure to stimulate economic activities in such areas as infrastructure that encourages private investors to increase investment levels in the economy (Alauddin, 2007; Abubakar and Mamman, 2020); other studies have aligned with the Classical school of thought and have argued that there is no need for government intervention in the economy as government intervention would more likely worsen the functioning of the economy. The Classical school also insist that lending rates are a function of savings and investment levels alone; this is also related to the pattern of expenditure in the economy (Mabula and Mutasa, 2019). The Loanable Funds theory adds the bank credit dimension to the savings and investment position of the Classical school as determinants of interest rates i.e. interest rate is used to determine the equilibrium in the loanable funds market such that the level at which the interest rate is in an economy dictates how much borrowing, savings, and investments to expect (Ohlin, 1937).

In specifying models to demonstrate crowding-in and crowding-out government expenditure effects, several previous studies have focussed on private investment outcomes as a function of government borrowings (Lidiema, 2017) or government debts (Piccarelli et al., 2019; and Abubakar and Mamman, 2021), or budget deficits (Looney, 1995; and Asogwa and Okeke, 2013); however, not all government expenditures are funded via borrowings as budgets may be balanced and solely funded from increased internally-generated tax and non-tax revenues. Previous studies have also predominantly been carried out using the Vector Autoregressive (VAR) model, Error Correction Model (ECM), and the Ordinary Least Square (OLS) methodology. According to Omitogun (2018), outcomes that have supported either the Keynesian or Classical school of theory have done so mainly because of the approach used for the previous studies. The author asserted that the "outlooks are based on the different approaches as well as the time frame used to make conclusions. The majority of the studies used the Vector Autoregressive (VAR) model and Error Correction Model (ECM), to analyze their findings" (p. 137).

Recent increases in government expenditure to stimulate the economy as a result of global pandemics and recessionary fears has rekindled the debate on the crowding out (or crowding in) effects of government expenditure on private investments (see Asogwa and Okeke, 2013; de Soyres, et al. 2022). Perhaps more worrying is the state of the country's budget deficit which now appears to be running out of control. Umaru (2017) found that the Nigerian government seemed to be one of the highest employers of skilled and semi-skilled labour, with this (and other reasons) leaving authorities at all levels of public governance with rising administrative cost at the expense of developmental projects (Umaru, 2017).

Nigeria has been consistently running annual budget deficits for about 25 years with CBN (2022) reporting that from a budget deficit of ₦5 billion in 1997, total accumulated budget deficit stood at over ₦7.1 trillion at the

end of 2021. In addition, CBN (2022) reported that over 78 per cent of the federal government budget went into recurrent spending, and while the total government expenditure in 2021 stood at N11.667.63 trillion, only ₦2.52 trillion was actually voted for capital expenditure. Omitogun (2018) argued that in general, the effects of government expenditure on private investments is a function of the pattern of government public expenditure (p.136). This suggest that while total expenditure is rising and recurrent expenditure appears to predominate total expenditure, this may not necessarily be a negative thing for the economy. It also implies that while some types of government expenditure will discourage private investments in the economy, other types of government expenditure will attract private investments into the economy.

If that is the case, it is important to be able to identify the different components of government expenditure in the Nigerian economy and then determine which of these components encourage (crowd in) private investments, and which components discourage (crowd out) private investments in the Nigerian economy. While empirical economic literature is replete with investigations into crowding in and crowding out effects of government expenditure across different economies of the world (Furceri and Sousa, 2009; Ahmed and Miller, 2007), there has been very little done in this area for the Nigerian economy. For example, a search through the open contents on the JSTOR database using the following keywords: "Nigeria crowding out" and filtering for journals only, found 38 results. When this is further filtered down to the subject of Economics, only, we are left with only 2 journals.

No firm or individual has a better credit rating in the country than the federal government; therefore, rather than make use of market lending rates (Abubakar and Mamman, 2021) or maximum lending rates (Omitogun, 2018), this study uses the prime lending rate as one of its control variables. Tule et al. (2015) defined prime lending rate as:

> interest rate charged by banks to their largest, most secure, and most creditworthy customers on short-term loans (This rate is used as a guide for computing interest rates for other borrowers) while the maximum lending rate refers to interest charged by banks for lending to customers with a low credit rating (p. 8).

This study uses an Autoregressive distributed lag (ARDL) methodology because of the many advantages that this approach has over other approaches. An autoregressive distributed lag (ARDL) model is an ordinary least square (OLS) based model which is applicable for both non-stationary time series as well as for times series with mixed order of integration (Pesaran et al., 1999). ARDL can be applied irrespective of (0) or I (1) variables (Oskooee and Oyolola, 2007). ARDL is a more statistically significant approach for determining cointegrating relationships in small samples (Ghatak and Siddiki 2001). Further, other cointegration techniques require all of the regressors to be integrated of the same order, the ARDL can be applied whether the regressors are I (1) and/or I (0), i.e. whether the results are all unit root or all stationary or, indeed, even if mixed results are obtained (Pesaran, et al. 2001). Finally, ARDL take a wide range of numbers of lags that are captured in the data generating process especially in a more (McCann et al., 2010).

In addition to ARDL, this study also makes use of Vector Autoregressive (VAR) and the Bounds test. The VAR models will be run to examine the dynamic relationships that exist between all the variables as they interact with one another, this is in order to determine and select the optimum lag periods for the variables in our models as lag t-1 may not necessarily be the optimum lag period for all or some of the variables. Bounds tests will be carried out to determine whether the short-run models or long-run models or both are the best models to use for our analyses.

Using these methodologies within a 40-year timeframe (1981-2021), this study will disaggregate the federal government expenditure into its component parts and review both the short- and long-term effects of the component parts on private investments. In terms of the organisation of this study, the rest of the paper is structured as follows, following this introductory section, sections 2 and 3 presents a review of relevant theoretical and empirical literature respectively. Section 4 discusses the research methodology. The results are discussed in section 5, while a summary of the study outcomes, recommendations, and conclusion are presented in section 6.

2. Theoretical Literature

In economic literature, and as will be discussed in this section, there is no consensus on the relationship between the size or components of government expenditure and private investment. At one end of a spectrum, there is a school of economic thought – classical economic theory - which advocates for a free economy with very little or no government intervention in economic activities to influence economic growth (Smith, 1776). At the other extreme of the spectrum is another school of through – Keynesian economic theory – which believes that positive changes in government expenditures (consumption and investment components in national income remaining constant), will cause positive changes to national output (all other spending components remaining constant) (Keynes, 1936). A middle ground – the Ricardian Equivalence – explains that it really does not matter whether government borrows or increases tax to meet necessary public expenditures because governments must finance its expenditure one way or the other. (McCulloch, 1888).

Classical economic theory asserts that rising government expenditure aggravates a general decline in

economic activity as resources move from the private sector, which classical economists consider productive, to the public sector, which they consider nonproductive (Irvin, 2012). This theory was formalised by Adam Smith in 1776 through his seminal work An Inquiry into the Nature and Causes of the Wealth of Nations. Other classical economists that influenced this theory include Jean-Baptiste Say, David Ricardo, Thomas Robert Malthus, and John Stuart Mill. The shift of financial resources from the private sector to the public sector as a result of increased government expenditure is referred to as crowding out (Taylor, 2017). This phenomenon arises because when the government requires to increase spending beyond its tax and non-tax revenues, it approaches financial institutions or the capital markets for loans or other forms of financing (Majumder, 2007). This action reduces the amount of funding available to the private sector and also causes interest rates to rise. By its borrowing activities, the government causes borrowing to become more expensive and has reduced the amount of funds available for the private sector in the market, thus, "crowding out" private investment (Mabula and Mutasa, 2019). The crowding out of private investment could subsequently limit economic growth (Irvin, 2012).

Neoclassical economists therefore assert that any enlargement of public expenditure, particularly through borrowings, while it will increase consumption, it may end up decreasing wealth and investments (Phelps, 2022). According to Phelps (2022), “in neoclassical theory, this results in a period of slowdown of capital accumulation and productivity growth. That appears to be the neoclassical “take” on the consequences of an increase in the public debt” (p. 2). Alan Greenspan (2002), the former chairman of the US Federal Reserve is a well-known neoclassical advocate has argued that larger deficits really do raise interest rates and that what is best for the economy and for growth is in a more passive fiscal policy approach, low tax rates and limited government spending designed to promote economic growth by allowing the private sector, and thus the economy as a whole, to flourish.

The Great Depression of the 1930s that resulted in chronic unemployment and low levels of national output convinced economists that the classical theory of national income was inadequate (Keynes, 1936). This failure gave rise to the Keynesian economic theory which disagreed with the classical economic school of thought and instead, viewed the determination of economic growth in terms of increased government intervention to stabilize the economy. In his book the General Theory of Employment, Interest and Money, Keynes (1936) hypothesised that levels of national income and employment are determined by a country’s aggregate demand and aggregate supply; and that equilibrium national income occurs at the point where aggregate demand, represented by consumption and investment expenditure, is equal to aggregate supply, represented by national income at factor cost. Keynes 91936) further argued that inadequate overall demand would eventually lead to high unemployment and that to stimulate an increase in demand, expenditure on any of the four components of the national income model has to be increased. In reality, during recessionary spells, only the government has the capacity to find and spend the quantum of finance needed to galvanize consumption, investments, or net exports.

Pollen (2008) explained that the main difference between the two schools of thought is that Classical economists argue that the economy is self-regulating and capable of achieving the natural levels of output, while Keynesian economists advocate a relationship between government expenditure and output. The implication of a Keynesian approach to growth in output therefore is that if government intervenes in the economy with policies that cause interest rate reduction (for example), borrowing cost will reduce which encourages private sector participation, leading to increases in aggregate demand and employment (crowding in). The implication of a Classical approach to growth in real GDP on the other hand, is that policy intervention to encourage increased spendings will result in inflation which will in turn result in unemployment as prices rise above the natural levels and employers respond by reducing wages and employment rates to curtail their costs (crowding out) (Ogujiuba and Cornelissen, 2020, p. 72).

In the Principles of Political Economy and Taxation, Ricardo (1821), a classical economist, attempted to reconcile the Classical and Keynesian approaches by introducing his Ricardian Equivalence proposition. Ricardo (1821) posited that government can either finance its expenditure by increasing taxation revenues or by borrowing and deficit financing, however, irrespective of how government chooses to finance its expenditure, the outcome for the economy will be exactly the same or equivalent as rational taxpayers will prepare for the expected increase in future taxation to finance current government expenditure or fiscal deficits by saving an amount similar to current deficit spending, so the net change to total spending will be zero. The implication of Ricardian Equivalence theory is that when a government funds its expenditure via deficit financing with a view to boosting economic growth, private expenditure will simply drop by an equivalent amount as taxpayers increase their savings, so that the net implication on economic growth is zero.

Barro (1974) extended the Ricardian Equivalence theory by contending that fiscal deficit financing and changes in tax rates will have no effect on economic growth, interest rates and investment as deficit-financed government expenditures or tax changes would both lead to future tax increases. The implication for the economy is that efforts at stimulating economic growth through increased government borrowings will not be ineffective because investors and consumers will increase their savings rates as they expect that government will increase tax rates in the future in order to pay off the borrowings of the past; this will offset any increase in aggregate demand from the deficit-financed government spendings. The Ricardian equivalence is also known as the Ricardo-Barro effect.

3. Empirical Literature

The empirical literature on the relationship between government expenditure and private investment is convoluted and has been the subject of debates and inferences over many decades and across both developed and developing economies. For developing economies, some of these empirical studies find that government expenditure has a significant and positive effects on private sector investments (Aschauer, 1989; Hsieh and Lai, 1994). Some other empirical studies find that evidence of significant and negative relationship between government expenditure and private sector investments especially for developing economies (Ghani and Din, 2006; Swaby, 2007).

Aluthge, Jibir, and Abdu (2021) find that contradictory results from the myriad of empirical studies were as a result of the use of different methodologies, study scope, or dataset. The authors concluded that "irrespective of which of the argument may be more convincing, what remains obvious is that there is need for further studies to go beyond their specifications and methodologies" (p. 140). As discussed by Aluthge, Jibir , and Abdu (2021), using an appropriate methodology for time series data is a critical part of time series analysis as selection of the wrong specification of the model or using wrong method affects research outcomes including biased and unreliable estimations. Shrestha and Bhatta (2018) asserted that the primary method selection for time series analysis is by using the results of unit root test as the test determines the stationarity of the variable (p. 3). This implies that if all the variables of interest are stationary, either one of OLS or VAR models is ideal to provide unbiased estimates. However, if all the variables of interest are non-stationary, OLS or VAR models may not be appropriate to analyse relationships. In addition, if variables of interest in the analysis are of mixed type, i.e., some are stationery and others are non-stationary, the ARDL models are most appropriate.

Economic literature is inundated with investigations of the relationship between government expenditure and private investments but very little has been done to investigate the relationship between components of government expenditure and private investments. Nwosa et al. (2013) for example, found that government recurrent expenditure had a crowding in effect on private investments in Nigeria while capital expenditure had a crowding out effect on private investments. Rahman et al. (2015) found that over a 36-year period to 2010, there was a crowding out effect of community services and debt servicing government expenditure on private investments; but they also found that there was a crowing in effect of agriculture, health, transportation, and communication government expenditure on private investments. Using data for 5 west African countries that included Nigeria, Omojoliabi et al. (2016) determined that when government expenditure is disaggregated, recurrent expenditure and external debt showed crowding out effects albeit, not significant, while capital expenditure showed significant crowding in effects.

4. Methodology

The research methodology involved both qualitative analyses i.e., use of pictorial representations, and quantitative analysis i.e., relying on econometric techniques in the form of the Autoregression Distributed Lag (ARDL) model to determine the relationship between the dependent and independent variables.

4.1 Data Description

The analyses undertaken in this study involved the use of annual, secondary data, with data on Gross Capital Formation obtained from the World Bank's World Development Indicators database while all other secondary data was obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin. The period covered was from 1981 – 2021, a period of 40 years cumulatively. The specific variables used and their notational representation in this paper are described in Table 1. Note that all regressor and control variables are lagged by one year t-1.

Table 1. Variables and Sources

Variables	Notation	Sources
Gross Fixed Capital Formation, proxy for Private Investment	PI	World Bank WDI
Recurrent Administration Expenditure	RAE	CBN Statistical Bulletin
Recurrent Social & Community Services Exp	RSE	
Recurrent Economic Services Expenditure	REE	
Recurrent Transfers Expenditure	RTE	
Capital Administration Expenditure	CAE	
Capital Social and Community Services Exp.	CSE	
Capital Economic Services Expenditure	CEE	
Capital Transfers Expenditure	CTE	
Annual Inflation Rate (Consumer Proce Index)	INF	
Annual GDP Growth Rate	GGR	
Official Exchange Rate	EXR	
Annual Average Prime Lending Rate	INR	

4.2 Econometric Specification

Apart from the justification for the inclusion of prime lending rate (LNR) as a control variable in our model, - which was explained in the introductory section of this paper - we also include Inflation Rate (INF), GDP Growth Rate (GGR), and Official Exchange Rate (EXR) as additional control variables. Inflation rate is used as a proxy for economic uncertainty (Abubakar and Mamman, 2021). Tobin (1965) posited that an increase in price levels would lead to an increase in capital investment, and in turn, an increase in growth. This position is feasible as rising rates of GDP can be inflationary. In theory therefore, when the economy is not running at capacity, rising price levels helps increase spending and production, which equates to more aggregated demand. Keynes(1936) noted that "saving can ultimately be detrimental to the economy because of the paradox of thrift. This theory argues that if everyone individually cuts spending to increase saving, aggregate saving will eventually fall because one person's spending is someone else's income. Because increased saving, by definition, decreases current consumption, it stifles demand" (Vermann, 2012, para 3). Inclusion of GDP Growth Rate in the private investment model is consistent with the Keynesian multiplier principle where an increase in a component of national income such as consumption, investment, or government spending, produces an increase in aggregate demand that is greater than the initial increase in the component. Exchange rate is important as a determinant of private investment because it is a critical function of trade and capital flows.

Our empirical model therefore takes the form:

PI = f (Public Expenditure, Inflation Rate, GDP Growth Rate, Exchange Rate, Interest Rate) (1)

The public expenditure variable is further disaggregated into capital and recurrent expenditures

PI = f (RAE, RSE, REE, RTE, CAE, CSE, CEE, CTE, INF, GGR, EXR, INR) (2)

The econometric model to be estimated is therefore specified as:

$PI_t = \alpha o + \Sigma\alpha 1\ CE_t + \Sigma\alpha 2\ RE_t + \Sigma\alpha 3 X_t + \mu_t$ (3)

Where CE_t are the components of capital expenditure at the time, RE_t are the components of recurrent expenditure at the time, and X_t are the control variables which include inflation, exchange rate, rate of economic growth, and lending rate at the time. μi is the error term.

We further disaggregate the model into two to capture the specific components of government capital and recurrent expenditure. For the capital expenditure component:

$PI_t = \alpha 0 + \alpha 1\ CAE_t + \alpha 2\ CSE_t + \alpha 3 CEE_t + \alpha 4\ CTE_t + \alpha 3\ X_t + \mu$ (4)

Where CAEt is the capital expenditure on administration at the time, CSE_t is the capital expenditure on social and community services at the time, CEE_t is the capital expenditure on economic services at the time, and CTE_t is the capital expenditure on transfers at the time.

For the recurrent expenditure component:

$PI_t = \alpha 0 + \alpha 1\ RAE_t + \alpha 2\ RSE_t + \alpha 3 REE_t + \alpha 4\ RTE_t + \alpha 3\ X_t + \mu$ (5)

Where RAE_t is the recurrent expenditure on administration at the time, RSE_t is the recurrent expenditure on social and community services at the time, REE_t is the recurrent expenditure on economic services at the time, and RTE_t is the recurrent expenditure on transfers at the time.

The general form of an ARDL model is specified in Equation 4 as follows:

$y_t = \beta 0 + \sum \beta I\ y_{t-1} + \sum \delta\ x_{t-1} + \mu_t$ (6)

Where yt is the dependent variable, which is a function of its lagged values y_{t-1} as well as the lagged values of the independent variables x, δ denotes the coefficients of the short run dynamics, (Musa, 2020). We can then express the functional form of Equations 2 and 3 in ARDL econometric linear form:

$PI_t = \beta_0 + \beta 1 PI_{t-1} + \beta 2 CAE_{t-1} + \beta 3 CSE_{t-1} + \beta 4 CEE_{t-1} + \beta 5 CTE_{t-1} + \beta 6 X_{t-1} + \mu t$ (7)

Equation 5 is the ARDL long run model for disaggregated components of capital expenditure as well as macroeconomic indicators X i.e., inflation rate, exchange rate, GDP growth rate, and prime lending rate with the predictors all lagged by one year. β0 is the intercepts and β1, β2, β3, β4, β5, and β6, are the coefficients of the predictor variables. μ_t is the stochastic or error term that captures the impact of other predictor variables that are not included in the model.

$\Delta PI_t = \beta 0 + \beta 1 \Delta PI_{t-1} + \beta 2 \Delta CAE_{t-1} + \beta 1 \Delta CSE_{t-1} + \beta 1 \Delta CEE_{t-1} + \beta 1 \Delta CTE_{t-1} + \beta 1 \Delta X_{t-1} + \mu t$ (8)

Equation 6 is the ARDL short run model for disaggregated components of capital expenditure as well as macroeconomic indicators X i.e., inflation rate, exchange rate, GDP growth rate, and prime lending rate with the predictors all lagged by one year. β0 is the intercepts and β1, β2, β3, β4, β5, and β6, are the coefficients of the predictor variables. μ_t is the stochastic or error term that captures the impact of other predictor variables that are not included in the model. μt is the stochastic or error term that captures the impact of other predictor variables that are not included in the model.

The ARDL long run model for recurrent expenditure is formulated as follows:

$PI_t = \beta 0 + \beta 1 PI_{t-1} + \beta 2 RAE_{t-1} + \beta 3 RSE_{t-1} + \beta 4 REE_{t-1} + \beta 5 RTE_{t-1} + \beta 6 X_{t-1} + \varepsilon$ (9)

Where PIt is the private investment at the time, PIt-1 is the private investment lagged by one year, RAEt-1 is the recurrent administrative expenditure lagged by one year, RSE_{t-1} is the recurrent social and community services expenditure lagged by one year, REE_t is the recurrent economic services expenditure lagged by one year, RTE_{t-1}

is the recurrent transfer expenditure lagged by one year, and X_{t-1} includes the following control variables: annual changes in inflation rate, GDP Growth Rate, exchange rate, and prime lending rate lagged by one year.
The short run ARDL model for recurrent expenditure is formulated as follows:

$$\Delta PI_t = \beta 0 + \beta 1 \Delta PI_{t-1} + \beta 2 \Delta RAE_{t-1} + \beta 1 \Delta RSE_{t-1} + \beta 1 \Delta REE_{t-1} + \beta 1 \Delta RTE_{t-1} + \beta 1 \Delta X_{t-1} + \varepsilon \quad (10)$$

Where PIt is the annual change in private investment at the time, RAE_t is the annual change in recurrent administrative expenditure at the time, RSE_t is the annual change in recurrent social and community services expenditure at the time, REE_t is the annual change in recurrent economic services expenditure at the time, RTE_t is the recurrent transfer expenditure at the time, and X_t includes the following control variables: annual changes in inflation rate, GDP Growth Rate, exchange rate, and prime lending rate at the time.

5. Findings

5.1 Descriptive Data Analyses

The analyses undertaken in this study involved the use of annual, secondary data, with data on Gross Capital The average growth rate of GDP from 1981 – 2021, was 3.04 per cent. while that of inflation rate was 18.95 per cent and prime lending rate was 17.31 during the same period. These statistics indicate that while the Nigerian economy showed decent growth, cost of funding and general price levels were still rather high during that same period (see Table 2).

Table 2: Category Statistics

Variable	Count	Mean	Std. Dev.	Std Error of Mean
Private Investment (PI)	41	8637.7140	1979.1420	309.0900
Recurrent Admin Expenditure (RAE)	41	544.4980	676.6331	105.6723
Recurrent Economic Expenditure (REE)	41	143.5316	177.7830	27.7650
Recurrent Social and Comm. Exp (RSE)	41	334.7593	455.8365	71.1897
Recurrent Transfers Expenditure (RTE)	41	770.1880	1144.6870	178.7700
Capital Administration Expend. (CAE)	41	140.1835	167.3193	26.1309
Capital Economic Expenditure (CEE)	41	67.6281	80.0330	12.4991
Capital Social and Comm. Exp (CSE)	41	254.0765	277.2859	43.3048
Capital Transfers Expenditure (CTE)	41	89.8843	121.2011	18.9284
Official Exchange Rate (EXR)	41	108.1675	109.9115	17.1653
GDP Growth Rate (GGR)	41	3.0415	5.3854	0.8411
Inflation Rate (INF)	41	18.9491	16.6594	2.6018
Prime Lending Rate (LNR)	41	17.3099	4.6378	0.7243

Source: Authors' Computation on EViews

5.2 Correlation Matrix

Table 3 shows the correlation coefficients between all the possible pairs of values. It shows for example, that private investment is positively correlated to all the components of capital expenditure and recurrent expenditure but negatively correlated with lending rates, inflation, and economic growth rate. The relationship as indicated in the results is consistent with economic theory in the case of inflation and growth in real GDP (particularly in Keynesian expectations). It should however be noted that in general, descriptive statistics only show the direction and strength of relationships and not causation. The strongest level of correlation (0.990) is between recurrent administrative expenditure and recurrent social expenditure, while the weakest level of correlation (-0.007) is between capital transfer expenditure and growth in real GDP.

Table 3 – Correlation Result

	PI	RAE	REE	RSE	RTE	CEE	CAE	CSE	CTE	GGR	EXR	INF	LNR
PI	1												
RAE	0.411	1											
REE	0.37	0.927	1										
RSE	0.416	0.990	0.892	1									
RTE	0.388	0.942	0.822	0.948	1								
CEE	0.375	0.917	0.917	0.89	0.884	1							
CAE	0.392	0.941	0.91	0.918	0.915	0.985	1						
CSE	0.369	0.918	0.891	0.899	0.900	0.969	0.977	1					
CTE	0.341	0.885	0.786	0.898	0.889	0.827	0.862	0.883	1				
GGR	-0.491	0.086	0.166	0.045	0.012	0.192	0.175	0.178	-0.007	1			
EXR	0.381	0.947	0.861	0.929	0.937	0.899	0.921	0.913	0.842	0.159	1		
INF	-0.276	-0.31	-0.317	-0.286	-0.228	-0.318	-0.312	-0.338	-0.188	-0.208	-0.318	1	
LNR	-0.417	-0.191	-0.155	-0.199	-0.22	-0.165	-0.172	-0.148	-0.15	0.514	-0.095	0.337	1

Source: Authors' Computation on EViews

5.3 Test for Stationarity (Unit Root Test)

The test for unit root was carried out on all the variables in the model to determine whether or not all the variables in the series are stationarity. Most economic and business data are known to exhibit non-stationary property which makes them predisposed to spurious or unreliable result (Aero and Ogundipe, 2018). To avoid this, all variables are required to be stationary at level or at first difference. To test for the stationarity of our time series data set, the Augmented Dickey-Fuller (ADF) unit root test (Dickey and Fuller, 1979) was employed. The ADF test is more suitable when the sample period is more than 25 but less than 50 (Arltova and Fedorova, 2016). For the null hypothesis (H0), it was specified that the variable has a unit root i.e., variable is non-stationary, while for the alternative hypothesis (H1), it was specified that the variable has no unit root i.e., variable is stationary. The results in Table 4 shows the stationarity level of the variables. Growth in real GDP and lending rate are stationary at level I(0)) while private investment, recurrent administrative expenditure, recurrent social expenditure, recurrent economic expenditure, recurrent transfer expenditure capital administrative expenditure, capital social expenditure, capital economic expenditure, capital transfer expenditure, lending rate, and exchange rate are stationary at first difference I(1).

5.4 Vector Autoregressive (VAR) Lag Order Selection

Vector Autoregressive (VAR) models were run to examine the dynamic relationships that exist between all the variables as they interact with one another, this was in order to determine and select the optimum lag period for our models, using selection criteria such as: LR test statistic, final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SIC), and Hannan-Quinn information criterion (HQ). In Table 4, we run for the components of recurrent expenditure:

From the VAR Lag Order Selection result in Table 4, majority of the criterion selected Lag (3) as the optimum lag for estimating the long run relationship except for the Akaike information criterion (AIC).

Table 4 - Test for the stationarity of time series data set (Augmented Dickey-Fuller Test Result)

Variable	Prob.*	Status
PI	0.0001	I(1)
RAE	0.0000	I(1)
RSE	0.0000	I(1)
REE	0.0001	I(1)
RTE	0.0000	I(1)
CAE	0.0231	I(1)
CSE	0.0000	I(1)
CEE	0.0000	I(1)
CTE	0.0000	I(1)
INF	0.0095	I(1)
GGR	0.0042	I(0)
EXR	0.0029	I(1)
LNR	0.0187	I(0)

Where I(0) means stationarity at level and I(1) means stationarity at first difference.
Source: Authors computation on EViews

Table 5. Model 1 (Recurrent Expenditure) VAR Lag Order Selection ResultEndogenous variables: PI
Exogenous variables: C RAE REE RSE RTE INF GGR EXR LNR
Sample: 1981 - 2021

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-269.7076	NA	781991.2	16.39456	16.79860	16.53235
1	-269.0912	0.870194	803837.3	16.41713	16.86606	16.57023
2	-266.8207	3.071791	750600.3	16.34240	16.83622	16.51080
3	-263.4728	4.332669*	658763.4*	16.20428	16.74300*	16.38800*
4	-262.4255	1.293693	663007.4	16.20150*	16.78511	16.40053
5	-262.2141	0.248699	702183.5	16.24789	16.87639	16.46222
6	-262.1340	0.089533	750992.1	16.30200	16.97539	16.53165
7	-262.1293	0.004994	808667.3	16.36055	17.07883	16.60550

* Indicates lag order selected by the criterion
Source: Authors computation on EViews
In Table 6, we run the same analysis for the components of capital expenditure:

Table 6: Model 2 (Capital Expenditure) VAR Lag Order Selection Result
Endogenous variables: PI
Exogenous variables: C CAE CEE CSE CTE INF GGR EXR LNR
Sample: 1981 - 2021

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-269.7076	NA	781991.2	16.39456	16.79860	16.53235
1	-269.0912	0.870194	803837.3	16.41713	16.86606	16.57023
2	-266.8207	3.071791	750600.3	16.34240	16.83622	16.51080
3	-263.4728	4.332669*	658763.4*	16.20428	16.74300*	16.38800*
4	-262.4255	1.293693	663007.4	16.20150*	16.78511	16.40053
5	-262.2141	0.248699	702183.5	16.24789	16.87639	16.46222
6	-262.1340	0.089533	750992.1	16.30200	16.97539	16.53165
7	-262.1293	0.004994	808667.3	16.36055	17.07883	16.60550

* Indicates lag order selected by the criterion
Source: Authors computation on EViews
From the VAR Lag Order Selection result on Table 6, majority of the criterion also selected Lag (3) as the optimum lag for estimating the long run relationship except for the Akaike information criterion (AIC).

5.5 Co-Integration Analysis
To determine whether the short-run models or long-run models or both were the best models to use for our analyses,

and also to test for cointegration of the variables, the more popular tests are the Johansen Test and the Engle-Granger Test; however, these tests are preferred when the test for stationarity shows all variables are stationary at level. When some of the variables are stationery at level while others are stationary at first difference, it is better to make use of the Bounds Test for cointegration (Sam, et al. 2019). From the foregoing, since the variables are integrated of different orders, the bounds test was used to measure the relationship that exist amongst the variables. Table 7 summarises the result of the bounds test.

The decision rule is that if the F or t-statistic value is less than the I(0) value, we do not reject the null hypothesis of no level relationship then estimate Auto Regressive Distributed Lag (ARDL), but if the F or t-statistic value is greater than the I(0) value, reject the null hypothesis of no level relationship and conclude that there exists a long run relationship then estimate Error Correction Model (ECM). The result for model 1 (a) and (b) (both for the F and t-statistics) in Table 6 shows that there exists a long run relationship between the endogenous variable (Private Investment) and the exogenous variables – regressors - (RAE, RSE, REE, RTE, GGR, LNR, INF, and EXR) with F-statistic of 33.695 and t-statistics of 9.718521 (absolute value) which are greater than I(1) value of 3.39 and 4.72 (absolute value) respectively at 95% confidence interval. For model 2 (a), the F statistics shows a long run relationship while for model 2(b), the t-statistics shows a short run relationship.

We however estimate model 2 (b) on the basis of a long run relationship as t-statistics are only used to compare two means or conditions while F-statistics is used to compare variances or the equality of means among three or more groups or conditions (Frost, 2017). This invariably implies that the long run relationship between private investment and all the components of recurrent expenditure are significant while the short run relationships or trends are not. For model 2 (b), we therefore also estimated the long run relationship between private investment and all the components of capital expenditure.

Table 7 - Results of Bounds Test for Cointegration

Model 1 (a)	F-Statistic	Signif.	I(0)	I(1)	Decision
ARDL(1, 3, 3, 3, 3, 3, 3, 2, 3)	33.69582	5%	2.22	3.39	Estimate ECM Long Run Model
Model 1 (b)	t-Statistic	Signif.	I(0)	I(1)	Decision
ARDL(1, 3, 3, 3, 3, 3, 3, 2, 3)	-9.718521	5%	-2.86	-4.72	Estimate ECM Long Run Model
Model 2 (a)	F-Statistic	Signif.	I(0)	I(1)	Decision
ARDL(1, 3, 3, 3, 3, 3, 2, 3, 3)	3.927419	5%	2.22	3.39	Estimate ECM Long Run Model
Model 2 (b)	t-Statistic	Signif.	I(0)	I(1)	Decision
ARDL(1, 3, 3, 3, 3, 3, 2, 3, 3)	-1.871626	5%	-2.86	-4.72	Estimate ARDL Short Run Model

Source: Authors Computation using Eviews

5.6 ARDL Error Correction Regression

ARDL was estimated with EViews evaluating 65,536 models and ARDL (1, 3, 3, 3, 3, 3, 2, 3, 3) was selected to be the best model to test the relationship between private investment and the regressors CAE, CEE, CSE, CTE, INF, GGR, EXR, and LNR. Therefore, ECM long run model was estimated for Model 1 and both ARDL and ECM was also estimated for Model 2. See Table 8.

The result in Table 8 show that the cointegration equation effect is statistically significant at 99% confidence interval. Also, the R-squared and adjusted R-squared are also significantly high at 99.49 per cent and 98.54 per cent respectively with the F-statistic 0.000 showing that the model is a good fit. For the long run recurrent expenditure, the optimum selected Model is that in which the variables are lagged as follows: PI (1 year), RAE, REE, RSE, RTE, INF, GGR, and LNR (3 years respectively), and EXR (2 year).

Table 8 – ARDL Error Correction Regression (Model 1 – Long-run Recurrent Expenditure Relationship)

ARDL Error Correction Regression
Dependent Variable: D(PI)
Selected Model: ARDL(1, 3, 3, 3, 3, 3, 3, 2, 3)
Case 3: Unrestricted Constant and No Trend
Sample: 1981 - 2021
Included observations: 38

ECM Regression
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13693.41	502.0267	-27.27625	0.0000
D(RAE)	-784.2517	24.81591	-31.60277	0.0000
D(RAE(-1))	-153.1708	20.47703	-7.480125	0.0007
D(RAE(-2))	-433.9750	25.00898	-17.35276	0.0000
D(REE)	8.063551	0.550860	14.63811	0.0000
D(REE(-1))	-24.47355	1.070693	-22.85766	0.0000
D(REE(-2))	-6.194581	0.556054	-11.14024	0.0001
D(RSE)	93.15385	72.45552	1.285669	0.2549
D(RSE(-1))	3669.808	132.1032	27.77987	0.0000
D(RSE(-2))	1881.330	87.72791	21.44506	0.0000
D(RTE)	-326.9695	198.6267	-1.646151	0.1607
D(RTE(-1))	-6858.650	323.0621	-21.23013	0.0000
D(RTE(-2))	-2222.847	187.5748	-11.85046	0.0001
D(INF)	-76.76115	3.078913	-24.93125	0.0000
D(INF(-1))	36.29431	2.577904	14.07900	0.0000
D(INF(-2))	-36.56169	3.653889	-10.00624	0.0002
D(GGR)	-88.53535	9.125646	-9.701817	0.0002
D(GGR(-1))	140.1498	8.884501	15.77463	0.0000
D(GGR(-2))	109.6049	9.742279	11.25044	0.0001
D(EXR)	16.99663	2.255630	7.535205	0.0007
D(EXR(-1))	-26.41622	2.815706	-9.381738	0.0002
D(LNR)	-506.7752	256.0954	-1.978853	0.1047
D(LNR(-1))	4036.634	281.4742	14.34105	0.0000
D(LNR(-2))	2093.714	316.2712	6.619996	0.0012
CointEq(-1)*	-0.995653	0.035458	-28.07993	0.0000

R-squared	0.994871	Mean dependent var	0.488302
Adjusted R-squared	0.985402	S.D. dependent var	1132.814
S.E. of regression	136.8690	Akaike info criterion	12.91908
Sum squared resid	243530.5	Schwarz criterion	13.99644
Log likelihood	-220.4625	Hannan-Quinn criter.	13.30239
F-statistic	105.0664	Durbin-Watson stat	2.829956
Prob(F-statistic)	0.000000		

Source: EViews

The result on Table 9 show that the cointegration equation effect is statistically significant at 99% confidence interval. Also, the R-squared and adjusted R-squared are also significantly high at 95.8 per cent and 88.04 per cent respectively with the F-statistic 0.000 showing that the model is a good fit. For the long run capital expenditure, the optimum selected model is that in which the variables are lagged as follows: PI (1 year), CAE, CEE, CSE, CTE, INF, EXR, and LNR (3 years respectively), and GGR (2).

Table 9 – ARDL Error Correction Regression (Model 2 – Long-run Capital Expenditure Relationship)

ARDL Error Correction Regression (Long run)
Dependent Variable: D(PI)
Selected Model: ARDL(1, 3, 3, 3, 3, 3, 2, 3, 3)
Sample: 1981 2021
Included observations: 38

ECM Regression
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3944.761	421.6672	-9.355153	0.0002
D(CAE)	12.73050	6.398940	1.989471	0.1033
D(CAE(-1))	23.66455	6.273974	3.771859	0.0130
D(CAE(-2))	23.78606	5.323581	4.468056	0.0066
D(CEE)	-26.46128	5.887636	-4.494380	0.0064
D(CEE(-1))	-23.85166	6.211767	-3.839755	0.0121
D(CEE(-2))	-18.20294	5.210522	-3.493497	0.0174
D(CSE)	3.285008	2.411444	1.362258	0.2313
D(CSE(-1))	0.754314	2.707693	0.278582	0.7917
D(CSE(-2))	-6.530724	2.631102	-2.482125	0.0557
D(CTE)	336.7998	86.04350	3.914297	0.0112
D(CTE(-1))	-581.7813	84.53345	-6.882261	0.0010
D(CTE(-2))	144.6977	48.06645	3.010367	0.0297
D(INF)	-16.92352	5.731267	-2.952841	0.0318
D(INF(-1))	30.94355	5.961610	5.190469	0.0035
D(INF(-2))	31.06794	6.512801	4.770289	0.0050
D(GGR)	70.69297	26.62584	2.655051	0.0452
D(GGR(-1))	114.2486	27.48833	4.156260	0.0089
D(EXR)	-16.76451	7.061633	-2.374027	0.0636
D(EXR(-1))	28.35542	9.429206	3.007191	0.0299
D(EXR(-2))	-52.97243	8.343439	-6.348992	0.0014
D(LNR)	2251.499	517.0772	4.354281	0.0073
D(LNR(-1))	-1253.144	495.6776	-2.528144	0.0526
D(LNR(-2))	-1454.556	470.1115	-3.094067	0.0270
CointEq(-1)*	-0.416918	0.043490	-9.586533	0.0002

R-squared	0.957985	Mean dependent var	0.488302
Adjusted R-squared	0.880418	S.D. dependent var	1132.814
S.E. of regression	391.7345	Akaike info criterion	15.02220
Sum squared resid	1994927.	Schwarz criterion	16.09956
Log likelihood	-260.4218	Hannan-Quinn criter.	15.40551
F-statistic	12.35044	Durbin-Watson stat	3.012934
Prob(F-statistic)	0.000015		

Source: EViews 10 output

5.7 Diagnostic Tests

We used the Breusch–Godfrey test to test for autocorrelation in the two models 1 and 2. The test makes use of the residuals from the models in our regression analyses. The null hypothesis is that there is no serial correlation of any order up to p while the alternative hypothesis is that there is the presence of serial correlation in the models. The result on Table 10 shows that the null hypothesis cannot be rejected with p-value of 0.2198 which is greater 0.05 level of significant at 95% confidence interval for rejecting the null hypothesis, which implies that the ECM is a good fit (no serial correlation).

Table 10- Test for Serial Correlation (Breusch-Godfrey Serial Correlation LM Test)

F-statistic	3.705727	Prob. F(3,2)	0.2198

Source: EViews

5.8 Test for Heteroskedasticity

The existence of heteroscedasticity is a major concern in regression analysis as it invalidates statistical tests of significance that assume that the modelling errors all have the same variance. The null hypothesis is that there is homoskedasticity (error term are normally distributed) while the alternative hypothesis is that there is heteroscedasticity (error are not equally distributed across the variables). The test results for models 1 and 2 are shown in Tables 11 and 12 respectively.

From the two tables, we cannot reject the null hypotheses as the models are not suffering from heteroscedasticity for both model 1 and 2.

Table 11 - Model 1 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.404475	Prob. F(32,5)	0.9470
Obs*R-squared	27.41102	Prob. Chi-Square(32)	0.6982
Scaled explained SS	0.499622	Prob. Chi-Square(32)	1.0000

Source: EViews

Table 12 - Model 2 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.184012	Prob. F(32,5)	0.9990
Obs*R-squared	20.55023	Prob. Chi-Square(32)	0.9410
Scaled explained SS	1.101529	Prob. Chi-Square(32)	1.0000

Source: EViews

6. Conclusion

Using data from 1981 to 2021, this study disaggregate the government expenditure into its component parts and sought to find out the type and extent of the relationship (if any) between the short- and long-term effects of the disaggregated component of government expenditure on private investments. This paper made a number of interesting findings; first, our study determined that the components of both recurrent expenditure and capital expenditure are significant determinants of the relationships with private investment in the long run, while the relationships between the components of both recurrent expenditure and capital expenditure are not significant determinants of the relationships with private investment in the short run.

The results indicates that there is a significant crowding-in effect between all components of government expenditure and private investments in Nigeria. Crowding in has been variously defined as a situation which occurs when increasing government expenditure causes a rise in the growth of GDP which then encourages a rise in private sector investments due to the presence of additional investment prospects (Aschauer, 1989; Hatano, 2010; Andrade and Duarte, 2016). In this situation, an increase an increase in public expenditure results in an increase in private investments. Examples of this are government construction of roads, bridges, dams, provision of electricity, air and seaports, railways, etc. This is also consistent with the Keynesian school particular for an economy like Nigeria which is operating below capacity, and government needs to spend heavily in order to create the enabling environment for the private investments while increasing aggregate demand and jobs.

Secondly, the long run recurrent expenditure model and the long run capital expenditure model are statistically significant at 99% confidence interval. With the R-squared and adjusted R-squared for both at 99.49% and 98.54% (for recurrent expenditure model), and 95.8% and 88.04% (for capital expenditure model) respectively, and both with F-statistic of 0.000 showing that the models are a good fit. Thirdly, the optimal recurrent expenditure model is one in which private investment is a function of recurrent administrative expenditure, recurrent economic expenditure, recurrent social expenditure, recurrent transfer expenditure, inflation rate, real GDP growth rate, and lending rate all lagged by 3 years respectively while the exchange rate is lagged by 2 years. The optimal capital expenditure model on the other hand is one in which private investment is a function of capital administrative expenditure, capital economic expenditure, capital social expenditure, capital transfer expenditure, inflation rate, exchange rate, and lending rates all lagged by 3 years respectively, while real GDP growth rate is lagged by 2 years.

Finally, our study show that lending rates inflation rates, exchange rates, and GDP growth rates, are significant determinants of private investments. As a result, in government's attempts at stimulating private investments, the focus should not only be on public expenditure but also lending rates, inflation rates, and exchange

rates are moderated to encourage businesses and entrepreneurs but also that private investors are not concerned about their investments and tempted to divest, if economic growth appears to be stagnant or worse still, declining.

References

Abubakar, A. B., and 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.

Abubakar, A. B. and Mamman, S. O. (2020). Permanent and transitory effect of public debt on economic growth. *Journal of Economic Studies*, 48 (5), 1064-1083.

Ahmed, H. and Miller, S. M. (2007). Crowding-out and crowding-in effects of the components of government expenditure. *Contemporary Economic Policy*. 18(1):124-33. https://doi.org/10.1111/j.1465-7287.2000.tb00011.x

Alauddin, M. (2007). Does public borrowing crowd out private investment? The Bangladesh evidence. *Bangladesh Bank Working Paper Series*, WP 0708.

Aluthge, C., Jibir, A., and Abdu, M. (2021). Impact of Government Expenditure on Economic Growth in Nigeria, 1970-2019. *CBN Journal of Applied Statistics* Vol. 12 No. 1 (June 2021) 139-174.

Aero, O., and Ogundipe, A. A. (2018). Fiscal deficit and economic growth in Nigeria: Ascertaining a feasible threshold. *International Journal of Economics and Financial Issues*, 8(3), 296-306.

Andrade, J., Duarte, A. P. (2016). Crowding-in and crowding-out effects of public investments in the Portuguese economy. *International Review of Applied Economics*. 30 (4): 488–506.

Arltova, M., and Fedorova, D. (2016). Selection of unit root test on the basis of length of the time series and value of AR (1) parameter. *Statistik*, 96(3).

Aschauer, D. (1989). Is public expenditure productive? *Journal of Monetary Economics*, Vol. 23, pp. 177-200.

Asogwa, F. O., & Okeke, I. Z. (2013). The crowding-out effect of budget deficits on private investment in Nigeria. *European Journal of Business and Management*, Vol. 5, No 20

Barro, R. (1974). Are Government Bonds Net Wealth? *Journal of Political Economy*. 82 (6): 1095–1117. doi:10.1086/260266. S2CID 154705295.

CBN. (2022). *CBN Statistical Bulletin*. Abuja: Central Bank of Nigeria

de Soyres, F., Santacreu, A. M., and Young, H. (2022). Fiscal policy and excess inflation during Covid-19: a cross-country view. *FEDS Notes*. Washington: Board of Governors of the Federal Reserve System, July 15, 2022.

Dickey, D. A. and Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427-431.

Frost, J, (2017). *How to Interpret the F-test of Overall Significance in Regression Analysis*. Statistics By Jim - Making statistics intuitive. Retrieved on August 19, 2023 from https://statisticsbyjim.com/regression/interpret-f-test-overall-significance-regression/

Furceri, D. and Sousa, R. M. (2009). The Impact of Government Spending on the Private Sector: Crowding-out versus Crowding-in Effects. *NIPE Working Papers* 6/2009, NIPE - Universidade do Minho.

Ghani, E. and Din, M. (2006). The impact of public investment on economic growth in Pakistan. *The Pakistan Development Review*, Vol. 45 No. 1, pp. 87-98.

Ghatak, S. and Siddiki, J. (2001). The use of the ARDL approach in estimating virtual exchange rates in India. *Journal if Applied Statistics*, 28: 573-583.

Greenspan, A. (2002). Testimony of Chairman Alan Greenspan. Current fiscal issues Before the Committee on the Budget, U.S. House of Representatives September 12, 2002. Retrieved on August 14, 2023 from http://www.federalreserve.gov/boarddocs/testimony/ 2002/20020912/default.htm

Hatano, T. (2010). Crowding - in Effect of Public Investment on Private Investment. *Public Policy Review*. 6 (1): 105–120.

Hsieh, E. and Lai, K.N. (1994). Government spending and economic growth: the G-7 experience. *Review of Applied Economics*, Vol. 26, pp. 535-542.

Iheonu, C. O. and Nwakeze, H. M. (2016). Investment, output and real interest rate in Nigeria: an ARDL analysis. *Journal of Economics and Allied Research*, 1(1), 72- 90.

Irvin, T. (2012). *Macroeconomics for Today* (8th ed.). Mason, OH: Cengage Learning.

Keynes, J. M. (1936). *The General theory of Employment, Interest, and Money*. London, Macmillan Publication.

Lidiema, C. (2017). Effects of government borrowing on private investments in Kenya, *KBA Centre for Research on Financial Markets and Policy Working Paper Series*, No. 22, Kenya Bankers Association (KBA), Nairobi

Looney, P. e. (1995). Public Sector Deficits and Private Investment: A Test of the Crowding-out Hypothesis in Pakistan's Manufacturing Industry. *The Pakistan Development Review.* Vol. 34, No. 3 (Autumn 1995), pp. 277-297.

Mabula, S. and Mutasa, F. (2019). The effect of public debt on private investment in Tanzania. *African Journal of Economic Review*, 7(1), 109-135.

Majumder, A. (2007). Does public borrowing crowd-out private investment? The Bangladesh evidence. *Bangladesh Central Bank Working Paper*, WP 0708.

McCann, C. M., Baylis, M., and Williams, D. J. (2010). The development of linear regression models using environmental variables to explain the spatial distribution of Fasciola hepatica infection in dairy herds in England and Wales. *International Journal for Parasitology*, 40(9): 1021-1028. https://doi.org/10.1016/j.ijpara.2010.02.009.

Mona, E, F. (2013). Crowding out effect of public borrowing: The case of Egypt. *International Research Journal of Finance and Economics*, 107, 28-28.

McCulloch, J. R. (1888). Essay on the Funding System, in *The Works of David Ricardo. With a Notice of the Life and Writings of the Author*, by J.R. McCulloch, London: John Murray.

Musa, N. (2020). Impact of Trade Openness and Exchange rate Volatility on Economic Growth in Nigeria. *Interdisciplinary Journal of African and Asian Studies*, Volume 6 No. 2, 2020. pp. 185 -198.

Nwosa P. I., Adebiyi O. O., and Adedeji A. O. (2013). An Analysis of the Relationship between Public Spending Components and Private Investments in Nigeria. *Journal of Finance & Economics*, 1 (2), 14–27.

Omojolaibi, J. A., Okenesi, T. P., and Mesagan, E. P. (2016). Fiscal Policy and Private Investment in Selected West African Countries. *CBN Journal of Applied Statistics*, 7(1b), 277–309

Ogujiuba, K., and Cornelissen, M. (2020). Macroeconomic Theory and Unemployment: A Comparison between the Keynesian and New Classical Model. *ActaUniversitatisDanubius. Economica*, Vol. 16, no. 2/2020, pp. 71-88.

Ohlin, B. (1937). Some Notes on the Stockholm Theory of Savings and Investment II. *The Economic Journal*. **47** (186): 221–240. doi:10.2307/2225524

Oskooee, B. M. and Oyolola, M. (2007). Export growth and output growth: An application of bounds testing approach. *Journal of Economics and Finance*, 31(1): 1-11.

Pesaran, M. H. and Shin, Y. (1999) *An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis*. In: Strom, S., Ed., Chapter 11 in Econometrics and Economic Theory in the 20th Century the Ragnar Frisch Centennial Symposium, Cambridge University Press, Cambridge, 371-413.

Pesaran, M. H., Shin, Y., and Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Economy*., 16: 289-326.

Phelps, E. (2022). Public Debt: My Dissent from "Keynesian" Theories. *Journal of Government and Economics*. Volume 5, Spring 2022.

Picarelli, M. O. and Vanlaer, W. and Marneffe, W. (2019). Does Public Debt Produce a Crowding out Effect for Public Investment in the EU? European Stability Mechanism Working Paper No. 36. http://dx.doi.org/10.2139/ssrn.3376471

Pollen, R. (2008). *Is Full Employment Possible under Globalization?* (Working Paper No. 144). University of Massachusetts: Political Economy Research Institution.

Rahman, M., Ullah, I., and Jebran, K. (2015). Effects of Government Expenditure on Private Investment: Evidence from Pakistan. *Journal of Basic and Applied Scientific Research*, 5 (2), 14–23

Ricardo, D. (1821). *The Principles of Political Economy and Taxation*. Dent, London. In Chapter XVII: Taxes on Other Commodities than Raw Produce.

Sam, C. Y., McNown, R., and Goh, S. K. (2019). An augmented autoregressive distributed lag bounds test for cointegration. *Economic Modelling*, Volume 80, August 2019, Pages 130-141

Shrestha, M. B., and Bhatta G. R. (2018). Selecting appropriate methodological framework for time series data analysis. *Journal of Finance and Data Science* 4 (2018).

Smith, A. (1776), *An Inquiry into the Nature and Causes of The Wealth of Nations*; Introduction by Robert Reich ; Edited, with Notes, Marginal Summary, and Enlarged Index by Edwin Cannan. New York :Modern Library, 2000.

Swaby, R. (2007). *Public investment and growth in Jamaica*. Fiscal and Economic Programme Monitoring Department, Bank of Jamaica.

Taylor, T. (2017). *Principles of Macroeconomics: Economics and the Economy* (Fourth ed.). Minneapolis: Textbook Media Press. pp. 366–340.

Tobin, J. (1965). Money and Economic Growth. *Econometrica*, Vol. 33, Issue 4, pp. 671- 684.

Tule, M. K., Audu, I., Oji, K. O., Oboh, V. U., Imam, S. Z., and Ajayi, K. J. (2015). Determination of the Floor and Optimal Threshold of Lending Rates in Nigeria. *CBN Working Paper Series.* CBN/WPS/01/2015/03.

Umaru, A. D. (2017). Deficit financing, price and economic stability in Nigeria: A bound testing approach. *CBN Bullion*, 41(3), 20-27.

Umaru, A.D., Aliero, H. M., and Abubakar, M. (2021). Budget Deficit and Economic Growth in Nigeria. *Economic and Financial Review*, Volume 59 Number 2 Article 2, 6-2021.

Vermann, E. K. (2012). Wait, Is Saving Good or Bad? The Paradox of Thrift. *Page One Economics, Economic Researc*h, Federal Reserve Bank of St. Louis. May 2012