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## Impact of Investment on Economic Growth in Nigeria

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### Abstract

*The study was conducted with the objective of investigating the impact of investment on economic growth in Nigeria, using time series data from National Bureau of Statistics and Central bank of Nigeria for the period 1981 – 2016. The study exploit the use of ARDL (2.2) mechanism and found out that both private and public investments are critical determinants of economic growth because in the short-run, they both exert positive influence and that, at the long-run, an interplay of forces may lead to crowd-out- effect except there is a strong institution to help stabilize the economy to restore equilibrium. The study recommend among other things; creation of conducive environment for investment to thrive, massive investment in infrastructure and the use of fiscal policy measures to reduce deficit-financing on the part of the public sector so as to encourage private sector participation in the economy to guarantee economic growth.*

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**Key words:** Public Investment, Private investment, Economic Growth, Autoregressive Distributed Lag

## INTRODUCTION

The role of investment in promoting economic growth across the world cannot be over emphasized. This is because investment has the tendency to increase output through employment and thus, generate income for the economy. It is one of the critical components of aggregate demand (AD) whose increase does help to boost aggregate demand and consequently economic growth. However, investment may be a source of macroeconomic instability if its level is not maintained at a constant rate that is sufficient enough to stimulate aggregate demand for the productivity it tries to create. For instance, for an economy that is close to full employment, a rise in AD will only cause inflation and not an increase in real GDP per se. On the other hand, economic growth referred to a steady course of action through which the productive capacity of an economy is improved over a period of time to bring about a rising level of real national output and income. Economic growth actually relates to growth in potential output at full employment

Apart from investment, there are other factors like consumer spending or exports that influence the level of aggregate demand. A drop in consumer spending or fall in exports does have a contractionary effect on AD, just like a rise in imports. In recognition of the critical importance of investment in promoting economic growth, almost all schools of thought in the field of economics have placed greater emphasis on investment as the engine room of economic growth. Accordingly, Keynes (1936) laid a key emphasis on investment and presented it as the most important factor that governs the level of spending in an economy even though it accounts for only about 20 percent (or less) of total spending.

However, this depends on the type of investment. For example, investment in human capita can increase labour productivity just as investment in new technology and acquisition of capital goods can increase the productive capacity of the economy. According to Pettinger (2008), this helps to shift aggregate supply (AS) curve to the right. An increase in AS can increase long term economic growth as well as increase growth without inflation. Any investment that brings about a significant increase in productivity can lead to an increase in the long-run economic growth. In the final analysis, investment is important in improving productivity and increasing the competitiveness of an economy. Without investment, an economy may only be "enjoying" a high level of consumption which could create an unstable economy and current account disequilibrium with little or no investment for future growth prospects. Following this introduction, the rest of the paper is divided as follows. Section two presents the literature review, section three gives the theoretical framework and methodology, section four presents the empirical results while summary and recommendations are presented in chapter five

## LITERATURE REVIEW

Conceptually, investment can be defined as an increase in capital spending such as buying new machines, building infrastructures and factories etc. through investment, the level of capital stock of an economy is augmented in such a way that the rate of growth of supply is equal to the rate of growth of capital stock. As Cornwill (2016) put it, the rate of growth of demand depends upon the rate of growth of investment or, more correctly, upon the rate of growth of non consumption expenditures. This implies that investment affects both demand and supply.

Being an engine of economic growth and development, the literature is replete with various empirical findings on the relationship between investment and economic growth. As noted by World Bank (1989) countries with relatively higher investment have the tendency to have a higher rate of growth of gross domestic product (GDP) than those with relatively low rate of investment. This means that most countries that grow steadily often invest a considerable proportion of their GDP while the reverse is the case for slow growth economies. Arguing from

the dependency theory perspective, Gobalet and Diamond (1979) found that poor nations experience significantly larger negative effects of investment dependence on economic growth than do rich nations. Their study tests the effects of investment dependence on economic growth and also explores the role of cycles in world political economy via an interaction effects. They found a highly significant interactive effect for national wealth and market size and concluded that those nations which rank both among the poorest and among the smallest (in their sample in per capita term) are those most adversely affected by investment dependence.

In most of the literature on the role of investment on economic growth, writers have emphasized the importance of investment in the process of economic growth and development. Findings from the studies often showed mixed results. While investment appeared to exhibit negative relationship with growth in some, it is largely positive in others. For example, Aschaver (1989a and 1989b) analyzed and estimated the productivity of public capital within an aggregate production function and found public capital to be a major and important determinant of economic growth. In another development, studies such as Ghali (1989), Ibrahim (2000) and Remitez and Nazini (2003) were of the view that public investment had a negative effect while private investment had a positive and significant impact on economic growth for the Malaysian and Latin American countries respectively.

In the case of Pakistan, Khan (1997), Khan and Sasaki (2001) and Sial, Hashmi and Anwar (2010) found that public investment significantly and positively contributed to economic growth. In the case of Sial et al (2010), economic growth was largely driven by private investment as compared to public investment and that government consumption expenditure, economic uncertainty and political instability hampered the economic growth of Pakistan.

Also, Anderson (1990) in a study of "investment and economic growth and development derived an accounting relationship between the rate of economic growth and variables that relates the rate of allocation and efficiency of investment and found that investment plays greater role in a country's growth if it is used efficiently to increase the level of output. Contrarily, investments that are inefficiently made results in lower rate of output growth.

In the case of China, Chow (1993) studied the role of capital formation and economic growth across five major sectors of agriculture, industry, construction, transportation and commerce and found the rate of returns to capital as 0.16, 0.20, 0.17, 0.26, 0.04 and 0.02 respectively in 1980. The findings revealed that between 1952 and 1985, China's aggregate income grew by an average rate of 0.06 and that capital growth rate increased by 0.076. Within the period of study, capital growth rate contributed to the growth of the economy by an average rate of 0.045.

In the case of Nigeria, Guseh and Oritsejafor (2007) in a study of "government size, political freedom and economic growth in Nigeria for the period 1960 - 2000 found a negative correlation between economic growth and investment. Also, Temidayo and Taiwo (2011) in a study of the "descriptive analysis of savings and growth in Nigerian economy for the period 1970 - 2006 found a negative relationship between investment and economic growth.

In some studies relating to group of countries, Khan and Reinhart (1990) in a study of "private investment and economic growth in developing countries" sampled 24 developing countries and applied a simple growth model to test the effect of private and public investment separately on economic growth. The findings show that private and public investments have different effects on the long-run economic growth. The results show that both private and public investment combined, plays larger and more important role in economic growth than public investment.

Relatedly, Potiovsky and Qayum (1992) studied the “effect of domestic capita formation and foreign assistance on the rate of economic growth” for 58 developing countries. Their results do not show any great effect of domestic capita formation and foreign assistance on per capita rate of growth for the period 1970 - 1980. Also, in a study of 101 countries, Bloomstorm, Lipsey and Zejan (1996) studied whether “fixed investment is key to economic growth” through the use of Granger-Sims Causality framework. Their results showed that growth has more causal effect on subsequent capital formation than capital formation on subsequent growth while fixed investment does not have a key role in economic growth.

These and many other studies have made useful contributions to the importance of investment in facilitating economic growth across the world. However, to the best of our knowledge, none of these studies emphasized the role of investment on economic growth within the framework of the Keynesian macro economy.

### THEORETICAL FRAMEWORK AND METHODOLOGY

Recent developments associated with endogenous growth theory have led a resurgence of interest in the theory of economic growth. While new growth theories have been developed exclusively within the context of neoclassical foundations, this study adopts the Keynesian theory of growth model developed by Palley (1996) as a framework for analyzing the relationship between economic growth and investment. One principal advantage of this “new” model is that it incorporates the mechanisms of endogenous growth which allows for endogenous variations in the rate of growth. Secondly, it recognizes that capital accumulation is driven by firms’ investment spending (rather than household saving behavior) which creates a point of entry for aggregate demand factors to affect investment spending to result to the rate of growth through technological progress. The starting point is to reformulate the Solow (1956) growth model such that investment determines the rate of capital accumulation. By reformulating the fundamental equation of motion governing the evolution of capital-labour ratio and adding an equation determining the level of investment spending per worker, the capital deepening equation is defined by  $\dot{K} = I - (d + n + \alpha)K$  with an investment function  $I = z(r)f(k)$  while the interest rate equation is  $r = f_k$  to generate an output growth as  $g = n + \alpha + (f_k K / f(k)) K / K$ .

The above model is formally similar to the Solow model subject to change that firms’ investment spending determines the path of capital accumulation, with savings accommodating investment. The stability of the model requires that the rate of increase in investment spending decrease as the capital stock per worker increases. Therefore, the stability condition is  $d^2 I / (dk^2) = z f_{kk} + 2z_r f_{kk} f_k - f(k) z_r f_{kk} < 0$ . This results in a steady-state capital-labour ratio and growth rates defined by  $k^1 = k(\bar{\alpha}, \bar{n}, \bar{\alpha})$  and  $g_y = n + \alpha$ . As a result, the natural channel for incorporating a role for aggregates demand (AD growth is to have it influence investment as  $I = z(r_y g_D) f(R)$  where  $z_r < 0$  and  $z_{gD} > 0$ . Meaning that aggregate demand exerts a positive influence on the flow of investment spending per worker. Consequently, introducing AD growth calls for a theory of AD growth which must also provide explanation as to how AD growth is brought into balance with output growth which is the hallmark of Keynesian economics.

After all necessary adjustments through financial market as contained in Palley (1996) the mechanism of endogenous growth can be understood from specifying the technical progress function as  $\alpha = A k^b f$  such that  $A > 0$ . The most important feature of this specification is that the rate of technical progress is now endogenously determined. This is the core innovation behind the theory of endogenous growth. The emergence of a Keynesian model of growth follows a combination of a technical progress function with an investment function in which investment spending is driven by aggregate demand. In the Keynesian theoretic growth model, the financial



distributed lag (ARDL) model is used to serve as a general compromise to providing a useful platform for studying the impact of investment on economic growth in Nigeria. As a result, equation (2) is re-specified as:

$$RGDP = \beta_0 + \beta_1PUBINV_t + \beta_2PRIINV_{t-1} + \beta_3PRIINV_{t-2} + \beta_4PUBINV_t + \beta_5PUBINV_{t-1} + \beta_6PUBINV_{t-2} + \lambda_1RGDP_{t-1} + \lambda_2RGDP_{t-2} + \epsilon_t - -3$$

In which  $\epsilon_t$  is assumed to be serially uncorrelated and homoscedastic and as such the mean of the disturbance term is not only consistent, but super consistent. Equation (3) is estimated using the logarithms of real gross domestic product and private and public investment respectively so that the estimates of the parameters follows an ARDL (2,2) model. In this case, the stability of the model satisfies the condition  $|\lambda| < 1$  which is necessary to make the model well-behaved.

**RESULTS AND DISCUSSION**

**Unit Root (Stationary) Test**

Although, ARDL model do not require pre-testing, the study carried out a unit root test in other to determine whether (or not) the variables are stationary. The results of the unit root test are presented on the table below:

**Table 1: Results of Unit Root Test**

Variables	Critical value at 5 percent	ADF Test value at 5 percent	Status
RGDP	- 2.9527	- 3.091784	I(1)
PRIINV	- 2.9527	- 3.372560	I(1)
PUBINV	- 2.9527	- 3. 829352	I(1)

Source: Author's Computation, (2018)

The results of unit root test as presented above shows that all the variables are integrated of order I. That is I(1)). As a result a test of co-integration based on Johansen (1991) and Johansen and Joselius (1990) was performed in other to determine whether there exist, long-run relationship among the variables. Results of Co-integration test are contained on the table below:

**Table 2: Co-integration Test with Trace Statistic**

Hypothesized No of CE(s)	Eigen value	Trace Statistic	5 percent critical value	1 percent critical value
None**	0.586815	37.83163	29.68	35.85
At least 1	0.217976	8.664288	15.41	20.04
At most 2	0.016545	0.550563	3.76	6.65

Source: Author's Computation, (2018)

Note: (\*\*): denotes rejection of the hypothesis at the 5 percent and 1 percent level.  
 (2) : Trace test indicates 1 co-integrating equation at both 5 percent and 1 Percent level.

**Table 3: Co-integration Test with Maximum Eigen value Statistic**

Hypothesized No of CE(s)	Eigen value	Max-Eigen value	5 percent critical value	1 percent critical value
None**	0.586815	29.16735	20.97	25.52
At least 1	0.217976	8.113725	14.07	18.63
At most 2	0.016545	0.560563	3.76	6.65

Source: Author's Computation, (2018)

Note: (\*\*): denotes rejection of the hypothesis at the 5 percent and 1 percent level.  
 (2) : Maximum Eigen value test indicates 1 co-integrating equation(s) at both 5 percent and 1 percent level.

Both the Trace statistic and the maximum Eigen Value statistic as presented above shows the presence of co-integration among the variables. In both tests, the co-integrating vectors were selected and the result considered that there existed, maximum of two co-integrating vector in

the growth model. While, the Maximum-Eigen value statistic examines the null hypothesis of  $\rho^{\text{th}}$ -order co-integrating vectors against the alternative of  $r + 1$  vector, the Trace statistic provides a test of a more general alternative hypothesis.

Table 4: Estimation of the ARDL model

Dependent Variable: Real GDP

Variable	Coefficient	Std Error	t-Statistic	Prob.
RGDP <sub>t-1</sub>	1.076606	0.115979	9.262761	0.00004
RGDP <sub>t-2</sub>	- 0.039759	0.055164	- 0.720744	0.4775
PRIIVN <sub>t</sub>	0.017026	0.077391	0.219994	0.8276
PRIIVN <sub>t-1</sub>	0.016534	0.040478	0.408476	0.6863
PRIIVN <sub>t-2</sub>	- 0.002766	0.030916	- 0.089458	0.9294
PUBIVN <sub>t</sub>	0.021909	0.030376	0.721264	0.4772
PUBIVN <sub>t-1</sub>	- 0.105982	0.075892	- 1.396482	0.1744
PUBIVN <sub>t-2</sub>	0.047163	0.068469	0.806634	0.4272
C	- 0.115752	0.615806	- 0.187968	0.8624
<b>R-Squared</b>	0.992831	Mean Dep. Variable		7.483143
<b>Adjusted R-Squared</b>	0.990625	SD dep. Variable		0.208027
<b>Squared</b>	0.020142	Akaike Inf. Criterion		- 4.754948
<b>S.E of Regression</b>	0.10549	Schwarz Criterion		- 4.355001
<b>Sum. of Sq. resid.</b>	92.21169	F-Statistic		450.0712
<b>Log Likelihood</b>	1.785072	Prob. (F-Statistic)		0.000000
<b>Durbin-Watson Stat.</b>				

Source: Author's Computation, (2018)

Note: Significance at 5 percent level.

The regression estimates as presented in table 4 above were carried out in line with the empirical model as specified in equation (3). The estimations were performed at 5 percent level to show the relationship between private and public investment and economic growth in Nigeria. The Least Squares estimates were statistically high and significant. The coefficient of determination, defined by R-squared which measures the goodness of fit of the model was equally high, explaining about 99 percent of the total variation in economic growth are explained for, by the level of investment in the country. This implies that investment is a critical factor that influences the growth of an economy. Equivalently, the F-statistic which measure the overall significance of the model was equally high while the value of the Durbin-Watson statistic shows that autocorrelation was not a problem. The value of the constant parameter was negative, indicating that economic growth would be negative in the absence of investment.

On the whole, the model provides overwhelming evidence that economic growth would rise by about 2 percent for every one unit change at both the current and previous year's level of private investment, holding public investment constant. However, any crowding out policy of the government would have a negative impact on private investment as the country move backward into a distance past.

Relatedly, the result shows that economic growth rise by about 2 percent at the current year and 4 percent in two years prior, for every one unit change in public investment, holding private investment constant and that any policy of the government to encourage private investment would reduce public investment by about 10 percent during the immediate past year.

The coefficient of both ECM (-1) and ECM (-2) showed the rate at which RGDP would return to its long-run equilibrium position after a deviation from the steady state. The estimate ECM (-2) show that about 3 percent of the disequilibrium in RGDP would be corrected in two years. This is rather a slow movement to a long-run steady state.

## CONCLUSION AND RECOMMENDATIONS

This study was conducted with the objective of investigating the impact of investment on economic growth in Nigeria for the period 1981 and 2016. An autoregressive distributed lag, ARDL (2,2) mechanism was employed to estimate the data. Results showed that economic growth was largely driven by a combination of both private and public investment with a strong tendency of the public investment leading the way for the private sector investment to follow. In the short-run, both private and public investments positively influence economic growth and at the long-run, interplay of forces between private and public investment would lead to a crowd out effect unless there was a strong institution to regulate the economic structures to bring about economic stability and sustainability.

Based on the above findings, the following recommendations are made:

- (a) There is the need to create conducive environment for both private and public investment to thrive towards guaranteeing economic growth.
- (b) There is the need for massive investment in infrastructure by the public sector to enable private sector participation in the economy.
- (c) There is the need for fiscal policy of the government to be targeted towards reduction of expenditures on non-productive sectors of the economy to reduce deficit financing which may crowd out the private sector investment.

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