

Analysis of the Determinant of Private Investment Behaviour in Nigeria Between 1984 and 2016

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ABSTRACT

The study carried out a trend analysis of private investment, examined the factor that determines private investment behaviour, and compared the relative effectiveness of the factors that determine private investment decision in Nigeria. Data for the study are sourced from the Global Development Network Database of World Bank, and seven variables are identified as determinants for estimation. The estimation techniques adopted for this study are the panel data error correction approach which uses structure dynamics. The study, therefore, recommended that effort should be made in Nigeria to increase the real factor of the economies to promote real domestic output that will attract and enhance accelerated private investment. Also, investment policy framework should be based on short-term target than long-term targets because most of the identified determinants were significant on the short run.

Keywords: behaviour, determinant, investment, private.

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INTRODUCTION

Investment is regarded as one of the key determinants of an economy's long-run growth in this present world [1]. In view of the importance of investment to economic development to every nation, governments of the various African countries have recognized the challenges posed by the current pattern of investment growth and have renewed their political commitment to economic transformations at all levels. At the national level, numerous nations have additionally made monetary change a key focal point of their advancement motivation in the medium to long haul. For instance, the Ethiopian government has a development and change plan-went for boosting interest in agriculture and industrialization. Cote d'ivoire has an economic emergence strategy went for making it a modern economy by 2025. Similarly, Uganda expects to quicken its

financial change through vision 2030, and Lesotho's vision 2020 offers a need to mechanical advancement. Nations, for example, Kenya, Zimbabwe, Rwanda, Mali, South Africa, Nigeria and Egypt, among others, have additionally created plans and procedures to change the structure of their economies towards interest in assembling and agro-partnered-related enterprises in the medium to long haul [2]. A key test confronting these nations is the way to change over their vision of monetary change into "reality". Obviously, this requires a comprehension of the drivers of auxiliary change in the advancement procedure [2].

A close look at the investment profile of Nigeria indicates a relatively low investment rate compared to the developed economies. In Nigeria, private investment declined from 10.1% of GDP in 1999 to

9.6% in 2003. This was because of the decrease in public investment which declined over the same period. Private investment then increased to 9.9% in 2006. Thereafter, it declined continuously to 8.6% for three consecutive years (2007–2009). The ratio increases again to 10.2% in 2010 and declined slightly to 10.0% in 2011 [3].

Statement of the Problem

In view of the perceptible slide and disparity in the ratio of private sector investment to GDP across the continent despite the emphasis on private investment and various reforms which did not yield the desired result, it is, therefore, imperative to identify the perceived determinants of private investment in Nigeria; and therefore, analyses which of the identified factors that positively or negatively impact on private investment among the different economic in Nigeria.

Based on the issues discussed above, the following research questions were raised:

- (1) What are the perceived determinants or drivers of private investment in Nigeria?
- (2) Which of these drivers is/are responsible for low level of private investment in Nigeria?
- (3) What is the relative effectiveness of investment growth in Nigeria economy?

Objectives of the Study

The broad objective of the study is to examine the “factors that determine private investment behaviour in Nigeria between 1984 and 2016. The specific objectives are to:

- (i) Analyse the trend of private investment in sub-Saharan African (SSA) countries.
- (ii) Examine the factors that determine the performance of private investment in Nigeria.

REVIEW OF LITERATURE

Investment from a macro-economic standpoint is the purchase of goods that are not consumed today but are used to create further capital (wealth). Investment is a component of aggregate demand and hence it is an important determinant of the general level of economic activity. A small change in the rate of investment can create much larger fluctuation in national income, employment and other aggregate economic data. These fluxes in national economic activities have major implication for government economic policies. Investment and development have a strong relationship with each other. Without investment, development and progress are not possible [4]. Investment spending provides the basis for economic growth and improves national capacity and productivity. The growth of economic productivity and capacity can produce more output for domestic need and promote the export of goods [4].

Investment is generally classified into four major components: private domestic investment, public domestic investment, foreign domestic investment and portfolio investment. Private domestic investment refers to gross fixed capital formation plus net charges in the level of inventories, whereas public investment includes investment by government and public enterprises on social and economic infrastructure, real estate and tangible assets [5]. The combination of private investment and public investment is normally referred to as gross fixed capital formation to distinguish them from their counterpart foreign investment. The foreign investment when it is tangible assets is referred to as direct foreign investment. It is called portfolio investment when it is on shares, trade, securities, etc. Private investment has a stronger, more favourable effect on growth rather than government investment, probably because private investment is more efficient and less closely associated

with corruption. It is estimated that the ratio of private investment to GDP in Nigeria had experienced poor rates of growth since the 1980s was less than 10% [5].

There are two categories of private domestic investment: fixed investment and change in private inventories. Fixed investment is the category that includes the capital goods that best reflect what most people consider as capital investment, and it is generally about 95%–97% of gross private domestic investment. This category includes factories, machinery, tools and buildings. More specifically, fixed investment is divided into two major subcategories: non-residential and residential; change in private inventories is investment by the business sector in the stocks of finished products, intermediate goods, raw materials and other inputs that businesses keep on hand to use in production. Inventories also include final goods that have been produced but remain unsold. These are considered investment because just like businesses need factories and equipment to produce goods, they need inventories to smooth the flow of production and sales. In fact, inventories are frequently termed "working capital" [1].

Private investment is a strong tool for innovation, economic growth and poverty reduction. Countries with the wider and deeper private sector investment demonstrate accelerated growth, creates more job opportunities, generate more revenue, and increases income of the poor; so, it is very essential for an economy to increase its investment in private sector. Broad consensus has emerged on the importance of increasing total investment and promoting private sector development and increasing its share of total investment for long-term growth. But in many developing countries, investment rates are too low. Incentives for innovation are insufficient and even returns on investment

are not so predictable which is the major cause of slow growth of developing economy [2].

Johansen [6] analysed the determinants of private investment after the introduction of the multi-currency system in Zimbabwe for the period 2006–2011. The study employed correlation and multiple regressions. Variables identified for the study include political risk, GDP, national savings, inflation, interest rates, public investment, terms of trade and debt servicing. The study identified political risk, interest rate, GDP, debt servicing and trade terms as key "determinants of private investment" over the study period. In a bid to foster economic growth and increase private investment, the study suggested the promotion of political stability, the attraction of FDI, enabling a structured public–private dialogue and promoting Government investment in infrastructure development among others.

Johansen [6] examined the capital accumulation in sub-Saharan Africa involving income-group and sector differences with a sample of 25 SSA countries during structural adjustment era with dataset from 1980 to 2004. The study employed regression analysis to estimate empirical specifications of private capital in the primary industry and service sectors. The results indicated that the level of GDP per capita, quality of governance and public capital stock were found to be positive and significantly influence the private capital accumulation reflecting the complementary effects between public and private investments. No statistically significant relationship existed between GDP per capita and private capital in the primary sector. The study also found private investment in both the primary sector and the industrial and service sectors to be largely driven by public capital and profitability shock.

Hall and Jorgenson [7] examined the relationship between private investment and economic growth for a sample of 59 developing countries between 1980 and 1999 using panel analysis. The findings showed that private investment had a dynamic effect on economic growth rate. It is, therefore, important that if efforts are geared towards improving the perceived factors that determines investment, it will have a positive effect on economic growths.

Haroon and Naser [5] carried out a study into the relative productivity of public and private investments in developing countries. His source of data on aggregate public and private investments for 48 developing countries came from the previous study done by Hall and Jorgenson [7]. Data estimation was prepared for 41 countries over the period ranging from 1973 to 1980. In addition, the study also covered the period from 1980 to 1990, and separate estimations were done for sub-periods from 1980 to 1985 and 1985 to 1990. Econometric results from this study revealed discrepancy between the study periods 1970 and 1980. For the 1970s, private investment appeared to be relatively productive than public investment. On the contrary, public investment was more productive in the 1980s than private investment. The study, therefore, implied that public resources were invested in productive activities of the economy and a slowdown of balancing inputs for the private investment. The study advised researchers to be cautious in claiming that private investment is more productive than public investment.

Ghali [8] conducted a research on Tunisia using [3, 7] multivariate co-integration techniques and in which a vector error-correction model of growth was developed to study the temporal causal dynamics between the private and public

investments. The study period ranged from 1963 to 1993 using real GDP, real private investment and real government investment in the estimation. Ghali's study found a negative reaction on private investment whenever there is a change in public investment with two-time intervals. It implied that investment in the public sector of the economy had a crowding-out effect on private investment. This finding was backed by evidence of government investment in public sectors claimed to be weak including agriculture, manufacturing, energy, banking and financial services which reduced the chances for private investment.

Ghali [8] analysed the effect of private investment on growth in developing countries using the Harrod–Domar growth model. The study found that Harrod–Domar and Solow models make no distinction between public and private investments and their definite effect on growth. Rather, they are both treated as investment. Meanwhile, the study summarized that theoretical hypothesis supports the notion that private sector investment has more effect on growth than public investment. However, there are scarce-proven empirical evidences to support these facts.

RESEARCH METHOD

Theoretical Framework

There are many theories on determinants of investment behaviour. However, out of these theories, flexible accelerator theory is applied being the closest theory to the model to be used in this research work.

Flexible Accelerator Theories

The accelerator principle states that an increase in the rate of output of a firm will require a proportionate increase in its capital stock. The capital stock refers to the desired or optimum capital stock, K . Assuming that capital–output ratio is

constant v , the optimum capital stock is a constant proportion of output so that, in any period t ,

$$K = vY \quad 1.1$$

where, K_t is the optimal capital stock in period t , v (the accelerator) is a positive constant, and Y is the output in period t .

Any change in output will lead to a change in the capital stock. Thus,

$$K_t - K_{t-1} = v(Y_t - Y_{t-1}) \quad 1.2$$

Note that the change in capital = investment;

i.e., $\Delta K = I$

Therefore, $I = K_t - K_{t-1}$

$$I_t = v(Y_t - Y_{t-1}) \quad 1.3$$

where, $\Delta Y_t = Y_t - Y_{t-1}$, and I_t is the net investment.

In Equation 3.3, the level of net investment is proportional to the change in output. If the level of output remains constant ($\Delta Y = 0$), the net investment would be zero. For net investment to be a positive constant, the output must increase.

The flexible accelerator theory was originated by Folawewo and Tennant, and Johansen [6, 9]. The theory overcomes one of the major deficiencies of the simple accelerator, which states that “capital stock is always optimally adjusted”. In the flexible accelerator model, capital is adjusted towards its desired level and so the firm's net investment is proportional to the change in desired capital [8]. The model is a partial adjustment model, and just like the adaptive expectations model, it is a theoretical justification of the Koyck model [2]. Under the partial adjustment process, capital stock is adjusted towards a proportion of its desired stock since the adjustment is not instantaneous. It is assumed that there is an optimal or desired equilibrium amount of capital stock

required to produce a given level of output. The demand for capital increases when the demand for output accelerates, hence the name accelerator model [3].

To move from the actual change to the desired change, the partial adjustment mechanism principle is applied such that:

$$K_t - K_{t-1} = \delta(K_t^* - K_{t-1}) \quad 1.4$$

$$0 < \delta < 1$$

where, S measures the speed of adjustment, K is the actual capital in period t and K_t^* is the desired capital in period t . This flexible accelerator mechanism can be transformed into a complete theory of investment behaviour by adding a model of replacement investment and a specification of the desired level of capital such that:

$$K - KM = \delta K_t^* - \delta K_{t-1} \quad 1.5$$

$$K = \delta K^* + (1 - \delta) K_{t-1} \quad 1.6$$

$$K = (1 - \delta)K + I \quad 1.7$$

The capital stock equation can be written as follows:

$$K_t = (1 - \delta)K_{t-1} + \delta Y_{t-1} + \beta K_{t-1} \quad 1.8$$

$$= [(1 - \delta)K_{t-1} + \beta K_{t-1}] + \delta Y_{t-1} \quad 1.9$$

$$= K_{t-1}[(1 - \delta) + \beta] + \delta Y_{t-1} \quad 1.10$$

$$\text{or } K_{t-1} = K_2[(1 - \delta) + \beta] + \delta Y_{t-2}$$

The national income equation is

$$Y_t = I_t + C_t$$

$$C_t = aY_{t-1} + bK_{t-1}$$

$$I_t = \alpha Y_{t-1} + \beta K_{t-1}$$

$$Y_t = \alpha Y_{t-1} + \beta K_{t-1} + aY_{t-1} + bK_{t-1} \quad 1.11$$

$$Y_t = \{[\alpha Y_{t-1} + aY_{t-1}] + [\beta K_{t-1} + bK_{t-1}]\}$$

$$Y_t = (\alpha + a)Y_{t-1} + (\beta + b)K_{t-1} \quad 1.12$$

By substituting the value of KM in Equation 3.12,

$$Y_t = (\alpha + a)Y_{t-1} + (\beta + b)[K_{t-2}(1 - \delta) + \beta] + \alpha Y_{t-2}$$

$$Y = (\alpha + a)Y_{t-1} + (\beta + b)[\alpha Y_{t-2}(1 - \delta) + \beta]K_{t-2} \quad 1.13$$

Again, the national income Equation 3.12 can be written as follows

$$Y = (\alpha + a) Y_2 + (\beta + b) K_{t-2}$$

$$\text{or } (p + b) K_{t-2} = Y - (\alpha + a) Y_2$$

Having obtained the value of $K - 2$, substitute it in Equation 1.3:

$$Y = [(\alpha + a)Y_{t-1} + (\beta + b)Y_{t-1}] + [\alpha(\beta + b)Y_{t-2} - (\alpha + a)(1 - K + \beta)Y_{t-2}]$$

By taking common factors, we have

$$\begin{aligned} Y_t &= [(\alpha + a)Y_{t-1} + (1 - K + \beta)Y_{t-1}] + [\alpha(\beta + b)Y_{t-2} - (\alpha + a)(1 - K + \beta)Y_{t-2}] \\ &= (\alpha + a) + (1 - K + \beta)Y_{t-1} + [\alpha(\beta + b) - (\alpha + a)(1 - K + \beta)Y_{t-2}] \end{aligned} \quad 1.14$$

Equation 3.14 is the generalized version of a flexible accelerator process. In a simple model of accelerator theory, the investment equation takes the following form, whereas, in the flexible accelerator model, the investment equation is in this form:

$$I_t = \alpha Y_{t-1} - K_{t-1} \quad 1.15$$

where the value of parameter $p = -1$ and investment is regarded as net investment so that $k = 0$.

$$-I_t = \alpha + \beta Y_t + et \quad 1.17$$

where I_t is the investment in levels, a and p are parameters to be estimated, Y is defined as observable variable representing factors affecting investment in year t , and et is a random error term with a mean of zero, representing measurement error and unmeasured and immeasurable factors.

Model Specification

Based on the theoretical review and empirical considerations, the following basic functional model incorporating accelerator, neoclassical and uncertainty (macroeconomic and political) variables are posited for this study $INV = f(RGDP, CRE, INFL, RIR, REX, OPENNESS, ELE)$ 18

where

INV is the private investment. It is obtained by taking gross-fixed capital formation in the private sector minus foreign direct investment.

RGDP is the real gross domestic product (proxy for demand conditions in the economy).

CRE is the credit to private sector (proxy for liquidity constraints). It is measured by changes in domestic credit to the private sector.

INFL is the rate of inflation.

RIR is the real interest rate (proxy for user cost of capital).

REX is the real effective exchange rate.

OPENNESS is the trade openness. This is measured by the ratio to the sum of export and import to real GDP.

ELE is the electricity consumption / generation.

The explicit econometric model of Equation 3.18 is formulated as follows:

$$\begin{aligned} \text{LINV} = & \alpha + \beta_1 \ln \text{RGDP}_{i,t} + \beta_2 \text{LCRE}_{i,t} + \beta_3 \text{LINF}_{i,t} + \beta_4 \text{LRIR}_{i,t} + \beta_5 \text{LREX}_{i,t} \\ & + \beta_6 \text{LOPENNESS}_{i,t} + \beta_7 \text{LELE}_{i,t} + ut \dots \dots \dots 1.19. \end{aligned}$$

where all variables are as defined above except ut which represents the usual error term, t is the time and $\ln$ is the natural logarithm,

Panel Unit-Root Test

The panel unit-root test explores the data characteristics of the panel before proceeding to the panel co-integration test. The idea here is to test for stationarity of each variable used in the study. According to Kumar and Pradhan [10], a variable may not be stationary, but a linear combination of the non-stationary

variables may be stationary, hence the need for co-integration. The method of panel unit-root test adopted for this study is Im, Pesaran and Shin (IPS) test. The test has been proven to be suitable in verifying stationarity of variables in panel data [10, 11]. The basic IPS specification is given by. where, ρ_0 is the constant, x_{it} represents the explanatory variables, y_{it} is the explained variable, π is a time trend and p is the required lag length. The null hypothesis to be tested for the IPS is $H_0: \alpha_i = 0$, for all i 's while the alternative, 1 hypothesis is $H_1: \alpha_i < 0$, for at least one i . The lag lengths are selected using the Akaike Information Criterion. According to Misati [12], all series must be largely non-stationary series, i.e. $I(1)$ before a panel co-integration test can be carried out.

RESULT AND DISCUSSION

Panel Unit Root

This section presents data analysis and interpretation of the panel empirical results. We start by exploring the panel dimension of our data to understand the

individual nature of the variables and to ascertain their suitability for the estimating technique adopted. This is done through the test for stationarity which is also known as the unit-root test. As explained in the methodology, determination of the order of integration is very important before embarking on the panel co-integration test. A non-stationary series contains unit roots and such series has the tendency of sustaining shocks. The reverse is the case for a stationary series, i.e. a series that does not contain unit roots. It is important that all the series are integrated of the same order before the error-correction-based panel co-integration can be applied. Consequently, our first task is to perform the unit-root test and determine the order of integration of all variables. In recent panel studies, there are two well-established and appropriate unit-root tests: the Im Peterson and Shin (IPS) test and the Augmented Dickey Fuller (ADF)–Fisher CM square unit root test [13–15]. Therefore, this study employs two types of unit-root tests as mentioned in Table 1.

Table 1. IPS and ADF–Fisher Chi-square unit-root tests.

Variable	IPS unit-root test			ADF–Fisher Chi-Square Unit-root test		
	<i>t</i> * Statistics	P-value	Order of integration	<i>P</i> * Statistics	P-value	Order of integration
Lprinv	−6.4233	0.000***	I(0)	780.9557	0.000***	I(1)
Ltop	−5.5368	0.000***	I(D)	577.2505	0.000***	I(1)
Lrgdp t	−5.1262	0.000***	KO	483.6977	0.000***	I(1)
Lcre	−4.6145	0.006***	KD	420.6924	0.000***	I(1)
Lextr	−4.2781	0.000***	I(1)	333.1698	0.000***	I(1)
Lintr	−6.1824	0.000***	I(0)	693.6363	0.000***	I(1)
Lele	−6.0947	0.000***	KD	687.5778	0.000***	I(1)
Linf	−6.1675	0.000***	Ki)	765.9801	0.000***	I(1)

Source: Author computation.

Note: ***, ** and * represent statistical significance at 1%, 5% and 10%, respectively. Each model includes trend and constant terms.

Table 1 shows the result of the unit-root test. The series are integrated of order one, i.e. 1(1), except the interest rate which is stationary at level under IPS unit-root test only. Having ascertained the nature of the panel data regarding all the series used in our study, we treat all the variables as 1(1). Moreover, ADF–Fisher test has been identified as a better test of unit-root test in panel data because it doesn't impose stringent measures like IPS where the panel must be balanced before it can be applied. Again ADF–Fisher also permits of different lag lengths in the ADF regression.

CONCLUSIONS

The study confirmed the existence of long-run relationship between private investment and its determinants, and the *R*-square of the long-run equation shows that these determinants collectively can influence private investment in the Nigeria significantly, notwithstanding the long-run relationship appears to be rather weak because only one out of the four panel tests of co-integration affirms the existence of long-run relationship. It can be concluded from the results that real output is the most important factor affecting private investment in Nigeria. The findings from this study have shown that there is a strong linkage between real output and investment in the Nigeria. According to the result, the effect of real output on private investment is sustained from the short run through the long run; meaning that real output has significant transitory and permanent impacts on private investment in Nigeria. The SSACs appear to have been shown as dominated mostly by consuming nations rather than producing nations. This is evident in the trade openness relationship with private investment which is significantly negative. The implication is that the more opened the Nigerian economy, the more the detrimental effect it has on private investment and the domestic economies.

The findings from this study appear to have supported the discouragement of over-valuation of domestic currencies in Nigeria. It has been confirmed from some empirical works that over-valuation of currency is capable of, squeezing out the tradable sector of the domestic economies of Nigeria and it should be guided against. In addition, interest rate shows a significant inverse relationship with private investment only in the short run. Therefore, this study appears to be supporting the school of thought that favoured super-neutrality of money where monetary policy variables are said to be having only transitory impacts on output variables. The study has confirmed that the interest rate only has significant transitory impact on investment in Nigeria.

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