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PRIVATE SECTOR INVESTMENT AND ECONOMIC GROWTH IN NIGERIA: A CASUAL RELATIONSHIP INVESTIGATION (1980-2014)

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ABSTRACT
This study examines the relationship between private sector investment and economic growth in Nigeria, based on OLS and Granger Causality test. The preliminary analysis of OLS findings established that some of the selected indicators of privately investment – foreign direct investment and Gross capital formation - in the long-run, were positively related with GDP but only foreign direct investment is significant. Inflation rate, credit to private sector and national savings were inversely related with GDP. These findings imply that credit to private sector and Gross capital formation do not adequately complement economic growth while inflation constitutes constraint to income drivable from private investment and ultimately, economic growth. The Granger Causality test established that only foreign direct investment indicator have bilateral relationship with GDP while economic growth precedes capital formation and inflation rate indicators and there was no evidence of feedback, implying unidirectional relationship with GDP. This indicates that the rate of capital formation and inflation rate determine the rate of the country's economic growth. Others are independent. The result is therefore inconclusive, implying that private sector investment indicators do not adequately determine economic growth. Overall, the import of these results implies that the level of private investment in Nigeria is low and so, adversely influences economic growth. The study therefore recommends that government should strive to achieve sustainable price stability, economic efficiency driven by infrastructural development and enhanced technological capabilities to boost private sector production capacity and ultimately real GDP.

Key words: Private Investment, Economic Growth and Granger Causality tests.

INTRODUCTION
In recent times, the Nigeria government has been in the fore front in growing her economy and among her cardinal economic objectives as a developing nation, is fostering sustainable economic growth but the economy has continued to witness a low pace of growth. Many reasons have been advanced for this development but apparently poor investment climate has been attributed to many factors which include: low level of investible funds, government excessive fiscal deficit, macroeconomic instability, poor savings culture, among others. Some lessons of experience have shown that government alone cannot drive the economy. Consequently, an insight into the impact of private

sector investment on economic growth in Nigeria has become pertinent in order to hasten the achievement of the objectives of this strategy.

Nigeria has been classified as a low savings and even lower investment country (Ajakaiye, 2000 and Nnenna et al, 2004), despite her vast mineral resources, favourable climate and good vegetation features. She has the largest and potentially attractive domestic market to attract both domestic and foreign investment in the sub-Saharan Africa yet, her performance in terms of private investment and ultimately economic growth, has remained very sluggish.

Secondly, high rate of unemployment and abject poverty among greater percentage of her populace have also been attributed to low investment expenditure within the economy. To get out of this low-investment trap, it has become necessary to identify the major factors, which are responsible for this trend, in order to enhance economic growth. Furthermore, with the incessant occurrence of oil glut price, there is need to diversify into and boost the private sector investment.

However, some economic scholars are of the view that the problems of Nigeria's sluggish investment growth have not been well-understood and well-managed. Most of the reviewed studies have some methodological and conceptual problems that undermine their accuracy. For instance, the use of traditional correlation method that measures only the linear relationship which does not necessary imply causation or direction in any meaningful word, Zellner (1979), and the use of cross-country analysis that precludes the country specific, may all lead to bias inferences, Engel and Granger (1987) Gujarati (2009), Blonigen and Wang (2005).

Recognizing the above gaps and challenges of the previously reviewed studies, there is need to reexamine the problem holistically by applying Nigerian time series using Granger Causality tests to see if a more improved result Granger Causality tests to see if a more improved result could be achieved for effective economic planning.

The main objective of this study is therefore, to empirically establish the impact of private sector investment on Nigeria's economic growth by examining the nature of direction of causality between economic growth and some selected private sector investment indicators and also identify other factors that constrain investment output growth. This is the first step to solving the problem.

To achieve this objective, the following hypotheses are formulated to aid the analysis:

1. There is no causal relationship between economic growth and the selected private sector investment indicators namely: Credit to Private sector, Gross Capital Formation, Foreign Direct Investment , national savings and inflation (constraint)
2. There is no significant long run relationship between economic growth and some selected private sector investment indicators as listed above.

The paper is structured as follows: Section I which precedes four other sections, introduces the study. Section II discusses the related reviewed literature. Section III provides the methodological issues. Section IV presents and analyses the data while section V concludes the study with policy recommendations.

2.0 Review of Related Literature

2.1 Conceptual Issues on Investment and Growth

The term, private investment, can be broadly defined as acquisition of an asset by non-public or non-governmental groups or individuals with the aim of receiving a positive return. It could also mean the production of capital goods, which are not consumed but instead used in future production. Investment is also usually measured in terms of physical capital formation, in which case, investment is regarded as an addition to the stock of capital. In other words, Gross capital accumulation is the driving force of any national investment. (Quattara, 2005).

At the macroeconomic level, investment expenditure in Nigeria in terms of financing is structured into domestic and foreign segments depending on sources of finance and to a lesser extent, management. At the domestic level, investment is further categorized into public and private sector investment expenditure. Foreign investment may also include foreign direct investment, foreign private investment and portfolio investments, whether such expenditure is financed by private or official sources of capital. Investment could also be evaluated from the sectorial distribution point of view, in which case, each group of activity sector of the Gross Domestic Product (GDP) is examined to measure the quantum of investment expenditure received over time. In this categorization, the structure of investment which is Gross Capital Formation is composed of building and construction, land development, transport, machinery and equipment and breeding stocks. (Nnenna et al, (2004) and Mordi et al (2010).

On the other hand, the apparent consensus suggests that economic growth refers to positive increase in the aggregate level of output produced within a given time period in a country. (Yesufu, 1996). However, the concept of economic growth has not been quite easy to grasp and measure in real terms. This is so because often on the literature of economics, some authors have variously differentiated economic growth from the "economic development" Economic growth and development are two terms sometimes used interchangeably, but they differ in context.

Economic development is seen as an increase in the aggregate level of output and incomes with due consideration given to the quality of life that hopefully takes into consideration the distribution of income, healthcare, environmental degradation, global pollution, freedom and justice, etc. Therefore, economic development could be referred to as a process by which an economy experiences three main ph

enomena namely – sustained growth in output, structural changes and instructional changes, Woodford et al (2000). The term 'economic growth', is used throughout in this text as already stated.

2.2 Theoretical Issues on Economic Growth

The framework for understanding growth over the long-term is rooted in two main theories that relates to possible sources of growth. These are the growth theory and the growth accounting. Growth theory is concerned with the theoretical modeling of the interactions among growth of factor supplies, savings and capital formation, while growth accounting addresses the qualification of the contributions of the different determinants of growth.

Three waves of interest have currently emerged in studying growth. The first wave is the linear-stages growth theory which is associated mainly with the work of Sir, F. Harrods (1900-1978) and E. Domar (1914-1997) in what was termed the "Harrods-Domar Model" and that of Walt W. Rostow's theory. Generally, the linear stages theory supports the view that economic growth could be achieved through industrialization. The Harrods-Domar theory presupposed that growth depended on a country's savings rate, capital/output ratio, and capital depreciation. This theory has been criticized for three reasons.

Firstly, it centers on the assumption of erogeneity for all key parameters. Secondly, it ignores technical change, and lastly, it does not allow diminishing returns when one factor expands relative to another.

The second began with the neoclassical (Solow) model, which contained the thinking that growth reflected technical progress and key inputs, (labour and capital). This school of thought is concerned with the efficient and cost effective allocation of resources and with optimal growth of those resources over time. They hold that countries develop economically via the market and that private markets, not government intervention, are critical for development experienced in the 1980s. The model allowed for diminishing returns, perfect competition but not externalities. The basic problems associated with the neoclassical thinking are that it hardly explains the sources of technical change. (Romer 1994).

The third is the never alternative growth theory, which entrances a diverse body of theoretical and empirical work that emerged in the 1980s. This is the endogenous growth model. It distinguished itself from the neoclassical growth model by emphasizing that economic growth was an outcome of an economic system, not the result of forces that impinged from outside. Its central idea is that the proximate causes of economic growth were the effort to economize, the accumulation of knowledge, and the accumulation of capital. (Romers, 1994).

2.3 Related Empirical Review

Neoclassical investment theory asserts that investment led growth is feasible through increased factor accumulat9ion. The major argument of the model is that it addresses the primary motive for private investment, which is to make profit. Recent empirical studies by Green and Villanveva (1991), have extended the neoclassical model by incorporating other considerations which include factors such as macroeconomic instability (inflation), macroeconomic policies (monetary and fiscal), the incentive structure and response to it, risk and irreversibility. They concluded that risk plays a vital role in investment decision because it is irreversible. According to them, the decision to invest or postpone investment depends on the perception of the magnitude of risk by the investor. In most cases, risk arises from high rate of macroeconomic instability (inflation) and socio-political instability.

Chadra and Sandilands (2002), using various concepts of investment such as private investment, government investment, total investment and fixed capital formation, to investment the issue of causality. They came up with the basic conclusion that in India, capital accumulation is the result rather than the cause of growth, that is, economic growth determines capital accumulation. These findings suggest that policies aimed at

increasing savings and investment should be vigorously pursued. They also suggest that available resources should be allowed to flow to sectors with greatest social returns, lowest prices and cost.

Capital accumulation (investment) is regarded as the key to economic growth. In a recent study by Blomstorm et al (1996), they tested the causality between fixed investment and growth rate by using the Granger (1969) framework. They found that economic growth precedes capital formation and that there is no evidence of feedback. They concluded that the rate of capital formation determines the rate of a country's economic growth.

3.0 Methodological Issues

3.1 Estimation Technique and Procedure

The study applied econometric analysis based on Granger Causality technique using Nigeria time series, with data sourced from Central Bank of Nigeria publications, spanning from 1980 to 2014. Granger causality test is used to determine if it is economic growth or the selected private sector indicators are significant in either enhancing or deteriorating the rate of each other. It traces the direction of causality between economic growth and the selected private sector indicators in Nigeria. To determine the direction of causality, the standard Granger causality test (1969) was applied for this study. For instance, the test involves estimating a pair of regression using some variables as expressed below:

$$GDPt = \sum_{i=1}^{n} \sim' in GCFt - i + \sum_{j=1}^{n} j \ \text{lnGDPt} - \text{j} + \mu\text{tl} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$GCFt = \sum_{i=1}^{n} \Phi i \ \text{lnGDPt} - \text{i} + \sum_{j=1}^{n} \ddot{} j \ \text{lnGCFt} - \text{j} + \mu\text{t2} \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Equation 1 postulates that current GDP is related to each independent parameter for private sector investment (e.g. Gross Capital Formation) or their past values as well as its own past values (GDt – j) where $\acute{a}$ and β are their coefficients, i and j indicate length of time lags while μtl is the error term and n is the number of lag terms included. GDPt is the current value of economic growth (GDP).

In like manner, equation 2 postulates that currents (GCFt) is related to a number of its lags (GCFt – i) or past values of itself as well as past values of GDP and the same explanations in equation 1 applies to equation 2, , $\acute{a}$, Φ i and ¨ are the coefficients, and μ_1 and μ_2 are the disturbance terms, which are assumed uncorrelated, t indicates that the regression is a time series. The selected private sector-indicators and GDP are the testable variables. For equation 1, hypothesis that $\beta = \acute{a} = 0$ for all the 'i's, is tested against the alternative hypothesis that $\beta \neq 0$ and $\acute{a} \neq 0$. If the coefficient β is statistically significant but coefficient $\acute{a}$ is not, then GDP causes GCF. If the reverse is the case, then GCF causes GDP. However, where both coefficients are statistically significant, bilateral causality exists. The same steps are applied to equation 2 and the remaining explanatory variables. The F-statistics ratios and their probabilities are used to confirm direction of causation based on the level of significance of the unrestricted OLS regression.

This approach is preferred to traditional correlation method that measures only the linear relationship which does not necessarily imply causation or direction in any meaningful word, Zellner (1979), Grenger (1969). Usually three outcomes are possible-unidirectional when one null hypothesis is accepted and the other, rejected, bilateral or feedback when both null hypotheses are accepted and lastly independence when none of the pairs of null hypotheses is accepted.

Prior to the Granger Causality test, the level series OLS regression was applied at first stage to test for long run relationship between selected private investment indicators and economic growth, using GDP as the dependent variable while private investment indicators are the explanatory variables. Economic growth, represented as GDP was expressed as a function of the independent variables under a straight line equation for ordinary multiple regression.

3.2 Model Specification

In specifying the relationship between private sector investment indicators and economic growth in Nigeria, we applied the newer endogenous growth theory framework already discussed. It is assumed that increase in the availability of financial resources will lead to higher level of investment and ultimately economic growth while inflation is regarded as a constraint. Credit to private sector and savings are proxies for capital or financial resources. Foreign direct investment and Gross capital formation are proxies for private investment. These investment indicators are the explanatory variables while economic growth proxies by Gross Domestic Product (GDP) is the dependent variable.

Leaning on the endogenous growth theory, the functional and linear mathematical relationships of the model are specified as follows:

$GDPt = f(CRP, Sir, FDI, Inf., \mu t$…….. (4)

$\Delta GDPt = \beta o - \ln \beta 1 CRPt + \ln \beta 2 Srt + \beta 2 Srt + \beta 3 FDlnt + \beta 4 GCFt +$
$\beta 5 lnf.t + \mu t.$ ..... (5)

Where:

GDP = Economic growth
Sir = National savings as ratio of GDP
CRP = Credit to private sector
FDI = Foreign direct investment
GCF = Gross Capital Formation
Inf. = Annual Inflation rate
Ut = Error term

Economic growth (GDP) which is the dependent variable is thus specified as a function of private sector investment indicators which are the explanatory variables. Theoretical prior expectation: $\beta 1, \beta 2, \beta 3$, and $\beta 4 > 0$,: $\beta 5 < 0$.

Hence, the above estimable long-run linear equation 5 posits that a change in economic growth in Nigeria is a function of the selected explanatory or investment indicator variables where, 't' indicates time-dependence and 'μ' is an unobservable component that is assumed "white noise" while 'ln' represents logarithmic expression used to make the calculation less tedious.

4.1 Data Presentation and Analysis

This section presents the data, the empirical results and discussions on the relevant findings from the model specifications test9ed in this research. Table 4.1 below shows the summary of empirical result when OLS multiple regression is run at the level.

Table 4.1

Long-run OLS Regression (Variables measured at level) Data Presentation
lnGDP = f(Lnf., lnCFP, lnGCF, SR, GC),
dependent Variable: lnGDP
Method: Least Squares
Date: 06/06/2016 Time: 09:33
Sample (adjusted): 1981-2014
Included observations: 34 after adjusting endpoints

Variable	coefficient	Std. Error	t-Statistic	Prob.
lNF	-0.332548	0.080039	-4.154837	0.0001*
SAR	-0.038213	0.046321	-0.824960	0.4306
lnFDln	0.029686	0.008057	3.684720	0.0004*
lnCRPn	-0.346218	0.102670	-3.372159	0.0011*
lnGCF	0.024264	0.028542	0.85001	0.4012
lnGCE	-0.530898	0.187050	-2.838265	0.0056*
C	2.005662	0.488623	4.104722	0.0000
R-squared	0.722742	Mean dependent var		12.8163
Adjusted R-squared	0.685452	S.D dependent var		2.18031
S.E of regression	0.215864	Akaike info criterion		0.00153
Sum squared resid	0.878374	Schwarz criterion		0.37672
Log likelihood	8.882113	F-statistic		205.076
Durbin-Watson stat	1.087723	Prob(F-statistic)		0.00000

Source: E-View Econometric Computer Software Application, Version 6

Analysis OLS Level Series Result

The Ordinary Least Square level series result as presented on table 4.1 above, shows that the coefficient of determination (R-square (0.72)' indicates that 72 percent of the variations in economic growth (GDP) are determined by the combined effect of changes in the explanatory variables are not rightly signed in accordance with the prior expectations except, inflation with negative sign. Foreign direct investment and Gross capital formation are positively related with GDP but only FDI is significant. Credit to private sector, inflation and savings are negatively related with GDP. High inflation rate constitutes a risk and therefore a constraint to the benefits derivable from national investment income in Nigeria. savings/GDP ratio is not significant. This confirms that Nigeria is a low savings economy due to low income and abject poverty. In addition, foreign direct investment result indicates positive exposure of the domestic economy to the external sector while the credit to private sector negative relations implies inadequate disbursement of loanable funds by banking system to private sector. Nnenna, et al (2004). The sub-optimal performance of Gross capital formation could be traced to many factors including persistent inflationary pressures.

Table 4.2 Summary of Unit Root Test Result Data Presentation

Variables	**At level**		**First order difference**		**remark**
	ADF Test Stat	Order of Integration	ADF Test Stat	Order of Integration	
(INF)	-2.187927	-	-3.226143	/ (1)	**
ln(GDP)	-1.860782	-	-3.999801	/ (1)	***
In(CRP)	-2.254731	-	-4.170888	/ (1)	***
In(GCE)	-2.118511	-	-6.966956	/ (1)	***
ln(GCF)	-2.259895	-	-5.900253	/ (1)	***
Ln(FDIn)	-1.902123	-	-4.205172	/ (1)	***
(SAR)	-2.259895	-	-5.900253	/ (1)	***
Note:	Critical value: 1% = -3.6852 5% = -2.9705 10% = -2.6242		Critical value: 1% = -3.6959 5% = -2.9750 10% = -2.6265		

* = 10% level of significance ** = 5% level of significance
*** = 1% level of significance.
Source: E-VIEW Econometric Computer Software application, Version 6

Analysis of Unit Root Test Results
In view of the suspected time-dependent feature of the data used for this research as shown on table 4.1, the ADF unit root test was applied separately on all the variables (investment indicators and GDP) at ordinary and first order levels of differencing. The objective of this test is to establish whether the time series have a stationary trend. The summary of the unit root test results as presented on Table 4.2 below shows that the null hypothesis of non-stationarity is accepted, implying that the variables are not stationary at level but could only be rejected after the first order /(1) differencing, (i.e. they became stationary after first order differencing) for all the selected variables at one and 5 percent levels of significance. This is evidenced by ADF test result at the ordinary level, which shows that the computed negative ADF test statistics for each variable is less than the Mackinnon critical values (Mackinnon, (1991), in absolute term.

Table 4.3
Summary of Pairwise Granger Causality Test Result
Sample: 1982-2013
Date: 06/06/2016 Time: 12:19
LAGS = 2
Observation = 32 (After Adjusting Endpoints)

Null Hypothesis	F-Statistics	Probability
InGDP does not Granger cause InCRP	2.14139	0.14033
InCRP does not Granger cause InGDP	2.25811	0.34457
LnSr does not Granger cause InGDP	0.35812	0.71877
LnGCE does not Granger cause InSr	1.25723	0.31055
LLnGCE does not Granger cause InGDP	1.23451	0.30143
LinGDP does not Granger cause LnGCE	2.14136	0.14132
InGDP does not Granger cause InFDIR	8.05879	0.00223*
InFDIR does not Granger cause InGDP	4.83583	0.02457*
LnINF does not Granger cause InGDP	5.26011	0.01022*
	1.25144	0.30567
LnGCF does not Granger cause InGDP	5.48770	0.02533*
InGDP does not Granger casue InGCF	1.24812	0.32015

At 5 percent significant level

Source: E-View econometric computer software application Version 6

Pairwise Granger Causality Test Analysis

The above test was run on the model with optimal lag of 2. The essence of this test is to establish the direction of causal relationship between economic growth and selected determinants of private sector investment. It is preferred to traditional correlation which measures only relationship without direction. Establishing which variable causes or promotes the other, will enhance effective economic planning especially in determining the relative weights to be assigned to these macroeconomic variables when planning in order to achieve sustainable economic growth.

As presented in table 4.2 and capitalizing on the F-statistics ratios, there exists unilateral causal relationships between the economic growth (GDP) and the private sector determinants (INF. And GCF) with F-statistics and probability ratios of 5.26011 (0.01022) and 5.48770 (0.02533) respectively at 5 percent level of significance without feedback. Significant bilateral causality runs between GDP and FDI implying that the variables determine each other. Independence causality runs significantly between the investment indicators (Sr and CRP) and GDP. The general results imply that causal relationship between economic growth and the selected investment indicators is mix and therefore inconclusive.

However, it agrees with the findings of Kara and Pentecost (2000) which show that causality tests are mixed and inconclusive depending on the variables used.

Conclusion and Recommendation

This study examined the long run as well as the causal and direction of relationship between private sector investment and economic growth in Nigeria. The overall import of the findings and analysis imply that the level of private investment in Nigeria is low and so, adversely influences economic growth. The study therefore recommends that government should strive to achieve sustainable price stability, economic efficiency

driven by infrastructural development and enhanced technological capabilities to boost private sector production capacity and ultimately real GDP.

Finally, stability shapes the overall investment climate and determines the degree of confidence investors have in an economy. It aids planning but macroeconomic and social instability is quite undesirable and its result shows adverse effect on growth. Therefore there is need to restore the confidence of the existing and prospective investors by restoring stability within the economy in order to enhance economic growth.

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