DOMESTIC INVESTMENT, CAPITAL FORMATION AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study evaluates the link existing among domestic investment, capital formation and economic growth in Nigeria. To finance investment for economic growth and development, every economy needs to mobilize capital. The research uses trend analysis and advanced econometrics test to ascertain the significant long-run and causal relationship existing among domestic investment, capital formation and economic growth in Nigeria. The results show that there is (1) Long run significant relationship that exists among domestic investment, capital formation and (2) both domestic investment and gross fixed capital formation granger cause economic growth in Nigeria within the period under study. It is found that gross fixed

capital formation has not moved with the growth rate of domestic investment in Nigeria. The study recommends that there is need for government to create enabling environment for domestic investment to thrive through adoption of macroeconomic policies which will create investment opportunities in the economy and contribute to the growth of the economy.

Keywords: Domestic investment, capital formation, economic growth, co-integration test; granger causality test; Nigeria.

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INTRODUCTION

It has been a common knowledge from time past that- for adequate investment needed for economic growth and development, every economy needs to accumulate high level of capital for investors to borrow. This is because, borrowing from outside is not a proper strategy for growth and development since it does not only have adverse effect on the balance of payment as these loans will be serviced in the future with the use of their domestic resources, but it equally carries a foreign exchange risk such as devaluation of their currency which is one of the specific conditional ties for borrowing from International Monetary Fund (IMF). Hence, domestic investment through capital formation is not just paramount, but serves as a prerequisite for the geometric acceleration of growth and development of every economy as it provides domestic resources that can be used to fund the investment effort of the economy.

The essence of this economic growth is for the creation of economic and social overhead capitals (or costs), which leads to increase in national output and income through creation of employment opportunities and reduction of vicious circle of poverty both from the demand side and supply side. Economic growth is *sine qua non* and where the citizenries of *per se* country could match up with the 21st century trends relatively to economies of the world. The discovered problem (s) that is responsible for the emerging economies is resulting from low capital formation (or base) (Jhingan, 2006; Ainabor, *et. al*., 2014). The emerging countries of the World have no opportunity costs or the attitude of sacrificing present consumption or investment in order to augment future national output and income (Ainabor, *et. al*., 2014). Gross capital formation leads to technical progress which helps realize the economies of large scale of production (or economies of scale or operation) and increases specialization, in terms of providing machines, tools and equipments for growing labour force. Thus, the accumulated capital enables the acquisition of new factories alongside with machinery, equipment and all productive capital goods. In addition, to the construction of capital or mega projects and utilize the gross capital formation into educational sectors, health sectors, etc (Jhingan, 2006).

Capital formation is analogous to an increase in physical capital stock of a nation with investment in social and economic infrastructures. Gross fixed capital formation can be classified into gross private domestic investment and gross public domestic investment. The gross public

investment includes investment by government and/or public enterprises. Gross domestic investment is equivalent to gross fixed capital formation plus net changes in the level of inventories (Jhingan, 2006). Capital formation perhaps leads to production of tangible goods (i.e., plants, tools & machinery, etc) and intangible goods (i.e., qualitative & high standard of education, health, scientific tradition and research) in a country.

A lot of economies depend on investments to resolve several economic problems, crisis and challenges. Less developed countries in Africa such as Nigeria is introducing various economic policies that will attract as well as keep hold of private investors. This is due to the fact that investments in certain sectors of the economy can rapidly transform the numerous economic challenges we are facing as a nation. Therefore, the Nigerian government at any given opportunity works a lot to attract investments into various sectors of the economy. The motive for this is not farfetched. Investment both private and public comes with a lot of benefits such as job creation, increase in per capita income, reduction in the level of poverty, increase in standard of living, increase in GDP, etc..

Real investment in the economy as an acceptable way of increasing capital formation in the economy has been known to increase productivity and output generally. Investment of this type can be undertaken by the public or private sectors, with the government being involved mainly with autonomous investments which act as the main drivers of other investment in the economy. Autonomous investment had dwindled drastically while the expenditure being made by the public sector are not delivering value where rightly conceived. A simple analysis of the capital formation statistics from the Central Bank of Nigerian shows that the nominal investment in capital formation is going down and has fallen in real terms. Investment could be social or soft in outlook (housing, health and education), while others are infrastructural or hard (transport, power and water), and yet others are purely economic, which the private sector undertakes for private capital accumulation. While financial investment is an avenue to increase wealth, real investment should be more emphasized to increase productivity and growth in the economy.

The importance of investment has been realized by successive administration long time ago. Rather than to take concrete steps to implement policies formulated and establish a culture of

continuous domestic investments, the government is gradually transferring this functions by encouraging a hybrid way of investment with the use of Private Public Partnership (PPP) in the country.

The nature and stability of domestic private investment (DPI) have attracted enormous debate in the literature of applied economics, particularly in the advanced market economies. To emphasize the preponderance of studies on this subject, Uremadu (2006), Adegbite and Owualla (2007) argues that although foreign direct investment (FDI) is beneficial to host countries by speeding up the process of economic growth and development, its multiplier effect is greater. In other words, developing countries should depend greatly on domestic investment rather than foreign direct investment (FDI).

In the early 1960s and up to 1985, Nigerian government was involved in direct productive activities while encouraging private sector investment. During that period, government took control of the commanding height of the economy with the hope of hastening the growth process. The windfall from petroleum in the middle of 1970s brought in the needed financial resources. Government, therefore, went beyond the role of providing an enabling environment by establishing and owning companies in all sectors of the economy. In 1986, the Structural Adjustment Programme (SAP) was put in place, with the objective among others of facilitating the development of the private sector, whose role could determine the level of economic growth of the Nigerian economy. However, the expected investment boom after the structural adjustment programme was not feasible and not much was recorded in terms of domestic investment. The DPI share of the gross domestic product (GDP) is still below 10 percent and the ratio has since been declining (Akpokodije, 1998). Government's policy response in form of trade reforms and other macroeconomic reforms with the hope of promoting and encouraging domestic private investment still remains disappointing.

During Structural Adjustment Programme (SAP) of 1986, the government of Nigeria considered the need for improvement in capital formation and pursued an economic reform that shifted emphasis on private sector. The public sector reforms were expected to ensure that interest rates were reduced (or positive) in real terms and/or to encourage savings, thereby ensuring that

investible funds would be readily available to the real sectors. Besides, the reforms were expected to lead to efficiency and productivity of labour; efficient utilization of economic resources, increase aggregate supply, reduces unemployment and generate single digit inflation rate. For example, during 1980s till date, the percentage of gross fixed capital formation had dwindling or fluctuating in Nigeria, inspite of SAP programme. The fluctuations in capital formation from 1980 to 2013 resulted from macroeconomic imbalances (or problems) such as deteriorating foreign exchange rate, increase in general price level, high real interest rate, double digit inflation, and high rate of corruption in public sector. In addition, inadequacy in economic infrastructures such as epileptic power generation, deplorable road networks as well as poor health and educational facilities were equally responsible for the decline in capital formation (Bakare, 2011; Ainabor, *et. al.,* 2014).

In Nigeria for instance, capital formation is low resulting from the fact that capita income is low. As a result, the marginal or average propensity to save is low, while the marginal or average propensity to consume is so high, this leads to un attainment of economic development. For economic development to be achieved in Nigeria, then there should be increase of domestic saving from 4% to there about 12% in national income, expansion of market, investment in capital equipment, decrease in population rate, correcting of imbalance of payments, declining of foreign debts, control of inflationary pressure, etc. These stated points are possible only and only if there is a rapid rate of capital formation in the country, that is, if smaller proportion of the community's current income or output is partly devoted to consumption and/or the other part is saved and/or invested in capital or industrial equipment.

Recently, the percentage of domestic investment and public investment has reduced drastically, which resulting from macroeconomic variables disequilibria—such as, inflation rate; exchange rate fluctuations; balance of payment problems; High external debt ratio; increase in population, corruption, etc. it was worsened when most recently there was a significant drop of crude oil prices in OPEC. This has had inverse relationship with countries that depended on crude oil or agriculture (mono-economy)—such as Nigeria. In other words, in Nigeria growth rate has dropped from 7% to 4.2%. This has led to devaluation of currencies and/or other stringent fiscal and monetary policies—such as reduction in taxes and deliberate attempt to make a mismatching

of the unit of domestic currency and another currency (most especially American dollar as the commonest currency for exchange for goods and services) (Ainabor, *et.al*, 2014).

Statement of the Problem

A number of studies have illustrated that there exist a correlation between private investment and public investment. Everhart and Sumlinski (2011), Odedokun (1997), are amongst scholars who have investigated this statement with different results. In less developed countries, government plays a vital function in capital formation. Specifically, public investment makes up a significant part of total investment. Hence, the effect of public investment on private investment is indefinite. That is to say, public investment can work as a substitute (negative impact on private investment) to or a complement (positive impact on private investment) for private investment. The level of the impact depends on the sector in which the government carries out the investment projects. Public investment may promote private investment when it assists in increasing the productivity of private-owned firms.

In spite of various structural changes and reforms in Nigeria, the country remains entangled with a number of economic maladies, which so far has proven to be overwhelming. Among these difficulties are high unemployment and poverty levels. The planned withdrawal of the government from the investment scene, and leaving it to the private sector to play its function has not been too promising for the nation. Nigeria's macroeconomic indicators show the pitiable performance of private investment in Nigeria for the period 1986 to date (CBN, 2010). For example, private investment declined from 12.3% of GDP in 1991 to 8.3% of GDP in 1992, this may be partly due to the reduced public investment, which fell during the same period. Private investment then increased to 12.5% in 1993 and to 16% in 1994. Later, it fell continuously to 8.9% in 1996. Between 2001 and 2005, the ratio averaged 13%; it peaked at 16.2% in 2002 but fell again to 12% in 2005 (CBN, 2010). It was found from the CBN statistical bulletin that the growth rate of domestic investment in 1980 was 133.1% while gross fixed capital formation was 11.7%. In the same year, the gross domestic product growth rate was 18.2%. This implies that the growth rate of domestic investment was greater than GDP growth rate while GDP Growth rate was greater than gross fixed capital formation (GFCF). In 1990, the growth rate of domestic investment (51.6%) was still greater than GDP growth rate (23.7%) while GDP growth rate was

still less than gross fixed capital formation (38.8%). However, it was observed that between 1980 and 1990, GDP growth rate and gross fixed capital formation were on the increase while domestic investment growth rate was on the decrease.

Considering the Accelerator theory of investment which states that as income or capital formation increases in an economy, so does the investment made by firms as well as GDP growth rate, one observes that in the year 2000 and 2010, GDP growth rate decreased from 43.5% to 37.1%. Domestic investment growth rate also decreased from 67.9% to 5.2% while gross fixed capital formation growth rate increased from 9.% to 11.1%. This implies that while the growth rate of GDP and domestic investment were on the decrease, gross fixed capital formation growth rate was on the increase. It was also found that between 2013 and 2014, GDP growth rate decreased from 4.6% to 3.02%, domestic investment also decreased from 12.6% to 5.6% while growth rate of gross fixed capital formation was on the increase from 3.01% to 11.2%(CBN,2014). On the average, it was gathered from the trend that if growth rate of domestic investment falls while gross fixed capital formation growth rate increases, GDP growth rate falls which is against the Accelerator theory of investment. Therefore, this study is embarked on, to evaluate the relationship existing among the variables in Nigeria.

Research Questions

In the course to examine the study, the following questions were considered. They are stated below as follows:

• To what extent does long run significant relationship exist among domestic investment, capital formation and economic growth in Nigeria within 1980 and 2014?

• Is there significant causal relationship among domestic investment, capital formation and economic growth in Nigeria within the period under study?

Objectives of the Study

The general objective of this study is to evaluate the link existing among domestic investment, capital formation and economic growth while the specific objectives are to;

• Ascertain if there is long run significant relationship that exist among domestic investment, capital formation and economic growth in Nigeria within 1980 and 2014.

• Find out if there is significant causal relationship between domestic investment, capital formation and economic growth within the period under study.

Hypotheses of the Study

1. There is no long run significant relationship that exists among domestic investment, capital formation and economic growth in Nigeria within 1980 and 2014

2. There is no significant causal relationship between domestic investment, capital formation and economic growth in Nigeria within the period under study.

Significance of the Study

This research empirically appraises the domestic investment, capital formation and economic growth in Nigeria. It is significant to individuals, government and academia in the following ways;

• To the individual, the study will throw more light on domestic investment, capital formation and economic growth. Thus, individuals will be acquainted with the activities regarding the domestic investment and formation of capital and its implication to the economy.

• To the government, the study recommends policies that will assist the concerned agencies in formulating policies towards improving performance and efficacy of economic growth.

• To the academia, this study contributes to knowledge and literature to be referred to by researchers.

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Scope of the Study

This study is on the relationship among domestic investment, capital formation and economic growth in Nigeria. It determines the existence or otherwise, of any significant impact of domestic investment, capital formation on economic growth in Nigeria. However, the data range covers from 1980-2014. The analysis is only restricted by the variables specified in the model such as domestic investment (DIN), capital formation (CFO) captured by gross fixed capital formation and gross domestic product (GDP). The geographical boundary of the location is Nigeria

REVIEW OF RELATED LITERATURE

A number of theories seeking to explain the investment behaviour of business firms and governments exist in the literature. Some of them include (1) Marginal efficiency of capital hypothesis (2) The Accelerator theory of investments (3) Tobin Q theory of investment and (4) The Harrod-Domar Growth Model. These are briefly explained as thus:

Marginal Efficiency of Capital Hypothesis

Marginal efficiency of capital hypothesis is a Keynesian concept; that stipulates the rate of discount which equates present value of net expected revenue from an investment of capital to its cost. The concept plays a major role in the Keynesian theory of investment; the level of investment is determined by the marginal efficiency of capital relative to the rate of interest. If the marginal efficiency rate is higher than the rate of interest, investment will be stimulated; if not, investment will be discouraged. This concept is based on the ordinary mathematical technique of computing present value of a given series of returns discounted at a specified discount rate (Encyclopaedia of Banking & Finance)

Accelerator Theory of Investments

The Accelerator theory of investment suggests that as demand or income increases in an economy, so does the investment made by firms. Furthermore, accelerator theory suggests that when demand levels result in an excess in demand, firms have two choices of how to meet demand. It is either to raise prices to cause demand to drop or to increase investment to match demand. The theory proposes that most companies choose to increase production thus increase their profits. The theory further explains how this growth attracts more investors, which in accelerates growth.

Tobin Q-Theory of Investment

Another theoretical model of capital formation and growth is ―Q‖ theory. In the ―Q‖ theory of capital formation (which is also in the neoclassical framework) the ratio of the market value of the existing capital stock to its replacement cost (the ―Q‖ ratio) is the main force driving investment and growth. Tobin argued that delivery lags and increasing marginal cost of investment are the reasons why Q would differ from unity.

The proponents of this approach are McKinnon (1973) and Shaw (1973). The core of their argument rested on the claim that developing countries suffer from financial repression (which is generally equated with controls on interest rates in a downward direction) and that if these countries were liberated from their repressive conditions, this would induce savings, investment and growth. Not only will liberalization increase savings and loanable funds, it will result in a more efficient allocation of these funds, both contributing to a higher economic growth. In the neoliberal view, investment is positively related to the real rate of interest in contrast with the neoclassical theory. The reason for this is that a rise in interest rates increases the volume of financial savings through financial intermediaries and thereby raises investible funds, a phenomenon that McKinnon (1973) called the —*conduit effect*. Thus, while it may be true that demand for investment declines with the rise in the real rate of interest, *realized* investment actually increases because of the greater availability of funds. This conclusion applies only when the capital market is in disequilibrium with the demand for funds exceeding supply (Donwa and Odia 2009).

Harrod-Domar Growth Model

This model was named after Sir Roy Harrod of England and professor Evesey Domarfro the US. It is a conventional empirical that helps people to understand the economic growth rate derive from the productivity of capital and the savings level. This model states that aggregate savings are arranged from any fund with the purpose of investment. Harrod-Domar growth model shows that the growth rate of an economy is dependent on the savings level and capital output ratio of the economy. Economic growth of Harrod-Domar model is under three conditions as follows;

- Investment is equal to savings
- Using full of capital stock
- Full employment

Therefore, the rate of growth in GDP will be sustained if the capital and labor have the same rate of growth as income growth rate. This model equally defines a close economy, assuming no government, no depreciation and investment is equal to saving.

Empirical Literature

The soundness of any theory whether economic or otherwise, is tested by its behaviour when subjected to empirical analysis. A number of studies have been conducted so far to study the relationship existing among domestic investment ,capital formation and economic growth in many developing countries, but most of them are connected to Latin American, Sub-Saharan and East Asian countries. These include:

Bakare (2011) used OLS Multiple Regression analytical method in the economy of Nigeria to examine the relationship between capital formation and economic growth. The test proved that the growth rate of national income positively, related to savings and capital formation.

Orji and Mba (2011) in their study, looked at relationship between FPI, Capital Formation and Growth in Nigeria, using the two-stage least squares (2SLS) method of estimation. The study finds that the long run impact of capital formation and foreign private investment on economic growth is larger than their short-run impact.

Anorou. & Ahmad (2001) investigated the relationship between savings and economic growth in 7 African countries, Congo, Cote d'ivoire, Ghana, Kenya, Nigeria, South Africa and Zambia using vector error correction model. The result indicated that there is a long run relationship between economic growth and saving. Also they found that savings granger causes growth in Congo and there is bi-directional causality in South Africa and Cote d'ivoirea.

Mohan (2006) addressed the relationship between domestic savings and economic growth for various economies with different income levels. The study used time series data on almost 20 countries with different income levels to investigate the relationship between the domestic savings and economic growth for various economies. Empirical results suggest that the economic growth rate Granger causes growth rate of savings in 13 countries. On the other hand the opposite results prevailed in two countries, Indonesia and Singapore, savings granger caused economic growth. In five countries, a bi-directional causation was found. Overall result shows that causality is from economic growth to domestic Savings.

Adekunle and Aderemi (2012) examined the relationship between Domestic Investment, Capital Formation and Population Growth in Nigeria using Secondary data from the Central Bank of Nigerian, for capacity utilization, capital expenditure bank credit and capital formation while growth and investment rates from World Economic Information database were used. Their result shows that the rate of investment does not assist the rate of growth of per capital GDP in Nigeria. The paper tests on the curve estimation regression models confirm that growth is in existence but is found to be insignificant. The linear result indicates the importance of government expenditure, capacity utilization and bank credit in increasing the income of Nigerians. The results also show that there is negative relationship between growth rates of the population and capital formation. With the curve estimation method results, investment rate can engender growth in the economy though slowly, on a linear path.

Ugwuegbe and Uruakpa, (2013) investigated the impact of capital formation on economic growth in Nigeria. To analyze the impact of capital formation, stock market capitalization, inflation rate and interest rate on economic growth, the study employed Ordinary least square (OLS) technique. To test for the properties of time series, Phillip-Perron test was used to determine the stationarity of the variables and it was discovered that gross fixed capital formation and economic growth are integrated of order zero I(0), Johansen co integration test was employed to determine the order of integration while error correction model was employed to determine the speed of adjustment to equilibrium. The empirical findings suggested that capital formation has positive and significant impact on economic growth in Nigeria for the period under review.

Kanu & Ozurumba, (2014) examined the impact of capital formation on the economic growth of Nigeria using multiple regressions technique. It was ascertained that in the short run, gross fixed capital formation had no significant impact on economic growth; while in the long run; the VAR model estimate indicates that gross fixed capital formation, total exports and the lagged values of GDP had positive long run relationships with economic growth in Nigeria. It was equally ascertained that there exists an inverse relationship between imports (IMP), Total National Savings (TNSV) and economic growth; while GDP was seen to have a unidirectional causal

relationship with export (EXP), Gross fixed capital formation (GFCF), Import (IMP) and Total national saving (TNSV).

METHODOLOGY

Model Specification

Having considered so many theories, this study anchored on investment – growth theories such as accelerator, Harrod-Domar and Neo-classical theory, which referred investment rate as a determinant of economic growth. This study adopts the classical theory model of growth represented in the Cobb-Douglas model by introducing the domestic investment factor to investigate the effect of domestic investment on economic growth in Nigeria.

Classical theory identified the sources of growth to include capital, labour and technology and the proportion of each variable can be identified through the Cobb- Douglas production function as stated below:

$$Y = AK^{\alpha}L^{1-\beta}$$ ……………………………….. (1)

In the light of the above model, we specify our model as below;

$$RGDP = F (DIN, GFCF) \tag{2}$$

Where; RGDP = Real Gross Domestic Product, DIN = Domestic Investment and GFCF = Gross Fixed Capital Formation. The relationship will be structurally expressed as follows,

$$RGDP_t = b_0 + b_1 DIN_t + b_2 GFCF_t + U_t \tag{3}$$

Where b_0 = Constant term, b_1 = Regression coefficient of DIN, $b_{2} =$ Regression coefficient of GFCF and U_t = Error Term.

Estimation Procedure

In the preliminary test, the following tests shall be conducted. They include:

Unit root test, Co-integration test, Error Correction Mechanism and Granger Causality Test

Unit Root Test: It is used to test for the stationarity of the time series data. Augmented Dickey fuller will be used in the process. In considering the levels the data could be said to be integrated of, Augmented Dickey fuller (ADF) test statistics shall be compared with the critical values at

5% level of significance. A situation whereby the (ADF) test statistics is greater than the critical values with consideration on the absolute values, the data at the tested order will be said to be stationary. Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of the alternative hypotheses of stationarity. The tests are conducted with and without a deterministic trend (t) for each of the series. The general form of (ADF) test is estimated by the following regression.

$$\Delta y_t = \alpha_0 + \alpha_1\, y_{t-1} + \sum_{i=1}^{n} \alpha \Delta y_i + \varepsilon_t \qquad (4)$$

$$\Delta y_t = \alpha_0 + \alpha_1\, y_{t-1} + \sum_{n=1}^{n} \alpha_1 \Delta y_i + \delta_t + \varepsilon_t \qquad (5)$$

Where:

Y is a time series, t is a linear time trend, Δ is the first difference operator, such that $\Delta y_{t-1} = y_t - y_{t-1}$, $\alpha 0$ is a constant, n is the optimum number of lags in the dependent variable and ε_t is the random error term.

The null hypothesis is that $\alpha_1 = 0$. If the null hypothesis $\alpha_1 = 1$, then we conclude that the series under consideration $\Delta(y_t)$ has a unit root and is therefore non-stationary. If the ADF test fails to reject the test in levels but rejects the test in first differences, then the series contains one unit root and is of integrated order one I (1). If the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series contains two unit roots and is of integrated order two I(2).

Co–integration Test: It is used to test for the long run relationship between the variables. And a long run relationship is found on these variables in which we will study. Johansen Co-integration Approach will be undertaken by the researcher in the course of the analysis. Hence, the use of Johansen Co-integrating Normalized coefficients to ascertain the nature of the long run relationship between the estimated variables. Johansen's methodology takes its starting point in the vector auto regression (VAR) of order P given by

$$y_t = \mu + \Delta_1\, y_{t-1} + \text{-------------} \Delta p \; y_{t-p} + \varepsilon_t \qquad (6)$$

To determine the number of co-integration vectors, Johansen (1988, 1989) and Johansen and Juselius (1990) suggested two statistic test, the first one is the trace test (λ trace). It tests the null hypothesis that the number of distinct cointegrating vector is less than or equal to q against a general unrestricted alternatives q = r. the test calculated as follows:

λ trace (r) = $-T \Sigma$ In (1- λ_t)

Where T is the number of usable observations, and the $\lambda_{1,s}$ are the estimated eigenvalue from the matrix. The Second statistical test is the maximum eigenvalue test (λ max) that is calculated according to the following formula.

λ max (r, r + 1) = -T In (1 – λr + 1)

The test concerns a test of the null hypothesis that there is r of co-integrating vectors against the alternative that r + 1 co-integrating vector.

Vector Error Correction Mechanism (VECM): The purpose of the vector error correction model is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the co-efficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long-run equilibrium.

The ECM (p) form is written as:

$$\Delta y_t = \delta + \rho y_{t-1} + \sum_{P-1} \Phi_i^* \Delta y_{t-1} + \varepsilon_t \qquad (7)$$

Where Δ is the differencing operator, such that $\Delta y_{t-1} = y_t - y_{t-1}$.

Granger Causality Test: It is used to test for pair-wise relationship between variables.

RESULTS

This section is centered on the result for data analysis. Data analysis involves working to uncover patterns and trends in data sets while interpretation involves explaining those patterns and trends. Data analysis is considered an important step and it is the heart of the research in any research work. When data has been collected with the assistance of relevant tools and methods, the next logical step, is to analyze and interpret the data with a view to arriving at empirical solution to the problem. Hence, the results for the analysis are presented below.

Unit Root Test

The Augmented Dickey-Fuller (ADF) was employed to test for the existence of unit roots in the data using trend and intercept. The results are presented in table one below.

Table 1: Augmented Dickey Fuller Unit Root Test

Trend and Intercept @ Levels

Series	ADF	5%	10%	critical	Order	Remarks

	Test Statistic	critical values	values		
LRGDP	-1.433594	-3.552973	-3.209642	0	Not Stationary
LDI	-3.456777	-3.552973	-3.209642	0	Not Stationary
LGFCF	-3.287902	-3.552973	-3.209642	0	Not Stationary

Sources: Researcher's compilation from E-view (version 7.0)

Table 2: Augmented Dickey Fuller Unit Root Test

Trend and Intercept @ 1st Difference

Series	ADF Test Statistic	5% critical values	10% critical values	Order	Remarks
LRGDP	-6.228408	-3.548490	-3.207094	1	Stationary
LDI	-4.532332	-3.548490	-3.207094	1	Stationary
LGFCF	-4.092495	-3.548490	-3.207094	1	Stationary

Sources: Researcher's compilation from E-view (version 7.0)

Co-integration Test

This technique is employed to testing for the presence of co integration between the series of the same order of integration through forming a co integration equation. The basic idea behind co integration is that if, in the long-run, two or more series move closely together, it is possible to regard these series as defining a long-run equilibrium relationship, as the difference between them is stationary.

Table 3: Johansen co-integration test for the series; LRGDP, LDI and LGFCF

Unrestricted Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.900079	90.70905	29.79707	0.0000
At most 1	0.301874	12.39421	15.49471	0.1390

At most 2	0.005167	0.176132	3.841466	0.6747

Trace test indicates 1 co integrating eqn(s) at the 0.05 level

Under the Johansen Co-integration Test, there are four co-integrating equations. In Johansen's Method, the trace statistic determines whether co-integrated variables exist.

Vector Error Correction Mechanism (VECM)

The presence of long run equilibrium relationship among the variables as found from the Johansen co integration led to the application of VECM. With this approach, both the long run equilibrium and short run dynamic relationships associated with variables under study is established.

Table 4: VECM

Co integrating Eq:	CointEq1	
LRGDP(-1)	1.000000	
LDI(-1)	0.142599	
	(0.03130)	
	[4.55618]	
LGFCF(-1)	-0.439851	
	(0.04208)	
	[-10.4529]	
C	-8.629248	

Error Correction:	D(LRGDP)	D(LDI)	D(LGFCF)
CointEq1	-0.873936	-0.097144	0.133630
	(0.06512)	(0.36217)	(0.11294)

	[-13.4209]	[-0.26823]	[1.18316]

D(LRGDP(-1))	0.022063	-0.666254	-0.099187
	(0.06791)	(0.37773)	(0.11779)
	[0.32486]	[-1.76386]	[-0.84204]

D(LDI(-1))	0.105822	0.227696	0.105174
	(0.03113)	(0.17313)	(0.05399)
	[3.39946]	[1.31515]	[1.94798]

D(LGFCF(-1))	-0.082971	-0.176505	0.224360
	(0.09595)	(0.53364)	(0.16641)
	[-0.86476]	[-0.33076]	[1.34820]

C	0.090992	0.225584	0.111082
	(0.02716)	(0.15106)	(0.04711)
	[3.35016]	[1.49333]	[2.35801]

The choice of lag length of one (1) was informed by the better results of the VECM which met the two conditions necessary for use of error correction model.

Table 5: VECM SYSTEM EQUATION

	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.873936	0.065118	-13.42087	0.0000
ΔRGDP	0.022063	0.067914	0.324864	0.7476
ΔDI	0.105822	0.031129	3.399460	0.0020
ΔGFCF	-0.082971	0.095947	-0.864760	0.3943
C	0.090992	0.027160	3.350157	0.0023

R-Squared = 0.867618, F-Statistics = 47.52, Prob (F-Statistic) = 0.0000

The existence of co integration among the variables as indicated above presents an evidence of long-run economic relationship among the variables. This implies that, vector error correction model is suited for further analysis. It captures both the long run equilibrium and short run dynamic relationships associated with the above results.

Granger Causality Test

With this test, the pair-wise relationships between the estimated variables are ascertained. Thus the table is presented below:

Table 6: Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.
LDI does not Granger Cause LRGDP	35	9.60288	0.0040
LRGDP does not Granger Cause LDI		1.8E-08	0.9999
LGFCF does not Granger Cause LRGDP	35	11.7819	0.0017
LRGDP does not Granger Cause LGFCF		0.15800	0.6936

Source: Eviews 7

Test of Research Hypotheses

Decision Rule: If the chosen level of significance is greater than the P-value, the null hypothesis is rejected otherwise, will be accepted.

Hypothesis One

1. There is no long run significant relationship that exists among domestic investment, capital formation and economic growth in Nigeria within 1980 and 2014.

To enable us arrive at informed decision, our bench mark/critical value is 5% level of significance.

If in the co integration test, the probability value (p-value) of committing type 1 error is les than 5%, reject the null hypothesis.

The co-integration result indicates one co-integrating equation for which p-value (0.0000) is < than 5% (0.05). This implies that the null hypothesis of no long run significant relationship is rejected while concluding that there is long run significant relationship which exists among domestic investment, capital formation and economic growth in Nigeria.

Hypothesis Two

There is no significant causal relationship between domestic investment, capital formation and economic growth in Nigeria within the period under study.

In this hypothesis, granger causality result is used. The result from the granger causality shows that the F-statistic for LDI => LRGDP is 9.60288 and its P-value is [0.0040]. The F-statistic for LGFCF => LRGDP is 11.7819 and its P-value is [0.0017]. The statistical value for causality from LRGDP => LGFCF is 0.15800 while its P-value is [0.6936]. Since the p-value of LDI => LRGDP and LGFCF => LRGDP (0.0040, 0.0017 respectively) are < than 5% 5% level of significance, we reject the null hypothesis while concluding that domestic investment and gross fixed capital formation granger cause economic growth in Nigeria within the period under study.

DISCUSSIONS OF RESULTS

This chapter dealt with the discussion of the findings. Thus, discussions were made in the light of the data analysis, thereby linking the results of the analysis to the existing theory.

The test on unit root test (table 1-2) shows that LRGDP, LDI and LGFCF are not stationary at levels. However, all the variables are stationary at first difference in ADF tests. Considering the time series using Augmented-Dickey Fuller at Trend & Intercept, all their calculated statistics are greater than the critical values at 5% level of significance. The results show that the time series are integrated of the same order; I (1), with the application of ADF test respectively.

The summary of the Johansen Co-integration Test is shown in table five above. The model with lag 1 was chosen with the linear deterministic test assumption. In order to find out if there is long run equilibrium relationship that exists between the LRGDP and the explanatory variables; LDI and LGFCF using the Johansen Co-integration Test, there is one co-integrating equation. As can be seen from the trace statistics [90.709 > 29.797] while the other trace statistics are less than the 5% critical [12.394 < 3.842] and [0.176 < 3.841]. In other words, the null hypothesis of no co-integration among the variables is rejected since at least one equation at 5% critical value is statistically significant. The test result shows the existence of a long-run equilibrium relationship among the variables.

With the identification of co integrating equations among the variables employed for estimation, vector error correction model VECM estimation presents the only option for predicting the dynamic behaviour of LRGDP in response to, LDI and LGFCF.

The Error correction term met the required conditions. Negative sign and statistical significance of the error correction coefficients are necessary conditions for any disequilibrium to be corrected. In light of this, the coefficient of ECM(-1) is -0.8739. The negative sign of the coefficient satisfied one condition while the fact that its P-value [0.0000] is less than 5% [0.05] level of significance satisfied the second condition of statistical significance. The coefficient indicated that the speed of adjustment between the short run dynamics and the long run equilibrium is 87.4%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium by 87.4% annually.

The computed coefficient of multiple determination (R^2) value of 0.867618 indicated that 86.8% of the total variation in Real Gross Domestic Product (LRGDP) is accounted for, by the explanatory variables: domestic investment (LDI) and gross fixed capital formation (LGFCF) while 13.2% of the changes in LRGDP are attributable to the influence of other factors not included in the regression equation.

Implication of the Results

The result as indicated by the trace statistics of the Johansen co integrating equation shows that there exist a long run equilibrium relationship real gross domestic product (LRGDP) and the

explanatory variables: domestic investment (LDI) and gross fixed capital formation (LGFCF) within the period under review. It is also estimated from the normalized co integrating coefficient which was found from the upper chamber of VECM that 1% increase in domestic investment, on the average will lead to 0.14% increase in the LRGDP. Obviously, the causality as revealed by the granger test proved that both investment and capital formation cause economic growth as proxed by real gross domestic product (LRGDP).

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

Summary of Findings

This study examined domestic investment, capital formation and economic growth from 1980 - 2014. In the model specified, Real Gross Domestic Product is a function of domestic investment (LDI) and gross fixed capital formation (LGFCF). With the aid of statistical and econometric techniques employed, the study found as follows:

1. There is Long run significant relationship that exists among domestic investment, capital formation and economic growth in Nigeria within 1980 and 2014.
2. There is significant causal relationship between domestic investment, capital formation and economic growth in Nigeria within the period under study.

Recommendations

In the light of the findings, two recommendations are made,

1. There is every need for government to create enabling environment for domestic investment to rise through adoption of macroeconomic policies which will imbuse investment opportunities in the economy thereby contributing to the growth of the economy.
2. It was found that domestic investment and capital formation granger cause economic growth. There should be diversification of the economy. Policy formulators in Nigeria need to enact some investor friendly policies that will encourage, promote capital formation and enabling environment for gross fixed capital formation to thrive.

Conclusion

The general objective of this study is to evaluate the link existing among domestic investment, capital formation and economic growth while the specific objectives are to; ascertain if there is long run significant relationship that exists among domestic investment, capital formation and economic growth in Nigeria within 1980 and 2014 and to find out if there is significant causal relationship between domestic investment, capital formation and economic growth within the period under study.

The study employed ex-post facto research design using Nigeria's data obtained from Central Bank of Nigeria (CBN) (1986-2014). The empirical results were on Augmented Dickey Fuller test. In the second step, Johansen Co integration Test was conducted. The presence of long run equilibrium found led to the use of Vector Error Correction Mechanism (VECM). It was found that domestic investment and capital formation cause growth of the economic growth in Nigeria within the period under study.

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