THE DYNAMIC LINKAGES BETWEEN INVESTMENT AND SUSTAINABLE ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

The paper empirically analysed the econometric dynamics of foreign and domestic investments for sustainable growth in Nigeria. In carrying out the investigation, ex-post research method, focusing on secondary sourced data on foreign direct investment (FDI), foreign portfolio investment (FPI) and domestic investment (DIN) inflows and real gross domestic product (GDP) were used. Econometric analytical procedure that involved descriptive statistics, stationarity test, granger causality test, cointegration test, vector error correction model (VECM) as well as impulse response to shocks was employed to answer research questions and test stated hypotheses. The findings show that significant long run relationship exist between investment sources and economic growth in Nigeria; specifically, the effects of FDI and DIN are significantly positive, while that of FPI is negative. Also, FDI appears to exert significant shocks on Nigeria's economic growth, though the level of shock does not seem to crowd out DIN. On the other DIN shocks does not seem to have significant effects on foreign investment inflows. Based on the findings, the study concludes that increased domestic investment is needed to provide the enabling environment that minimizes the domestic investment risk profile of the Nigerian business environment. Collaborative (public and organized private sector) intervention efforts by way of policies, programmes and projects need to be made to develop critical infrastructure (roads, power and security) as this will ease the burden of doing business in Nigeria, thereby attracting private investors from both local and foreign sources.

JEL Classification: E22, E62, G11, O47

1. Introduction

INVESTMENTS have remained all time critical driver of sustainable economic growth of nations globally. Many empirical studies across the globe are in agreement that there is a strong positive relationship between investment and economic growth. According to UNCTAD (1999), countries that devote high proportion of their income to investment may sustain more rapid economic growth than countries that invest less. However, looking at the relevant theories, investment can be financed from both the domestic and foreign sources by public and private investors (Okpara, Ajuka, and Nwaoha, 2012). Al-Mamun and Sohag

(2015) insist that part of the glaring features of underdevelopment is the low rate of capital formation occasioned by low rate of savings as well as low human capital formation and underutilization. No wonder the past three decades there has been an increase in the drive for foreign resources to finance investment in the development of critical infrastructure and productive capacity by developing economies, due largely to the perceived inadequate capacity of domestic economies to mobilize appropriate and adequate investment to meet the ever increasing need for critical social infrastructure (roads, water supply, health and educational facilities) as well as productive infrastructure such as power generating and transmission, irrigation, refineries, steel rolling mills, airport, railways, pipelines in such economies (Ebiringa and Eme, 2013).

Attempts have been made to address these investment problems through international cooperation by way of bilateral, trilateral and multilateral agreements among governments by developing countries such as Nigeria. Though some positive impacts have been recorded in the infrastructure and productive capacity growth and developmental strides of such nations (Anyanwu, 2011) but the investment gap still remains huge. Developing countries experiencing falling trend of national income in the face of increasing consumption needs, find it difficult to contribute significantly to domestic investment growths, thereby depending heavily on foreign sources. This of course is not without the risk of some level of compromise on aspects of her sovereignty and territorial integrity.

However, the experience of some other emerging economies such as China, South Korea, Brazil, United Arab Emirate and India, however, have proven that domestic investment is an enabler as well as a critical driver of foreign private investment inflow. The experiences of these economies have shown that domestic investment in critical national infrastructure can make significant impact in giving an economy the much needed attractiveness as a first choice investment destination haven for foreign investors. It therefore follows that to achieve sustainable economic growth in a country; investments are needed from both domestic and foreign sources. However the public sector investment by way of capital budget expenditure on critical infrastructure (roads, water, electricity, legal systems, security) must as a matter of fact be made in other to provide the enabling environment that attracts private investment, whether domestic or foreign (Ebiringa and Charles-Anyaogu, 2012).

Many developing nations including Nigeria, have equally attempted to bridge their domestic investment needs through credit financing from such international financial institutions like the World Bank, the International Monetary Fund (IMF),

the Paris Club of creditors, the London as well as the International Finance Co-operation (IFC). The experiences of such countries have not been very pleasant as most of the countries, including Nigeria had difficulty meeting the loan repayment schedules, which crystalized into foreign debt crisis with destabilizing macroeconomic consequences (Osuji and Ebiringa, 2012).

The aim of this research is therefore to examine the relationship between investment and economic growth in Nigeria. Besides this introduction, section two gives a review of related literature, while section three explains the model specification. Section four presents the empirical results, and section five provides the conclusion and policy implications.

2. Review of Related Literature

2.1 Conceptual framework

Investment is a conscious act of an individual or any entity that involves deployment of money in securities or assets issued by any financial institution with a view to obtaining the target returns over a specified period of time (Adeniyi, 2010). The target returns on an investment include increase in the value of the securities or asset and/or regular income must be available from the securities or asset. Broadly, investment can be categorized into three broad types namely; domestic investment and foreign investment. Domestic investment comprises of both public investment by government and private investments of residents of a country. Foreign investment on the other hand, comprises of foreign direct investment (FDI) and foreign portfolio investment (FPI). Foreign direct investment is defined as a cross-border investment in which a resident in one economy (the direct investor) acquires a lasting interest in an enterprise in another (the direct investment enterprise). By convention, a direct investment is established when the direct investor has acquired 10 percent or more of the ordinary shares or voting power of an enterprise abroad. FDIs involve the creation of a new establishment or investment, joint ventures, or the acquisition of an existing enterprise abroad (Mwillima, 2003).

Foreign portfolio investment (FPI) is an aspect of international capital flows comprising of transfer of financial assets: such as cash, stock or bonds across international borders in want of profit. It occurs when investors purchase controlling interest in foreign companies or buy securities or notes. Just as trade flows result from individuals and countries by exploiting their own comparative advantage, so too, are capital flows the result of individuals and countries seeking to make themselves better off, moving accumulated assets to wherever they are

likely to be most productive (Easterly, 1993; Eberts, 1986; Cuadros, Orts and Alguacil, 2004). This type of investment has become an increasing significant part of the world economy over the past three decades and an important source of fund to support investment not only in developed but also developing countries. Sustainable economic growth can be seen in this context as a rate of growth which can be maintained without creating other significant economic problems, especially for future generations. There is clearly a trade-off between rapid economic growth today, and growth in the future. The Nigerian economy has not been stable especially with the oil boom era leading to instability in the growth rate.

2.2 Theories of investment for economic growth

The investment literature has competing theoretical perspectives with conceptually distinct variables in the investment function. The paper shall briefly examine some of these.

2.2.1 *Accelerator Theory*

Accelerator models focus on output growth as the key determinant of investment decisions and are usually seen as 'Keynesian' given their focus on quantity adjustments and extrapolations of current levels to develop future expectations. Matthews (1959) explains accelerator theory's emphasis on simple quantity factors by describing the connection between profits and output growth: in an uncertain world, the trajectory of output growth is assumed to signal growth of future profitability. In deciding their desired capital stock, firms will proxy future profit expectations by looking at current and past levels of output. In addition, investors will invest to augment capital stock according to expectations of future output. Assume that a firm's capital stock is not at its desired level in the preceding periods, an accelerator model will typically use the level of output as the primary determinant of change in investment. On the other hand, if the capital stock were at its desired level in the previous period, the investment specification would be defined by the growth of output rather than the level. Simple accelerator models include only one output growth term within their specifications and imply that the capital stock reaches its desired level in each period of time, ignoring long-term expectations.

Accelerator theory embodies a key insight from Keynes: that expectations are the crucial and dynamic link that brings past, present and future together in the determination of capital stock. Accelerator models are also criticized for neglecting the cost related variables in the investment equation. From a neoclassical

perspective, critics of accelerator theory propose that investment is driven by profit maximization behaviour of business; thus cost variables should have an impact on investment.

2.2.2 *Jorgenson's Model*

In Jorgenson's (1963) early neoclassical model, investment is described as a process of optimal capital stock adjustment. The optimal capital stock is derived through maximization of discounted profit flows over an infinite time horizon. Jorgenson assumes that capital-labour ratios adapt to relative factor price changes, where the relative factor price of capital is measured as the user or rental cost of capital. At the end of the optimization problem, the main determinants of investment emerge as the user cost of capital (essentially the relative cost of capital inputs) and output. In this neoclassical approach, policy prescriptions centre around allowing the market to operate freely and efficiently by promoting the flexibility of prices. In his early work, Jorgenson assumes that capital stock adjustment is instantaneous, adjustment costs are zero, and investment decisions are completely reversible. This means that investors do not have to look to the future in Jorgenson's world because they can respond quickly and effectively when the time comes; their expectations are essentially static. Following widespread criticism, ad hoc lags are introduced into later specifications of Jorgensonian models to capture expectations.

However, the introduction of these specifications converts the Jorgensonian model from a neoclassical investment model to a modified accelerator model. Regarding his treatment of uncertainty, Jorgenson's model was even less useful than accelerator models, which at least implicitly recognized there are consequences to uncertainty in demand conditions. For the purposes of analysing the role of liquidity and uncertainty in an explicit investment framework, neoclassical theory does not provide any insight. Moreover, empirical modelling of Jorgenson's theory was not fully successful in the sense that there was little agreement about the impact of the user cost of capital on investment, which is at the core of neoclassical theory.

2.2.3 *Q Models*

The Q theory of investment established by Brainard and Tobin (1968) uses information in financial markets to relate unobservable to observables. According to this theory, investment is positively related to the ratio of the financial value of the firm (for the demand price of a firm) to the replacement cost of its existing

capital. Expectations about future unobservable are captured by the financial market valuation of the firm. In early formal derivations of q theory as exemplified by Abel (1980), adjustment cost technology is coupled with optimizing behaviour giving a relation between investment and marginal q, the ratio of discounted future revenues from an additional unit of capital to its purchase price. Because marginal q is unobservable, empirical researchers made the transition to average q. The main assumptions of this transition are 1) competitive product and factor markets, 2) linear homogeneous production and adjustment cost technologies, 3) homogeneous capital in the production function, and 4) the separation of financial and real decisions from each other as well as from investment decisions (Hayashi 1982). If the market capitalization of a firm exceeds the current replacement cost for firm's capital stock, average q will be greater than one and net investment will take place. If we leave the issue of stringent assumptions underlying the use of average q aside, one advantage of q theory models seems to be that the q investment equation will not be affected by instability in the expectations parameter because expectations enter the equation directly through q and are forward-looking in nature. Financial market data are assumed to reflect correct expectations about future variables, i.e. fundamentals.

Evidently, this efficient markets assumption is essential to q theory. Asset prices fully reflect all available information, respond completely and instantaneously to news and therefore provide an indicator of rational agents' assessments of the fundamental values of firms. However many studies have questioned the reliability of financial asset prices in evaluating the underlying fundamentals. Even in the more mainstream literature, excess volatility, mean reversion, fads and speculative bubbles in financial markets are seen as likely occurrences that violate the premises of the efficient market hypothesis. Given these problems, it is not surprising that the q model's empirical performance has been generally unsatisfactory. The problems of q theory would only be aggravated in the context of developing countries with less-than-perfect factor, output and financial markets.

2.2.4 *Euler Equation Models*

The Euler equation models differ only in the manner in which they solve the problem of unobservable expectations. The Euler equation model of investment posits a relation between investment rates in successive periods, which are derived from dynamic optimization under certainty in the presence of costs of adjustment. In this framework, the optimal policy is characterized as a comparison of net

benefits of investing today versus investing tomorrow. With any Euler equation derived from firm's maximization problem, the intuition is the following: the marginal cost of investing today (given by the sum of adjustment costs and the price of investment goods) is equal to the discounted marginal cost of postponing investment until tomorrow. The latter is equal to the sum of the foregone marginal benefit of an extra unit of capital, plus the adjustment cost and the price of investment tomorrow.

The Euler equation indicates that, along the optimal capital accumulation path, the firm will be indifferent to an increase in capital today only if there is a decrease by an equivalent amount in the next period, thus leaving the capital stock unaffected from the next period onward. Hence the difference in an investment equation derived through the Euler methodology is that an infinite or an unknown number of successive future periods is reduced to just the next period. This reduction is possible thanks to the assumption of reversibility of investment.

While the Euler equation models might consider sunk costs due to adjustment costs, they do not take the irreversibility of real investment into account. The irreversibility of real investment is a crucial matter that should be considered to analyse the role of expectations and uncertainty in investment theory. In other words, the Euler equation models do not address the unobservable expectation problem at all. Only if one maintains that the sample period contains no changes in factors affecting the stochastic environment, will the solutions through Euler equations be strictly valid. Many scholars have criticized this over reliance of neoclassical investment theory on the assumptions of certainty and rational expectations. Businesses operate in a 'fundamentally uncertain' environment that is incompatible with rational expectations theory. Theorists using New Keynesian investment models of changing financing constraints under liberalization generally prefer to use Euler equations given their explicit if unrealistic theoretical dynamics.

2.3 Empirical review

The role assigned to investment in the process of economic growth has been extensively postulated in growth theory and has found general applications in policy formulation by planners and managers of economies. The debate on the relationship between investment and economic growth is ample and not new in the literature. In Nigeria, there seem to be a huge proliferation of studies on the effect of foreign investment (FI) especially foreign direct investment (FDI) on economic growth. Studies that have found positive relationship between FDI and economic growth include but not limited to Wafure and Nurudeen (2010), Okpara et al.

(2012), Ebiringa and Eme (2013). In their study, Ebiringa and Eme (2013) adopted the Granger causality test and found that a causality relationship ran from FDI to economic growth (GDP) and not from GDP to FDI. In conclusion, the findings of their study showed that there is a positive relationship between FDI and economic growth which is an indication that FDI stimulates economic growth in Nigeria.

Ekpo (1997) examined the relationship(s) between FDI and some macroeconomic variables for the period 1970-1994. The author's results showed that the political regime, real income per capita, rate of inflation, world interest rate, credit rating, and debt service explained the variance of FDI inflows. Soludo (1998) maintained that it is not profitability of investment today that attracts investors to invest, but how long will the profit remain fairly stable overtime. Whenever the socio-political and economic environment is highly volatile, an investor is better off exercising his option to wait. On the other hand, he might decide to invest on those projects whose cycles are very short and can be easily undone. He also asserted that while the maintenance of the macroeconomic stability, avoidance of over-valued exchange rates and export orientation are critical for the resurgence of investment they are necessary but not sufficient conditions.

Wafure and Nurudeen (2010) using vector error correction model examined the factors influencing FDI flows into the Nigerian economy. The study revealed that the market size was found to be significant in attracting FDI. Deregulation of the economy was positively related to FDI inflows and also significant. Political instability in the previous year appeared to have a significant positive effect on foreign direct investment. Furthermore, the results reveal that exchange rate is significant in explaining changes in FDI. However, the results illustrate that openness of the economy and inflation are statistically insignificant but positively related to foreign direct investment. Similarly, the results show that infrastructural development has an insignificant effect on foreign direct investment in Nigeria. Okpara et al. (2012) examined the determinants of FDI using the Error correction methodology. The results reveal that in the long-run, the available natural resources which have been noted to be artificially meagre in Nigeria exert negative and significant impact on foreign direct investment.

Changyuan (2007) examined the direct and indirect effects of FDI on economic growth in the 29 mainland provinces in China for the period 1987-2001, based on the neoclassical model. The findings indicate that FDI and private investment have no direct effect on economic growth, but state-owned investment has a direct effect on economic growth. The findings also clarify that FDI

significantly increases the total factor productivity (TFP) and both private and state-owned investment have no significant effect on TFP. In particular, FDI has a positive effect on economic growth not through its direct effects but through its indirect effects by affecting technological progress and DI. Agosin and Mayer (2000) assessed the extent to which foreign direct investment in developing countries crowds in or crowds out domestic investment. Their model is run for three developing regions (Africa, Asia and Latin America) with panel data for the period 1970–1996 and the two sub-periods 1976–1985 and 1986–1996. Their model differed from previous models with the inclusion of lagged variables in the model (lagged FDI, lagged domestic investment and lagged growth rates). The results indicate that in Asia – but less so in Africa – there has been strong crowding in of domestic investment by FDI; by contrast, strong crowding out has been the norm in Latin America. The conclusion they reached was that the effects of FDI on domestic investment are by no means always favourable and that simplistic policies toward FDI are unlikely to be optimal.

Akinlo (2004) also investigated the impact of foreign direct investment (FDI) on economic growth in Nigeria, for the period 1970–2001. The ECM results showed that both private capital and lagged foreign capital have small, and not a statistically significant effect, on the economic growth. The results seem to support the argument that extractive FDI might not be growth enhancing as much as manufacturing FDI. The capital flows into the Nigeria economy has not really been tremendous when compared with flows into some developing economies of South Africa and Brazil. For example, from 2001 to 2007, the average annual capital inflows into Nigeria in terms of FDI and FPI were US$33,006 million and US$60,172 million, respectively.

3. Model Specification

The first set of analysis involves the estimation of the relationship between investment and economic growth. We decomposed investment into foreign direct investment (FDI) Foreign portfolio investment (FPI) and Domestic Investment (DIN). In order to conduct a comprehensive analysis, we generated the long run estimates using vector error correction model (VECM) normalizing on GDP. Preliminary analysis such as the descriptive and correlation statistics, Granger-causality test and unit roots test were performed on the data. The data covers the period 1985 to 2016 and sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin for various years. Though domestic, foreign direct and portfolio investment are component of aggregate investment and may be seen as playing

complementary roles in the investment-growth nexus, recent evidence in extant literature is suggestive that the determinants, inter-temporal properties and effects of these investment components on growth appear to be different. This motivates this study to examine the effect of investment in relation to these three variants on economic growth in the short and long run. In estimating the short and long run effects, the Vector error correction model will be utilized. Furthermore, to test the crowding in–crowding out hypotheses characterizing the dynamic behaviour of the various components of aggregate investment, the vector error correction (VEC) econometric technique comprising methods of cointegration and error correction mechanism will be utilized. Both models are presented in the study. The vector error correction model for the study is specified as:

$$GDP = a + \beta_1 \Sigma\Delta DIN + \beta_2 \Sigma\Delta FDI + \beta_3 \Sigma\Delta FPI + \Sigma\Delta ECM_{(-1)} + u \quad 1$$

The VEC specification is presented as:

$$\Delta GDP_t = a_0 + \sum_{n=1}^{k} \eta_{11}\Delta GDP_{t-1} + \sum_{n=1}^{k} \eta_{12}\Delta FDI_{t-1} + \sum_{n=1}^{k} \eta_{13}\Delta FPI_{t-1} + \sum_{n=1}^{k} \eta_{14}\Delta DIN_{t-1} + \mu_{t1} - \quad 2$$

$$\Delta DIN_t = a_0 + \sum_{n=1}^{k} \eta_{31}\Delta GDP_{t-1} + \sum_{n=1}^{k} \eta_{32}\Delta FDI_{t-1} + \sum_{n=1}^{k} \eta_{33}\Delta FPI_{t-1} + \sum_{n=1}^{k} \eta_{34}\Delta DIN_{t-1} + \mu_{t4} - \quad 3$$

Where:

GDP is the gross domestic product used as proxy for economic growth

DIN= Domestic investment

FDI= Foreign direct investment

FPI= Foreign portfolio investment

Δ= the difference operator

u = the stochastic disturbance or error term.

4. Results

Table 1: Descriptive statistics

	FPI	*GDP*	*DINV*	*FDI*
Mean	66052.64	394957.1	7631891.	461905.2
Median	5285.400	297883.9	123959.2	86772.95
Maximum	560498.5	956378.3	92770023	5699233.
Minimum	0.000000	183598.0	10199.30	264.3000
Std. Dev.	118124.5	219893.9	22488666	1298135.
Jarque-Bera	115.2690	6.557701	115.2563	226.6404
Probability	0.000000	0.037672	0.000000	0.000000
Observations	32	32	32	32

Source: E-Views statistical package version 8.

Note: FDI=foreign direct investment, FPI= Foreign portfolio investment, DIN= Domestic Investment and GDP= Gross domestic Product.

The data in table 2 show that, over the period, FPI averaged at 66052.64bn with highest value at 560498.5bn. The standard deviation is high and indicates the presence of significant fluctuations from the mean. Over the period, GDP averaged at 394957.1bn with highest value at 956378.3bn and the lowest value at 183598.9. The standard deviation is also high and indicates the presence of significant fluctuations from the mean. It can be seen from table 2 that over the period, DIN averaged at 7631891bn with highest value at 92770023bn and the lowest value at 10199.30. The standard deviation is also high and indicates the presence of significant fluctuations from the mean. Finally FDI averaged at 461095bn with highest value at 5699233 and the lowest value at 264.3000. The standard deviation is also high and indicates the presence of significant fluctuations from the mean. The Jarque-Bera statistics and probability values indicate the normality status of the variables.

Table 2: Correlation result

	FPI	*GDP*	*DINV*	*FDI*
FPI	1			
GDP	0.7167	1		
DINV	0.328	0.7339	1	
FDI	0.2589	0.62543	0.8415	1

Source: E-Views statistical package version 8.

Table 2 shows that the correlation coefficients of the variables. However, of particular interest to the study is the correlation of the variables with economic growth, as proxied by GDP. As observed, a positive correlation exists between GDP and FPI (r=0.716). A positive correlation is observed between GDP and DINV (r=0.734). In addition, we find the existence of positive correlation between GDP and FDI (r=-0.618).

4.2 Diagnostic analysis

The diagnostic analysis is carried out by way of unit root test.

4.2.1 *Unit Root Test*

Generally, unit root test involves the test of stationarity for the variables used in the regression analysis. The importance of stationarity of time series used in regression borders on the effect that a non-stationary time series is not possible to generalize on other time periods apart from the present. This makes forecasting based on such time series to be of little practical value. Moreover, regression of a non-stationary time series on another non-stationary time series may produce spurious result. The augmented Dicky Fuller (ADF) test is employed in order to analyse the unit roots.

The results are presented in levels and first difference. This enables us determine in comparative terms, the unit root among the time series and also to obtain more robust results.

Table 3: Summary of results unit root test

	Unit root test at 1st difference		
Variable	*ADF-Test Statistic*	*95% Critcal ADF Value*	*Remark*
GDP	-7.4761	-2.9678	Stationary
FDI	-6.6231	-2.9718	‘‘
FPI	-8.9033	-2.9678	‘‘
DIN	-10.0971	-2.9718	‘‘

Source: E-Views statistical package version 8.

Table 3 presents the results of the ADF test in levels without taking into consideration the trend of the variables. The reason for this is that an explicit test of the trending pattern of the time series has not been carried out. In the result, the ADF test statistics for the variables is shown in the second column, while the 95% critical ADF value is shown in the third column. The result indicates that all of the variables at levels, have ADF values that are less than the 95% critical ADF value of 2.96. The implication of this is that the time series for these variables are non-stationary in their levels. Moving forward, we take the first differences of the respective variables and perform the unit root test on each of the resultant time series. The rationale behind this procedure is that the Box and Jenkins (1976) have argued that differencing non-stationary time series will make it attain stationarity. The result of the unit root test on these variables in first differencing shows that the ADF values in absolute terms is greater than the 95% critical ADF values. With these result, these variables are adjudged to be stationary. This implies that the variables are actually difference stationary, attaining stationarity after first differences of the variables. Thus we accept the hypothesis that the variables possess unit roots. Indeed the variables are integrated of order one, ie, I(1).

4.2.2 *Testing Direction of Effects*

The results for the granger causality test are reported as follows in table 4. As is generally the case, the F-test is conducted on the null hypotheses in order to determine the direction of causality between each pair of variables. The rejection of each of the null hypothesis is based on the significance of the F-value for the particular relationship. The F-value for the null hypotheses that foreign direct investment (FDI) does not granger-cause gross domestic product (GDP) is significant which suggest the null hypothesis is rejected. The above result shows a unidirectional movement. The F-value for the null hypotheses that foreign portfolio

investment (FPI) does not granger-cause gross domestic product (GDP) is also significant which suggest the null hypothesis is rejected. This also confirms a unidirectional movement. However, there is a situation where domestic investment (DIN) does not granger-cause GDP, as the F-value appears not significant. This calls for investigation to determine why our domestic investment is not significant as this affects the growth rate of the economy. The question is: How long would the Nigerian economy continue to be driven by foreign components?

Table 4: Granger causality test

Null Hypothesis:	*Obs*	*F-Statistic*	*Prob.*
FDI does not Granger Cause GDP	29	4.82766	0.0173
GDP does not Granger Cause FDI		0.12979	0.8789
FPI does not Granger Cause GDP	29	4.96566	0.0157
GDP does not Granger Cause FPI		1.11301	0.3449
DIN does not Granger Cause GDP	29	0.37668	0.6901
GDP does not Granger Cause DIN		2.38500	0.1136
FPI does not Granger Cause FDI	29	0.58088	0.5671
FDI does not Granger Cause FPI		0.08248	0.9211
DIN does not Granger Cause FDI	29	2.17264	0.1358
FDI does not Granger Cause DIN		2.37837	0.1142
DIN does not Granger Cause FPI	29	1.21289	0.3149
FPI does not Granger Cause DIN		2.42587	0.1098

Source: Researchers Compilation (2018)* *sig @ 5%,*

4.3 Cointegration test

The results of the cointegration test are as presented in tables 5a and 5b. The aim is to establish whether long-run relationship exists among the variables of interest using the trace statistics. Table 5(a) shows the results for the test to reject or accept the null hypothesis that the vectors are not cointegrated (none). Specifically, the trace statistics show the presence of at least two cointegrating vectors in the long run results. We therefore proceed to estimate the long run relationship using the VECM and the multivariate dynamics in the system using VAR's impulse response and variance decomposition functions.

Table 5(b) shows the results for the test to reject or accept the null hypothesis that the vectors are not cointegrated (none). The maximum eigenvalue statistics equally confirms the presence of at least two cointegrating vectors in the long run results. We therefore proceed to estimate the long run relationship using the VECM

and the multivariate dynamics in the system using impulse response and variance decomposition functions.

Table 5(a): Johansen cointegration test results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	*Eigenvalue*	*Trace Statistics*	*Critical Value*	*Prob.***
None *	0.776777	82.86702	47.85613	0.0000
At most 1 *	0.561768	39.37908	29.79707	0.0029
At most 2	0.265962	15.45391	15.49471	0.0507
At most 3	0.200444	6.487265	3.841466	0.0109

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
Source: E-Views statistical package version 8.

Table 5(b): Johansen cointegration test results (maximum eigenvalue)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	*Eigenvalue*	*Trace Statistics*	*Critical Value*	*Prob.***
None *	0.776777	43.48794	27.58434	0.0002
At most 1 *	0.561768	23.92517	21.13162	0.0197
At most 2	0.265962	8.966641	14.26460	0.2889
At most 3	0.200444	3.841466	3.841466	0.0109

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
Source: E-Views statistical package version 8.

4.4 VECM AND VAR regression analysis

The vector error correction model (VECM) results are shown on table 6. The cointegration test indicates the existence of a long-run relationship between the variables and hence normalizing on gross domestic product, we generate the estimates the long run relationship between investment and economic growth. The result shows that a foreign direct investment (FDI) has a long run positive effect on economic growth as depicted by the slope coefficient of 1.3841 and t-value (4.397). Foreign portfolio investment (FPI) has a long run negative effect on economic growth as depicted by the slope coefficient (-1.80657) and t-value (-2.989). Domestic investment (DIN) has a long run positive impact on economic growth as depicted by the slope coefficient (0.5614) and t-value (5.618). Using sample period, the unrestricted VAR result shows that the economic growth is significantly affected by previous levels of economic growth (lag 1) and responds with a lag to Foreign private investment (lag 2) this implies that economic growth tends to be reinforcing in Nigeria. FDI and DIN respond significantly with a lag to foreign private investment (lags 1 and 2) while DIN responds significantly with a lag to foreign private investment (lags 1 and 2). The impulse response functions and variance decompositions will be used to provide stronger insight into the multivariate dynamics between the variables.

Table 6: VECM regression analysis results

VECM long run estimates normalized on GDP

FDI	1.3841	{0.3147}	[4.397]
FPI	-1.80657	{0.6042}	[-2.989]
DIN	0.5614	{0.0993}	[5.6181]

	GDP	*FDI*	*FPI*	*DINV*
GDP(-1)	1.424439	-1.8905	-0.94573	-50.3559
	(0.22994)	(4.05364)	(1.17608)	(48.7158)
	[6.19478]	[-0.46637]	[-0.80414]	[-1.03367]
GDP(-2)	-0.44315	5.094405	1.209247	77.18303
	(0.24595)	(4.33593)	(1.25798)	(52.1082)
	[-1.80174]	[1.17493]	[0.96126]	[1.48121]
FDI(-1)	0.028970	-1.17269	-0.08757	-9.19922
	(0.06480)	(1.14237)	(0.33144)	(13.7288)
	[0.44707]	[-1.02654]	[-0.26421]	[-0.67007]
FDI(-2)	0.027459	-1.49754	0.859679	-20.8123
	(0.11028)	(1.94405)	(0.56402)	(23.3632)
	[0.24900]	[-0.77032]	[1.52419]	[-0.89082]
FPI(-1)	-0.01144	-3.93667	-0.0333	-45.1121
	(0.04201)	(0.74068)	(0.21489)	(8.90133)
	[-0.27225]	[-5.31494]	[-0.15495]	[-5.06802]
FPI(-2)	0.138352	7.363636	0.153351	92.64208
	(0.06438)	(1.13499)	(0.32929)	(13.6400)
	[2.14892]	[6.48786]	[0.46570]	[6.79193]
DINV(-1)	-0.00101	0.082272	0.011111	1.859635
	(0.00517)	(0.09120)	(0.02646)	(1.09608)
	[-0.19528]	[0.90206]	[0.41988]	[1.69663]
DINV(-2)	-0.00423	0.098467	-0.08362	0.883336
	(0.01001)	(0.17654)	(0.05122)	(2.12167)
	[-0.42239]	[0.55775]	[-1.63257]	[0.41634]
C	10267.32	-674210	-63106.3	-5653782
	(29726.9)	(524054.)	(152043.)	(6297967)
	[0.34539]	[-1.28653]	[-0.41505]	[-0.89772]
R-squared	0.996290	0.968390	0.674447	0.984802
Adj. R-squared	0.994877	0.956348	0.550427	0.979012
F-statistic	704.9973	80.41782	5.438208	170.0947

Source: E-Views statistical package version 8.Standard errors in ( ) and t-statistics in [ ]

4.5 Impulse response functions

The impulse responses show the path when there are innovations in the policy variables. Figure 1 shows four panels of impulse response graphs indicating how innovations in foreign direct investment, foreign portfolio investment and domestic investment respectively affect economic growth over a period of 12 quarters.

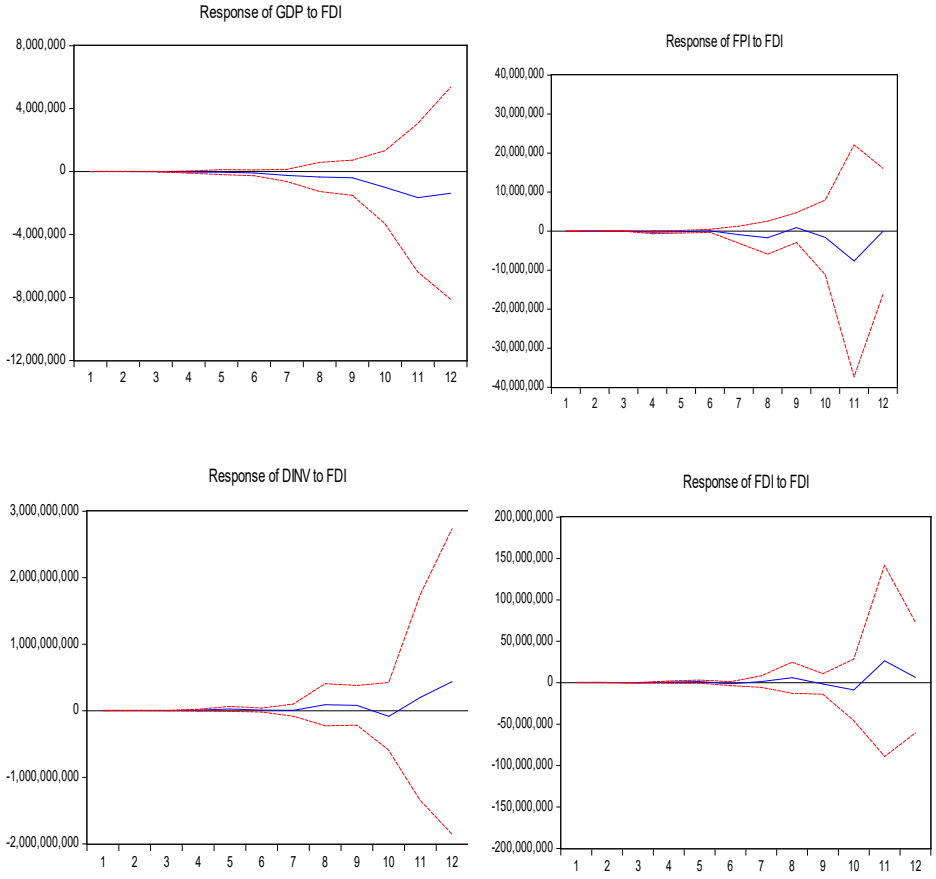

Figure 1: Responses of one standard deviation shocks to FDI shocks.
Source: E-Views statistical package version 8.

Figure 1 displays the responses of all variables in the VAR to innovations in foreign direct investment. As observed, economic growth appears to maintain its stability beginning from the first quarter and even up to the six quarter. Afterwards, it fluctuates negatively and slide towards disequilibrium and this suggest that FDI shocks will have a destabilizing impact on economic growth. We observe a delayed response of foreign portfolio investment (FPI) to shocks in FDI up until the six quarter and then fluctuate and eventually still moves towards equilibrium and hence FDI shocks may not have any significant destabilizing impact on FPI flows. We also consider the responses of domestic investment to FDI shocks. The response is quite steady until the 10^{th} period where it responds positively rising till the end of

the period horizon. This suggests that FDI shocks may not necessarily crowd out DIN but DIN is not unresponsive to FDI shocks. Finally, the persistence of FDI shocks which shows the pattern of development the variable within a protracted period caused by a shock to itself is fairly stable.

Figure 2 shows the responses of all variables in the VAR to innovations in foreign portfolio investment. As observed, economic growth appears to maintain it stability beginning over the study horizon and this suggest that FPI shocks will do not any significant destabilizing impact on economic growth. With respect to DIN, the fluctuations observed resulting from FPI shocks seem to be delayed and quite benign when it occurs at ninth quarter taking the path away from stability over the horizon, indicating that DINV do not react immediately to FPI shocks but with a significant lag. We observe a delayed response of FDI to shocks in FPI up until the six quarter and then fluctuate about the time path and eventually move towards disequilibrium. This indicates that though FDI responds with a significant lag to FPI shocks, it reacts by declining from the stable path. Finally, the persistence of FPI shocks which shows the pattern of development the variable within a protracted period caused by a shock to itself is fairly stable up until the ninth period where it oscillates about the stable path.

Figure 3 shows the responses of all variables in the VAR to innovations in domestic investment shocks. As observed, foreign direct investment (FDI) appears to maintain it stability over the horizon despite shocks from DIN and this implies that DIN shocks are unlikely to have any significant effects on FDI flows to Nigeria. It is also observed that the responses of FPI to domestic investment shocks are quite stable as the path seems not to fluctuate significantly below or above equilibrium over the period. This also suggests that DIN shocks are unlikely to have any significant effects on FPI flows to Nigeria. Moreover, the responses of FPI to domestic investment shocks are quite stable as the path seems not to fluctuate significantly below or above equilibrium over the period. The responses of GDP to domestic investment shocks are also quite stable though slides below the base origin after the 7^{th} quarter and this implies that DIN shocks can exert some significant effects on economic growth.

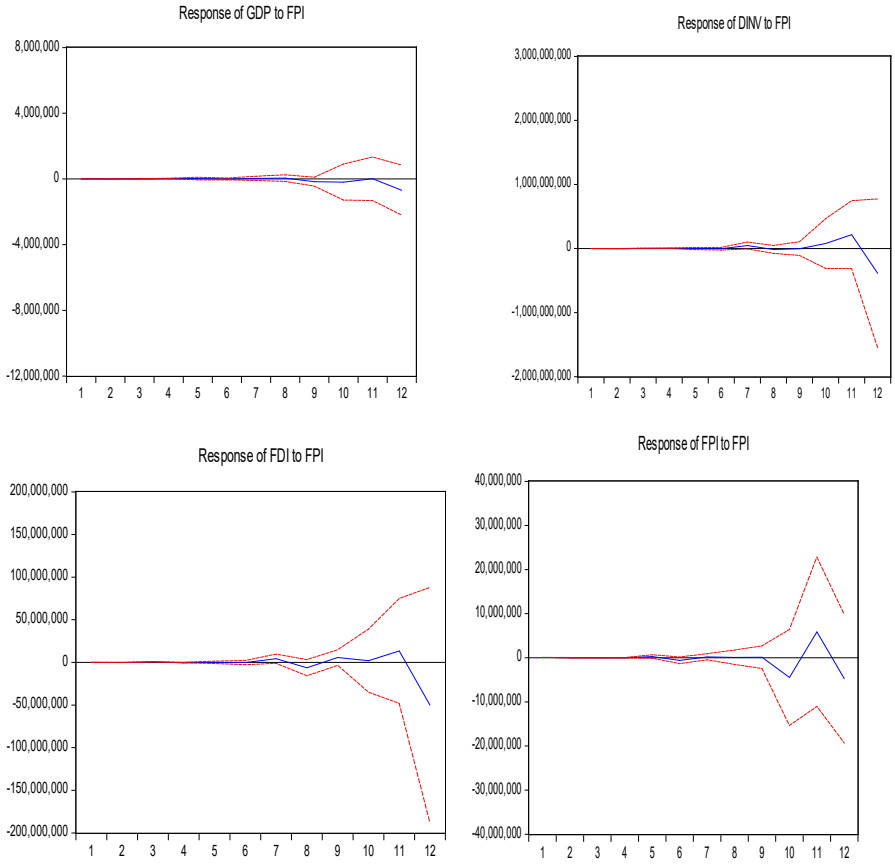

Figure 2: Responses of one standard deviation shocks to foreign portfolio investment
Source: E-Views statistical package version 8.

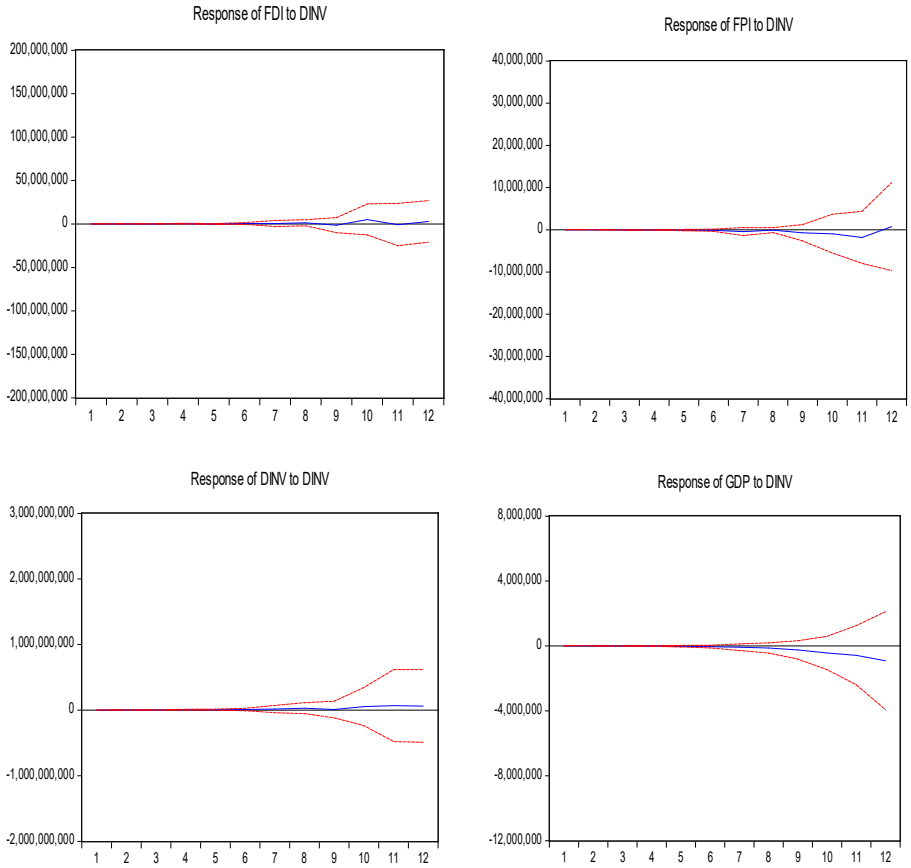

Figure 3: Responses of one standard deviation shocks to foreign portfolio investment
Source: E-Views statistical package version 8.

4.6 Variance decomposition analysis

Variance decomposition is estimated for 12 quarters. The main focus of this analysis is to investigate the relative importance of shocks from FDI, FPI and DIN in explaining the forecast error variance of the endogenous variable in the model. In evaluating the variance decomposition result (table 7), the study was particularly interested in the forecast error variance in GDP. The variance decomposition for GDP shows that in the first quarter 71.582 % of the forecast error variance in GDP is explained by the shock in itself declining to explain 65.766% in the third quarter and declining further to explain 20.327% of forecast error variance in the sixth quarter. It declines further in the ninth quarter explaining to 6.811% in the twelfth quarter. We observe that GDP is explaining a declining proportion of its own

forecast error variance over the horizon period. This confirms that economic growth shocks are highly dependent on other shocks in the economy. As shown in table 4.8, FDI shocks explains 16.486% in the first quarter and then rises to explain 27.73 % of the error variance in economic growth in the second quarter. In declines in the third quarter and the sixth quarter it explains 69.418. In the ninth and twelfth quarters, FDI shocks explain about 53.6206% and 54.5357% of the forecast errors of economic growth. FPI shocks explain about 0.260% of the forecast errors of economic growth in one quarter, it explains 15.32% to explain 14.88% in the fourth quarter, 4.950% in the tenth quarter and 7.751 in the final quarter. DIN shocks explain about 11.671 of the forecast errors in the first quarter, 16.564 in the third quarter, 27.889 in the tenth quarter and then 30.958% in the final quarter.

Table 7: Summary of variance decomposition statistics

Period	*S.E.*	*GDP*	*FDI*	*FPI*	*DIN*
1	15837.27	71.58248	16.48651	0.260041	11.67097
2	29958.52	60.59404	27.73493	0.524017	11.14702
3	38981.35	65.76592	17.06433	0.606132	16.56362
4	59268.74	45.44678	24.25284	14.88014	15.42024
5	77817.92	36.77343	26.88377	14.9416	21.4012
6	124914.8	20.32749	40.94255	6.102666	32.6273
7	293430.8	7.862427	69.418	1.862472	20.8571
8	472614.5	7.305571	68.72392	1.324431	22.64608
9	694670.4	6.81196	53.62064	7.664818	31.90259
10	1309730	5.392986	61.76695	4.950881	27.88918
11	2192271	5.833737	69.1425	1.786103	23.23766
12	2866641	6.753808	54.53572	7.751669	30.9588

Source: E-Views statistical package version 8.

4.7 Test of hypothesis

Ho1: Aggregate investment into Nigeria from domestic and foreign sources has not had significant effect on Nigeria's economic growth:

$$GDP = 1.3841FDI - 1.80657FPI + 0.5614DINV \quad (4)$$

t_{cal} *[4.397] [-2.989] [5.6181]*

The F_{cal} value of 704.9973 is greater the F_{tal} value, we therefore reject the hypothesis and conclude that aggregate investment into Nigeria from domestic and foreign sources has had significant effect on Nigeria's economic growth.

5. Conclusion and Recommendations

The results obtained in the empirical analysis are quite interesting and suggest certain policy direction issues. First, the result revealed that in the long run significant relationship exist between investment sources and trend of economic

growth in Nigeria. Specifically, the result shows that a foreign direct investment (FDI) has a long-run positive effect on economic growth; foreign portfolio investment (FPI) has a long-run negative effect on economic growth; while domestic investment (DIN) has a long-run positive impact on economic growth. Second, from the variance decomposition analysis, foreign direct investment seems to account for the strongest forecast error variance in economic growth and then followed by domestic investment. Foreign portfolio investment appears to have accounted for the lowest forecast error variance in economic growth over the horizon. Third, economic growth though initially stable and reacting with a significant lag to foreign direct investment (FDI) shocks, appears to have a destabilizing impact on economic growth. However, foreign portfolio investment (FPI) shocks do not have any significant destabilizing impact on economic growth. Fourth, though quite stable, FDI shocks may not necessarily crowd out domestic investment (DIN), but DIN is not unresponsive to FDI shocks. Also DIN shocks are unlikely to have any significant effects on FDI and FPI flows to Nigeria.

This study has among others found that sustainable economic growth can be attained in Nigeria through investment inflows from domestic and foreign sources. This finding is consistent with the earlier findings of Love (2003), Makki and Somwaru (2004), Masha et al. (2004) and Chimobi and Uche (2010). Again, the finding that shows that FDI and DIN has significant positive effect on Nigeria's GDP growth is in agreement with the findings of Akinlo (2004), which reported that though the domestic financial market is underdeveloped, it provides quicker access to funding for economic growth activities; as well as Carlson and Hernandez (2002), which identified the domestic bank as a critical source of investment for sustainable economic growth in a country.

Moreover, Blomstrom, Konan and Lipsey (2000), Anyanwu (2011), Carkovic and Levine (2002), Changyuan (2007) and Ebiringa and Eme (2013), who all suggested the complementary roles of FDI and domestic investment sources for result-oriented economic growth, agree with the outcome of this study. Furthermore, the finding that FPI has negative effect on Nigeria's economic growth is in agreement with that of Ebiringa and Duruibe (2015) that had earlier reported that the volatile state of the Nigerian economy has encouraged capital flight out of the Nigeria through the capital market by way of overseas remittances of huge capital gains made by speculative foreigner investors within short market cycles.

The result revealed that in the long run, foreign direct investment and domestic investment has a significant positive impact on economic growth. Consequently there is need for more foreign direct investment in Nigeria. Policies

that will attract FDI from developed economies should be put in place that makes Nigerian economy a favourable destination for investment flows. Also there is the need for the effective coordination of foreign direct investment flows. Over time, such flows appear to have been skewed to the oil sector at the expense of the non-oil sector.

Consequently, there is the need to stimulate domestic investment and capital formation. The direction of policy in this regards is to provide the adequate environment for domestic investments to thrive and, where necessary, provide some form of protection for domestic industries facing fierce competition from FDI flows. Also, there the need for financial regulation to ensure that credit is made available to domestic investors at affordable rates. Foreign direct investment seems to account for the strongest forecast error variance in economic growth and then followed by domestic investment. This shows that FDI is indeed crucial for Nigeria's economic growth. However, the dominance of FDI over domestic investments needs to be reduced. FDI's can indeed have ripple effects on the economy if the structure of investments is skewed largely to foreign ownership. There are issues of profit repatriation and risks of closure where their overriding interest is not protected by the system and other issues. Nigeria should not be an FDI dependent economy. There is the need to awaken domestic investments. Again FDI shocks appear to have a destabilizing impact on economic growth. However, foreign portfolio investment (FPI) shocks do not any significant destabilizing impact on economic growth. Hence this implies that there is the need for regulation of FDI flows such that the stability of the economy is ensured.

It is also recommended that there is the need for general macro-economic stability to be ensured. Economic uncertainties are a dis-incentive to foreign direct investment flows as investors prefer to operate within an environment of macro-economic stability to be able to form expectations and make sensible business forecast. Policy should be put in place on FDI to curb their restrictive business practice, limit their repatriation of profits from Nigeria and ensure that significant part of their profits are re-invested into the Nigerian economy.

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