A Re-examination of the Relationship between Foreign Capital Flows and Economic Growth in Nigeria

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Abstract

The study was carried out to re-examine the relationship between foreign capital flows and economic growth in Nigeria by collecting annual data over the period of 1986 to 2015 from various sources. The study employed a combination of stationary and nonstationary series. Similarly, irrespective of specifications, the study reported the absence of a long-run relationship between economic growth and its determinants in Nigeria. Furthermore, owing to absorptive capacity constraints (such as, infrastructural deficit, underdeveloped local financial market and negative and/or very weak positive spill-over effect on domestic investment), net FDI inflows exerted positive short-run influence on growth, while net portfolio flows and net foreign remittance had significant negative short-run effects on growth. Also, lower levels of net foreign aids and net external debt promote growth, while excessive levels of these flows dampen growth. All these imply that the relationship between foreign capital flows and economic growth in Nigeria is both linear and nonlinear. It is therefore recommended that policy makers in Nigeria encourage the inflow of capital that would be beneficial to the nation, in terms of stimulating domestic investment and economic growth. Putting measures in place to develop the nation's financial sector is also suggested to attract and make efficient use of capital flows in the country.

Keywords: Foreign capital, Economic growth, and Financial crisis

1. Introduction

Owing to the shortage of savings and foreign exchange to meet investment demands and other financial obligations, developing countries have resorted to seeking foreign capital to augment domestic savings. Foreign capital, which comes in form of foreign direct investment, foreign portfolio investment, official development assistance (or foreign aids and grants), foreign remittances, and foreign loans, have varying degrees of macroeconomic implications on the economies of the host countries. In the light of this, several empirical studies have been conducted to investigate the nexus between foreign capital flows and economic growth of either a country or a group of countries. These studies, nevertheless, have yielded mixed results (Ilhan,

2007). Despite the lack of congruency in the existing studies, there is a consensus in the literature that foreign direct investment and other forms of foreign capital flows would promote economic growth provided that host nations have the absorptive capacity, in terms of advanced technology, modern infrastructure, the necessary human capital, financial sector development, some degree of complementarity between capital flows, mostly, foreign direct investment, and domestic investment, and stable political and macroeconomic environments, to attract and make efficient use of such flows (Agbloyor et al, 2014; Durham, 2004; Akinlo, 2004).

Some empirical studies have shown that the impact of foreign capital flows differs across the various components of the flows (see, for example, Orji et al, 2014). The results obtained by the different authors might be attributed to the fact that portfolio flows are more volatile whereas FDI flows are relatively stable (Obiechina and Ukeje, 2013). In general, the volatility of capital flows is more pronounced during and after an economic recession than before the crisis. Also, capital flows volatility is a commonplace in developing countries which have weak and inefficient financial institutions to manage the flows in the face of financial crisis. Hence, larger capital flows during the pre-crisis period are associated with higher growth before the crisis and with lower growth at the inception of the crisis (World Bank, Global Development Finance, 2000).

At this juncture, the central contribution of the present study is to examine the growth effects of foreign capital flows based on the degree of complementarity and substitutability between foreign capital flows and domestic investment in the Nigerian context. Also, the study adopts and modifies relevant previous models by considering a baseline and alternative specifications. The specifications include linear and non-linear relationships, and those that capture the effects of interaction between foreign capital flows and some other variables (such as, oil price, domestic investment and financial depth indicator) in explaining the channels through which foreign capital flows impact or affect growth. Besides, the study investigates the possible role of the 2008-09 global financial crisis in the nexus between foreign capital flows and economic growth in Nigeria. The rest of the study is structured as follows: Section 2 entails a brief review of the literature. Sections 3 and 4 discuss the methodology and empirical results. Lastly, section 5 concludes the study.

2. Review of the Literature

The Two-gap model of foreign assistance (or foreign aids) was first developed by Chenery and Strout (1966) who identified the need to attract foreign capital, mostly foreign aids, to fill two gaps, namely savings gap and foreign exchange gap. The savings gap is the excess of domestic investment opportunities over domestic savings, causing investments to be limited by the available foreign exchange. The other gap, foreign exchange gap or constraint exists if a country supplies more foreign exchange to the rest of the world through imports than it receives foreign exchange from the rest of the world through exports. The Harrod-Domar growth model corroborates the Two-gap model of Chenery and Strout (1966) by emphasizing that countries experiencing a shortage in savings relative to investment should seek external capital in form of foreign aids or foreign private investment (that is, foreign direct investment and foreign portfolio investment) to fill the so-called investment-savings gap (Todaro and Smith, 2012). The Harrod-Domar growth model postulates that a positive relationship between savings and economic growth on the one hand, and a negative relationship between capital-output ratio and output growth.

With respect to closed economies, the Solow growth model predicts that countries with lower savings rate, other things being equal, grow more slowly in the short run than those with high savings rates and tend to converge to lower per capita income levels. However, with respect to open economies, the model predicts that countries experience income convergence at higher levels as capital flows from rich countries (where capital-labour ratios are higher and, thus, returns on investments are lower) to poor countries (where capital-labour ratios are lower and, thus, returns on investment are higher) (Todaro and Smith, 2012). Moreover, the most interesting aspect of endogenous growth models is that they help explain anomalous international flows of capital that exacerbate wealth disparities between developed and developing countries. The potentially high rates of return on investment offered by developing economies with low capital-labour ratios are eroded by lower levels of complementary investments in human capital (education), infrastructure, or research and development (R&D). Thus, in contrast to the neo-classical growth theories, models of endogenous growth suggest an active role for public policy in promoting economic development through direct and indirect investments in human capital formation and the encouragement of foreign private investments (most especially, FDI) in

knowledge-intensive industries, such as, computer software and telecommunications (Todaro and Smith, 2012).

To this end, the majority of the previous studies adopted similar methodologies and even sometimes arrived at similar conclusions. For instance, studies such as Akinlo (2004), Kolawole (2013), Jibir and Abdu (2017), Obiechina and Ukeje (2013), Ugwegbe et al (2016) estimated error correction model or vector error correction model as the case may be so as to quantify the impact of foreign capital flows on economic growth. All the studies in this group focused on Nigeria as a case study. They also captured only foreign direct investment (FDI) to proxy capital flows, except Ugwegbe et al (2016) who did not include FDI but captured two other forms of capital flows, namely external borrowing and official development assistance (ODA). All other authors adopted methodological frameworks other than error correction model (ECM), including ordinary least squares (OLS), three-stage least squares (3SLS), vector autoregression (VAR) and Toda-Yamamoto (T-Y) causality test (otherwise called modified Wald test, MWALD). Few studies captured more than one country, examples of which are Nyeadi et al (2014), Adeleke (2014) and Shen (2010), with the first treating each country under separate analysis and the last two treating the countries together in a panel. The group of countries captured by each of the three studies considered Nigeria as a candidate country to be studied. The two panel data studies by Adeleke (2014) and Shen (2010) estimated the three variants of panel regression specifications, such as, pooled OLS, fixed-effects and random-effects models in order to generate robustness for their separate analysis.

Moreover, most of the studies also paralleled one another in terms of their findings. For example, a set of studies found a positive and insignificant relationship between foreign direct investment (FDI) and economic growth, and they include Obiechina and Ukeje (2013), Ajide (2014), and Umoh et al (2012) and which obtained results similar to Akinlo's (2004) who suggested that the positive and insignificant relationship between FDI and growth could be attributed to the fact that FDI inflows target the extractive industry, dominated by the oil sub-sector in Nigeria, which has not only a low employment elasticity because of its capital-intensive nature, but also has a very poor forward and backward linkages with other sectors in the Nigerian economy; hence the insignificance of oil-targeted FDI on Nigeria's economic growth. Some studies drew the conclusion that at least unidirectional causality exists between FDI, foreign portfolio investment, foreign aids, or, remittances and economic growth, and they include

Obiechina and Ukeje, Okafor et al (2016), and Nyeadi et al (2014). However, few studies concluded that no causal link exists between foreign capital flows and economic growth, and they include Jibir and Abdu (2017), Nyeadi et al (2014), both of which paralleled the findings of Kolawole (2013). Another strands of studies found that foreign capital flows have no real effects in the current period, but are only effective in exerting influence on growth after some lags, and they include Jibir and Abdu (2017), Baghebo and Apere (2014), and Saibu and Keke (2014). In addition, a handful of studies noted a combination of positive and negative effects on the one hand, or, significant and insignificant effects of foreign capital flows on economic growth in the countries considered, Nigeria inclusive, and such studies include Osinubi (2010), Ugwegbe et al (2016), and Umoh et al (2012).

Having surveyed the available literature (see Table 1 below), the present study identified the following gaps which would be filled in due course. First, in testing for the probable existence of a long-run relationship between foreign capital flows and economic growth, having controlled for some other important variables, most studies focused mainly on Johansen cointegration test, which is only suitable when (i) all the variables are integrated of order one, that is, I(1) and (ii) when a system of equations is involved. To fill this gap, the present study would employ the Autoregressive Distributed Lag (ARDL) Bounds test. Besides, almost all the studies looked at the separate effects of domestic investment and foreign investment on growth, while ignoring the possible interaction between the two variables in affecting growth, most especially, when a researcher is interested in knowing not only the direct effects of foreign investment on an economy, but also its indirect effect, depending on the nature of relationship between domestic and foreign investment. The present study is up to fill this gap. In addition, none of the studies reviewed below captured the possible influence of oil price movement on the growth trajectory of Nigeria, but this study would fill the gap by accounting for growth effects of an exogenous factor-oil price-critical to the Nigerian economy. Lastly, out of all the studies reviewed, only the study by Shen (2010) investigated the possible role of banking crisis and currency crisis on the FDI-growth nexus among the group of countries surveyed. This present study would also add to knowledge by investigating the role of the 2008/2009 global financial crisis on not only FDI-growth nexus, but also on the nexus between other capital flows considered in this study (such as, foreign portfolio investment, foreign aids, remittances and external debt) and economic growth in the Nigerian context.

Table 1: Summary of Literature Review on Foreign Capital Flows-Growth Nexus

Author(s) and Year	Scope of coverage	Variables	Estimation method(s)	Findings
1. Adeleke (2014)	31 sub-Saharan African countries (1996-2010)	Real GDP, FDI, measures of governance, stock of human capital, gross capital formation, inflation, exchange rate, government expenditure, broad money supply, and a dummy variable to capture the effect of geographical location	Pooled OLS, fixed effects (FE) and random effects (RE) estimators	Direct and indirect effects of FDI through governance index are positive and significant.
2. Ajide (2014)	Nigeria (1980-2010)	Real GDP, capital, labour, FDI, ECF (Frazer Economic Freedom Index), life expectancy, domestic credit to private sector, and trade openness	Cointegration and error correction techniques	Positive and insignificant effect of FDI on growth.
3. Akinlo (2004)	Nigeria (1970-2001)	Labour, stock of private capital stock, stock of foreign investment, human capital indicators, real export, government budget balance, real government consumption, time trend, Broad money, % of GDP.	Error correction model (ECM)	Positive and significant effect of FDI on growth after some lags.
4. Baghebo and Apere (2014)	Nigeria (1986-2011)	Real GDP, net foreign portfolio investment, inflation rate, market capitalization, and trade openness	Cointegration and Error correction techniques	Significant effect of foreign portfolio investment after some lags
5. Jibir and Abdu (2017)	Nigeria (1970-2014)	Real GDP per capita, FDI inflow, gross fixed capital formation, inflation and trade openness	Vector error correction model (VECM)	FDI impacts growth positively after a lag. Causality was not established between FDI and growth

Source: Author's compilation

Author(s) and Year	Scope of coverage	Variables	Estimation method(s)	Findings
6. Kolawole (2013)	Nigeria (1980-2011)	Real GDP, domestic investment, FDI, export, import, and official development finance (ODA)	Johansen cointegration test, Granger-causality test and error correction model (ECM)	FDI impacts growth positively after some lags. No short-run causality between FDI and growth. Presence of long-run causal relation running from growth to FDI.
7. Nyeadi et al (2014)	Nigeria, Senegal, and Togo (1980-2012)	Remittance per capita and GDP	Granger causality and cointegration tests under the Vector Autoregression (VAR) framework	Unidirectional causality running from remittances to growth in Nigeria and Senegal. No causal relation between remittances and growth in the case of Togo.
8. Obiechina and Ukeje (2013)	Nigeria (1970-2010)	Nominal GDP (proxy for economic growth), nominal exchange rate, FDI, export, trade openness	Ordinary least squares (OLS)	Positive and insignificant effect of FDI on growth. Unidirectional causality running from nominal GDP to FDI.
9. Okafor et al (2016)	Nigeria (1981-2014)	GDP, FDI, foreign portfolio investment, and foreign aids	Toda-Yamamoto (T-Y) causality test	Joint causal relation running from foreign capital flows to GDP.
10. Osinubi and Amaghionyeodiwe (2010)	Nigeria (1970-2005)	Growth rate of nominal GDP, foreign private investment (proxy by FDI, foreign aids and other capital flows), domestic investment growth rate and growth rate of net exports	OLS	Positive and significant effect of foreign private investment on growth.
11. Saibu and Keke (2014)	Nigeria	GDP, net foreign private investment inflow, inflation (a proxy for macroeconomic instability), and breach of peace index (a proxy for political instability)	Cointegration and error correction techniques	Significant effect of foreign private investment on growth after some lags.

Source: Author's compilation

Author(s) and Year	Scope of coverage	Variables	Estimation method(s)	Findings
12. Shen (2010)	80 countries (1976 and 2007)	Foreign direct investment, foreign portfolio investment, domestic investment ratio, inflation, government consumption, initial value of real GDP (taking real GDP in 1976 as a proxy), human capital stock, dummy variables to capture the effects of liberalization, country wealth and region, twin crisis, and governance	Pooled OLS, fixed-effect, and random-effect estimators	FDI has a positive effect on growth, while foreign portfolio investment has a negative effect on growth.
13. Ugwegbe et al (2016)	Nigeria (1980-2013)	Gross domestic product, external debt, foreign aid, exchange rate, and foreign reserve	OLS	External debt has a positive and insignificant on growth, whereas, foreign aids have a positive and significant effect on growth. The reverse is the case in the long run.
14. Umoh et al (2012)	Nigeria (1970-2008)	Real GDP growth rate, labour, stocks of domestic and foreign capital, real government consumption, trade openness, human capital, financial depth, time trend (as a proxy for technological development), budget balance, and a dummy variable (to capture the real effect of structural adjustment programme, SAP)	OLS and three-stage least squares (3SLS)	FDI impacts growth positively

Source: Author's compilation

3. Methodology and Model Specification

The present study adopts the autoregressive distributed lag (ARDL) model as its empirical framework for the reason that the model offers some benefits: *First*, ARDL model allows for both the static and dynamic effect(s) of the independent variable(s) on the dependent variable unlike a static model that accounts for static or fixed effect(s) only. *Second*, ARDL framework offers a technique for checking the existence of a long-run relationship between variables, and that is referred to as the *Bounds test*. Bounds test is flexible as it accommodates both stationary and integrated series unlike other tests of cointegration, such as, Engle-Granger and Johansen tests, which considers only non-stationary series that are integrated of the same order. Three issues would be looked at here: ARDL model specification; deriving the long-run (or static) model from the ARDL model (which is a short-run model), and Bounds test for cointegration. An ARDL model is usually denoted in notational terms as ARDL (p, q_1.... q_K), where p is the number of lags of the dependent variable, q_1 is the number of lags of the first explanatory variable, q_K is the number of lags of the K^{th} explanatory variable, and K is the number of explanatory variables (X_1...X_K). For the purpose of this study, the simple case of ARDL (1, 1) would be used a working example. Algebraically, we have

General ARDL specification:

ARDL (p, q_1.... q_K):

$$y_t = \alpha + \sum_{i=1}^{p} \gamma_i y_{t-i} + \sum_{j=1}^{K} \sum_{i=0}^{q_j} X_{j,t-i}\,'\beta_{j,i} + \in_t \qquad (1)$$

Considering ARDL (1, 1), where p = 1, K = 1 and q_j = 0, 1 gives

ARDL (1, 1):

$$y_t = \alpha + \gamma y_{t-1} + \beta_0 X_t + \beta_1 X_{t-1} + \in_t \qquad (2)$$

3.1 Derivation of the Long-run Model from the ARDL Model

Since the ARDL model estimates the dynamic relationship between a dependent variables and explanatory variables, and, hence, is a short-run model, it is possible to transform the model into a long-run form as follows.

Given ARDL (1, 1) in eq. (2) as,

$$y_t = \alpha + \gamma y_{t-1} + \beta_0 X_t + \beta_1 X_{t-1} + \in_t$$

In the long run, $y_t = y_{t-1}$ and $X_t = X_{t-1}$, then the ARDL (1, 1) becomes

$$y_t = \alpha + \gamma y_t + \beta_0 X_t + \beta_1 X_t + \epsilon_t \quad (3)$$

Collecting like terms and expressing y as a function of X gives

$$y_t - \gamma y_t = \alpha + (\beta_0 + \beta_1) X_t + \epsilon_t$$

$$y_t(1 - \gamma) = \alpha + (\beta_0 + \beta_1) X_t + \epsilon_t$$

$$y_t = \frac{\alpha}{1-\gamma} + \frac{(\beta_0 + \beta_1)}{1-\gamma} X_t + \frac{\epsilon_t}{1-\gamma}$$

By letting

$$\emptyset_0 = \frac{\alpha}{1-\gamma}, \quad \emptyset_1 = \frac{(\beta_0+\beta_1)}{1-\gamma}, \quad \epsilon_t = \frac{\epsilon_t}{1-\gamma} \quad (4)$$

We have,

$$y_t = \emptyset_0 + \emptyset_1 X_t + \epsilon_t \quad (5)$$

where $\emptyset_0$ and $\emptyset_1$ are the long-run coefficients and α and β are the corresponding short-run coefficients, specifically, β_1 and $\emptyset_1$ are, respectively, the short-run and long-run effects of the explanatory variable X_t on the dependent variable y_t.

3.2 Bounds test for Cointegration

Traditional methods of estimating cointegrating relationships, such as, Engle-Granger and Johansen cointegration methods either require all variables to be I(1), or require prior knowledge of which variables are I(0) and which are I(1). To alleviate this problem, Pesaran, Shin and Smith (2001) showed that cointegrating systems can be estimated as ARDL models, with the advantage that variables in the cointegrating relationship can be either I(0) or I(1) without having to pre-specify which variables are I(0) or I(1). Also, unlike other methods of estimating cointegrating relationships, the ARDL representation does not require symmetry of lag lengths as each variable can have a different number of lag terms. The cointegrating regression form of an ARDL model, such as, eq. (2), is obtained by transforming the equation into difference form and substituting the long-run coefficients from eq. (5) as follows.

Using the information that

$\Delta y_t = y_t - y_{t-1}$ and $\Delta X_t = X_t - X_{t-1}$ (6)

$y_t = \Delta y_t + y_{t-1}$ and $X_t = \Delta X_t + X_{t-1}$ (7)

Substituting for y and X in eq. (2) gives

$\Delta y_t + y_{t-1} = \alpha + \gamma y_{t-1} + \beta_0(\Delta X_t + X_{t-1}) + \beta_1 X_{t-1} + \in_t$ (8)

Collecting like terms and expressing y as a function of X in difference form gives

$$\Delta y_t = \alpha + \gamma y_{t-1} - y_{t-1} + \beta_0 \Delta X_t + \beta_0 X_{t-1} + \beta_1 X_{t-1} + \in_t$$

$\Delta y_t = \alpha + (\gamma - 1) y_{t-1} + (\beta_0 + \beta_1) X_{t-1} + \beta_0 \Delta X_t + \in_t$ (9)

Using information about the long-run coefficients from eq. (4) as it can be re-written as:

$$y_t = -\frac{\alpha}{\gamma - 1} - \frac{(\beta_0 + \beta_1)}{\gamma - 1} X_t - \frac{\in_t}{\gamma - 1}$$

$y_t + \frac{\alpha}{\gamma - 1} + \frac{(\beta_0 + \beta_1)}{\gamma - 1} X_t = -\frac{\in_t}{\gamma - 1}$ (10)

Recall that from eq. (4), $\epsilon_t = \frac{\in_t}{1-\gamma} \equiv -\frac{\in_t}{\gamma - 1}$

So that $\in_t = -(\gamma - 1)\epsilon_t$ (11)

To conform to the expression in eq. (9), Eq. (10) can be re-written as

$$y_t + \frac{\alpha}{\gamma - 1} + \frac{(\beta_0 + \beta_1)}{\gamma - 1} X_t = -\frac{\in_t}{\gamma - 1}$$

By clearing the fraction, we have

$y_t(\gamma - 1) + \alpha + (\beta_0 + \beta_1) X_t = -\in_t$ (12)

Since from eq. (11), $\in_t = -(\gamma - 1)\epsilon_t$

We have $y_t(\gamma - 1) + \alpha + (\beta_0 + \beta_1) X_t = -[-(\gamma - 1)\epsilon_t]$

$y_t(\gamma - 1) + \alpha + (\beta_0 + \beta_1) X_t = -[(1 - \gamma)\epsilon_t]$ (13)

At time (t-1), eq. (13) becomes

$$y_{t-1}(\gamma - 1) + \alpha + (\beta_0 + \beta_1)X_{t-1} = -[(1 - \gamma)\epsilon_{t-1}] \quad (14)$$

Recall that eq. (9) is

$$\Delta y_t = \alpha + (\gamma - 1)y_{t-1} + (\beta_0 + \beta_1)X_{t-1} + \beta_0 \Delta X_t + \in_t$$

Now, substituting eq. (14) into eq. (9) yields

$$\Delta y_t = -[(1 - \gamma)\epsilon_{t-1}] + \beta_0 \Delta X_t + \in_t \quad (15)$$

Where ϵ_{t-1} is the error correction term (ECT) and the coefficient on the ECT $(1 - \gamma)$ is the speed of adjustment of the dependent variable from its short-run disequilibrium to its long-run equilibrium value following a shock to the explanatory at time (t-1) now corrected at time t. The coefficient is expected to be negative and statistically significant for y and X to be cointegrated.

By letting $(1 - \gamma)$ to equal ρ, eq. (15) becomes

$$\Delta y_t = -\rho\epsilon_{t-1} + \beta_0 \Delta X_t + \in_t \quad (16)$$

Following Pesaran et al (2001), the null and the alternative hypotheses are

H_0: ρ = 0 [which is equivalent to (γ-1) = 0 and ($\beta_0 + \beta_1$) = 0 from eq. (9)]: No cointegration

H_1: ρ ≠ 0 [which is equivalent to (γ-1) ≠ 0 and ($\beta_0 + \beta_1$) ≠ 0 from eq. (9)]: There is cointegration

Lastly, when there is cointegration between X and y, both the short-run model with error correction term (ECT) as in Eq. (16) and the long-run model as in Eq. (5) would be estimated. However, if X and y are not cointegrated, then only the short-run model without ECT as in Eq. (2) which is ARDL (1, 1) would be estimated.

To this end, the present study collected data on relevant variables covering the period of 1986 to 2016 (see Table 2 below) and then estimated the following relations within the framework of autoregressive distributed lag (ARDL) model discussed above. Specifically, this study employs both the baseline and alternative models in each of the relations.

(A) FDI-Growth Nexus

The present study adopts and modifies the model of Ramirez (2000) who, following the path of the endogenous growth literature and the works of de Mello (1997), developed a conceptual model that explicitly incorporates the positive and negative externalities or spill-overs associated with changes in the stock of foreign direct investment (FDI) in the case of Mexico. Similar specifications can be found in the works of Fedderke and Romm (2004) and Umoh et al (2011).

The Baseline Model

Model I *(No structural breaks and interactive terms):*

$$LRGDP_t = \alpha_0 + \alpha_1 GCF_t + \alpha_2 NFDI_t + \alpha_3 LOILP_t + \alpha_4 TOP_t + u_{1t} \quad (17)$$

Alternative Models

Model II *(Role of the recent Global Financial Crisis in FDI-Growth nexus):*

$$LRGDP_t = \alpha_5 + \alpha_6 GCF_t + \alpha_7 NFDI_t + \alpha_8 LOILP_t + \alpha_9 TOP_t + \alpha_{10} CRISIS + \alpha_{11} NFDI_t * CRISIS + u_{2t} \quad (18)$$

Model III *(Interactive effect of net FDI and domestic investment on growth):*

$$LRGDP_t = \alpha_{12} + \alpha_{13} GCF_t + \alpha_{14} NFDI_t + \alpha_{15} LOILP_t + \alpha_{16} TOP_t + \alpha_{17} NFDI_t * GCF_t + u_{3t} \quad (19)$$

Model IV *(Growth effect of oil price through the FDI channel):*

$$LRGDP_t = \alpha_{18} + \alpha_{19} GCF_t + \alpha_{20} NFDI_t + \alpha_{21} LOILP_t + \alpha_{22} TOP_t + \alpha_{23} LOILP_t * NFDI_t + u_{3t} \quad (20)$$

(B) Foreign Portfolio Investment-Growth Nexus/Foreign Remittances-Growth Nexus

This study adopts and modifies the model of Durham (2004) which looked at the direct and indirect effects of flows on growth through the financial sector and/or institutional development channels. Similarly, the study adopts and modifies the model of Guiliano and Ruiz-Arranz (2009) which examined the linkage between foreign remittances and growth via financial sector development and domestic investment channels.

The Baseline Model

Models V and VI *(No structural breaks and interactive terms):*

$$LRGDP_t = \beta_0 + \beta_1 GCF_t + \beta_2 FLOWS_t + \beta_3 DEPTH_t + \beta_4 TOP_t + \epsilon_{1t} \quad (21)$$

Alternative Models

Models VII and VIII *(Role of the recent Global Financial Crisis in net portfolio/net remittance flows-Growth nexus):*

$$LRGDP_t = \beta_5 + \beta_6 GCF_t + \beta_7 FLOWS_t + \beta_8 DEPTH_t + \beta_9 TOP_t + \beta_{10} CRISIS + \beta_{11}(FLOWS_t * CRISIS) + \epsilon_{2t} \quad (22)$$

Models IX and X *(Interactive effect of net portfolio investment/net remittances and domestic investment on growth)*

$$LRGDP_t = \beta_{12} + \beta_{13} GCF_t + \beta_{14} FLOWS_t + \beta_{15} DEPTH_t + \beta_{16} TOP_t + \beta_{17} FLOWS_t * GCF_t + \epsilon_{3t} \quad (23)$$

Models XI and XII *(Interactive effect of NPORT/REMIT and financial depth on growth):*

$$LRGDP_t = \beta_{12} + \beta_{13} GCF_t + \beta_{14} FLOWS_t + \beta_{15} DEPTH_t + \beta_{16} TOP_t + \beta_{17} FLOWS_t * DEPTH_t + u_{4t} \quad (24)$$

$$FLOWS_t = \{NPORT_t, REMIT_t\} \quad (25)$$

(C) Foreign Aids-Growth Nexus/External debt-Growth Nexus

This study adopts and modifies the model of Feeny and McGillivray (2009) which shows a non-linear or quadratic relationship between foreign aid and growth using panel data. Similar specifications can be found in earlier works of Burnside and Dollar (2000), Collier and Dollar (2002), Collier and Hoeffler (2004), Clemens et al (2004), and Easterly et al (2004). Similarly, the study adopts and modifies the model of Pattillo et al (2002, 2004) who considered both linear and nonlinear relationship between external debt and growth in respect of a panel of 93 countries over the period of 1969-98.

The Baseline Model

Models XIII and XIV *(No structural breaks, interactive terms, and quadratic terms):*

$$LRGDP_t = \psi_0 + \psi_1 GCF_t + \psi_2 FLOWS_t + \psi_3 TOP_t + \varepsilon_{1t} \quad (26)$$

Alternative Models

Models XV and XVI *(Role of the recent Global Financial Crisis in AIDS/external debt-Growth nexus):*

$$LRGDP_t = \psi_4 + \psi_5 GCF_t + \psi_6 FLOWS_t + \psi_7 TOP_t + \psi_8 CRISIS + \psi_9 FLOWS_t * CRISIS + \varepsilon_{2t} \quad (27)$$

Models XVII and XVIII *(Interactive effect of aids/external debt and domestic investment on growth):*

$$LRGDP_t = \psi_{10} + \psi_{11} GCF_t + \psi_{12} FLOWS_t + \psi_{13} TOP_t + \psi_{14} FLOWS_t * GCF_t + \varepsilon_{3t} \quad (28)$$

Models XIX and XX *(Non-linear effect of AIDS/external debt on growth):*

$$LRGDP_t = \psi_{15} + \psi_{16} GCF_t + \psi_{17} FLOWS_t + \psi_{18} FLOWS_t^2 + \psi_{19} TOP_t + \varepsilon_{4t} \quad (29)$$

$$FLOWS_t = \{AIDS_t, NEXTD\} \quad (30)$$

Table 2: Summary of Data Description and Data Sources

Variables	Description	Source of Data
$LRGDP$	Natural log of real GDP: a proxy for economic growth	World Development Indicator (WDI, 2015)
GCF	Gross capital formation (% of GDP): a proxy for domestic investment	World Development Indicator (WDI, 2015)
$NFDI$	Net foreign direct investment inflow (% of GDP)	World Development Indicator (WDI, 2015)
$NPORT$	Net foreign portfolio investment inflow (% of GDP)	Central Bank of Nigeria Statistical Bulletin (CBN, 2015)
$AIDS$	Net foreign aids received (% of GDP)	World Development Indicator (WDI, 2015)
$NEXTD$	Net external debt received (% of GDP)	World Development Indicator (WDI, 2015)
$REMIT$	Net foreign remittances received (% of GDP)	World Development Indicator (WDI, 2015)
$LOILP$	Natural log of West Texas Intermediate (WTI) spot price FOB ($/barrel)	US Energy Information Administration (EIA) website: www.eia.gov/dnav/pet/hist/Lefttandler.ashX?=PET&s=RWTC&f=m (last updated on 22nd March, 2017)
TOP	Trade openness (trade as % of GDP): a proxy for macroeconomic environment	World Development Indicator (WDI, 2015)
$DEPTH$	Financial depth indicator (measured by M2/GDP)	Central Bank of Nigeria Statistical Bulletin (CBN, 2015)
$CRISIS$	A dummy variable to capture the role of the 2008-09 global financial crisis in foreign capital flows-growth nexus in Nigeria. It takes the value of 0 for pre-crisis period (1986-2007) and the value of 1 for crisis and post-crisis period (2008-2015)	Author's formulation

Source: *Compiled by the Author*

Expected Results/A priori Expectations

(a) Traditionally, there is an expected positive relationship between domestic investment (measured using gross capital formation) and output (as measured by real GDP);

(b) There is an expected positive relationship between financial depth (as measured by M2/GDP) and output (as measured by real GDP): The more financially deepened (or liquid) an economy is, the more it is able to fund productive sectors that would contribute to output growth;

(c) The degree of openness of an economy is negatively related to its output growth. The more open an economy is, the more vulnerable it will be to external shocks since the economy depends largely on external trade for its survival, whereas, the less open an economy is, the more resilient it will be in the face of external shocks since such an economy has a strong output base to absorb such shocks;

(d) Oil price, standing alone or interacted with other variables, such as, FDI, has an ambiguous effect on growth depending on whether the Dutch disease syndrome exists. The syndrome exists where an increase in oil price causes an appreciation in the real exchange rate of the domestic currency leading to less competitiveness for a country's export products, which in turn reduces income through declining export demand;

(e) Foreign capital flows (FDI and non-FDI flows) have ambiguous effects on growth whether or not they are interacted with variables such as domestic investment and financial depth. A positive (or negative) growth effects of the interaction between foreign capital flows and domestic investment imply that foreign capital flows complement/crowd in (or substitute/crowd out) domestic investment. Also, a positive (or negative) growth effects of the interaction between foreign capital flows and financial depth imply that foreign capital flows complement (or substitute) the domestic financial sector, and

(f) Lastly, the non-linear growth theorists (such as Feeny and McGillivray, 2009 and Pattillo et al, 2002) postulate that economic growth exhibits diminishing returns to foreign aids and external debt such that the linear terms (such as, AID and NEXTD) have positive effects on growth, while the nonlinear or quadratic terms (such as, AID^2 and $NEXTD^2$) have negative effects on growth.

4. Empirical Results and Discussion

4.1 The Result of Unit Root Test

Table 3 below shows the result of ADF unit root test. It can be observed that the series that are stationary at levels (that is, series requiring no differencing) include net foreign aids, net foreign direct investment, net portfolio flows (% of GDP); trade openness, while, the series that are stationary only after first differencing include net external debt, net foreign remittances (% of GDP); financial depth indicator (M2/GDP), domestic investment (% of GDP); natural logs of oil price and real GDP.

Table 3: Result of ADF Unit Root Test

Variable	Level	First Difference	Remark
$AIDS$	-3.956**^{A}	…….. ‡	I(0)
$NEXTD$	-1.863^{B}	-7.579***^{B}	I(1)
$NFDI$	-3.728**^{A}	……..	I(0)
$NPORT$	-3.119**^{B}	……..	I(0)
$REMIT$	-2.005^{B}	-5.453***^{B}	I(1)
$DEPTH$	-2.656^{A}	-4.921***^{A}	I(1)
GCF	-1.549^{B}	-5.719***^{B}	I(1)
$LOILP$	-1.747^{A}	-4.615***^{A}	I(1)
$LRGDP$	-0.233^{A}	-7.627***^{A}	I(1)
TOP	-2.779*^{B}	……..	I(0)

***, **,* indicate the rejection of the null hypothesis of a unit root at 1%, 5% and 10%, respectively; ‡ implies that a series that is stationary at levels does not require its first difference being reported; A and B denote model with intercept and trend, and model with intercept only, respectively.

***Source**: Author's Computation*

4.2 The Result of ARDL Bounds Test for Cointegration

Since the result of ADF unit root test (ADF) showed that the series used in this study are either I(1) or I(0), the consideration of ARDL Bounds test for cointegration is plausible. Therefore, the result of Bounds cointegration test for each of the 20 models under five different categories of relationships is presented in Table 4 below. In each case of relationships, the result of cointegration test shows that the series in each of the 20 models are not cointegrated or do not have long-run relationships because their associated F-stats jointly fall below the I0 critical value bounds at 10% level of significance. It can therefore be concluded that there is no long run relationship between foreign capital flows (FDI, portfolio flows, aids, external debt and foreign remittances) and economic growth in Nigeria.

Table 4: Result of Bounds Cointegration Test

Relationship	**F-statistic**					
FDI-Growth	Model I	Model II		Model III	Model IV	
Nexus	1.8812	0.8122		1.4669	1.4304	
	Critical Value Bounds			**Critical value Bounds**		
	Significance	I0	I1	Significance	I0	I1
	10%	2.45	3.52	10%	2.26	3.35
	5%	2.86	4.01	5%	2.62	3.79
	2.5%	3.25	4.49	2.5%	2.96	4.18
	1%	3.74	5.06	1%	3.41	4.68
Portfolio flows-	Model V	Model VI		Model VII	Model VIII	
Growth Nexus	1.6559	1.3160		2.8489	1.4292	
	Critical Value Bounds			**Critical value Bounds**		
	Significance	I0	I1	Significance	I0	I1
	10%	2.45	3.52	10%	2.26	3.35
	5%	2.86	4.01	5%	2.62	3.79
	2.5%	3.25	4.49	2.5%	2.96	4.18
	1%	3.74	5.06	1%	3.41	4.68
Aids-Growth	Model IX	Model X		Model XI	Model XII	
Nexus	2.1291	1.0579		1.6531	1.4321	
	Critical Value Bounds			**Critical value Bounds**		
	Significance	I0	I1	Significance	I0	I1
	10%	2.72	3.77	10%	2.45	3.52
	5%	3.23	4.35	5%	2.86	4.01
	2.5%	3.69	4.89	2.5%	3.25	4.49
	1%	4.29	5.61	1%	3.74	5.06
External debt-	Model XIII	Model XIV		Model XV	Model XVI	
Growth Nexus	2.1536	0.6648		1.6477	2.0374	
	Critical Value Bounds			**Critical value Bounds**		
	Significance	I0	I1	Significance	I0	I1
	10%	2.72	3.77	10%	2.45	3.52
	5%	3.23	4.35	5%	2.86	4.01
	2.5%	3.69	4.89	2.5%	3.25	4.49
	1%	4.29	5.61	1%	3.74	5.06
Remittances-	Model XVII	Model XVIII		Model XIX	Model XX	
Growth Nexus	1.5851	1.6679		2.4688	1.3354	
	Critical Value Bounds			**Critical value Bounds**		
	Significance	I0	I1	Significance	I0	I1
	10%	2.45	3.52	10%	2.26	3.35
	5%	2.86	4.01	5%	2.62	3.79
	2.5%	3.25	4.49	2.5%	2.96	4.18
	1%	3.74	5.06	1%	3.41	4.68

***Source**: Author's Computation*

4.3 The Regression Results

The regression results on the 20 models estimated in the study are presented in Tables 5, 6, 7, 8, and 9 below. The five tables contain, respectively, estimated regressions on FDI-Growth Nexus, Portfolio flows-Growth Nexus, Foreign Remittances-Growth Nexus, Aids-Growth Nexus, and External debt-Growth Nexus.

Generally, considering the short-run relationship between foreign capital flows (of the five forms) and economic growth, the current value of real GDP was found to be positively and significantly determined by its previous value(s). This result implies that expectations about movement in real GDP are adaptive in the case of Nigeria. Accounting for the role of trade openness in the nexus between foreign capital flows and economic growth, there was found an expected negative growth effects emanating from high degree of openness of the Nigerian economy to the rest of the world mostly in terms of its massive oil exports and imports of manufactured products. The more open the Nigerian economy is, the more vulnerable it becomes to external shocks. Also, when evaluating the role of the 2008-09 global financial crisis in the nexus between foreign capital flows and economic growth, mixed results were generated. It was found that the crisis played a major role in reducing the output growth rates associated with each of net FDI inflows, net portfolio flows, net foreign aids and net foreign remittances following the crisis relative to the precrisis levels of output growth. This result could be attributed to the drastic fall in these flows into Nigeria from developed countries which were mostly affected by the crisis. However, the crisis played no significant role in the nexus between net external debt and economic growth in Nigeria.

Mixed results were reported across the different specifications about the growth effects of domestic investment. In the FDI-growth relations, domestic investment exerts positive but insignificant influence on growth when the role of the interaction between net FDI inflow and domestic investment was accounted for. The reason for this could be that the bulk of domestic investment is rooted in the oil and gas sector which, in turn, has a very low employment elasticity, and hence its lower contribution to the Nigerian economy. Also, considering the different portfolio flows-growth models, there is an overall negative effect of domestic investment on growth, and this could be attributed to insufficient funds usually allocated to the productive sectors of the economy by the nation's financial sector, which in turn undermines the role of domestic investment in output growth in Nigeria. Similarly, there is an overall negative

growth effect of domestic investment considering the various remittances-growth models. The negative effect of domestic investment could be attributed to the low share of investible funds generated in the economy as foreign remittances are usually transmitted through informal channels, households being the major beneficiaries which in turn spend more on consumptive goods, and less or nothing on investment goods.

Furthermore, across the foreign aids-growth models, it was found that domestic investment becomes a positive contributor to growth when net foreign aids was interacted with domestic investment. The negative contribution of domestic investment could be attributed to the lack of disincentive to save and invest usually created by the overreliance of the country on foreign aids to finance developmental projects. This latter finding is further confirmed by the negative growth effect of the interaction between net foreign aids and domestic investment. In the external debt-growth relations, domestic investment was found to exert an equivocally negative effect on growth, however, the former becomes a significant determinant of the latter after considering a non-linear specification. The negative effect of domestic investment might be attributed to disincentive to invest already created in investors due to excessive external borrowing by the country. The reason for this is that domestic investors believe that their investment returns would be offset by debt servicing and debt retirement in the future. This finding is further reinforced by the negative growth effect of the interaction between external debt and domestic investment.

There is an overall positive and significant short-run effect of net FDI inflows on growth, but the effect is rather weak. This finding might be attributed to the inability of domestic firms to adequately absorb the positive spill-over effects of FDI due to absorptive capacity constraints. A further support was found in the negative and insignificant growth effect of the interaction between net FDI inflow and domestic investment, and the conclusion that arises is that since profits are repatriated to countries of origin of the multinationals rather than it being reinvested to augment domestic investment to boost domestic output, FDI would remain market-seeking in the Nigerian economy. In the baseline model of FDI-growth nexus, net FDI inflow was found to impact growth positively but with lags, and this confirms the previous findings of Akinlo (2004). The positive and significant growth effect of FDI in Nigeria also lends empirical support to the findings of Orji et al (2014). Also, considering FDI-growth nexus, oil price was found to be a significant determinant of growth in Nigeria, increases in oil price are however contractionary.

This result confirms the presence of Dutch disease syndrome in the Nigerian economy as the major productive sectors of the economy have been neglected. Even, considering the indirect effect of oil price on growth through the FDI channel does not change the conclusion. This result is stark contrast with the findings of Alley et al (2014) that oil price promotes growth in Nigeria, but oil price shocks are contractionary.

Similarly, there is an overall negative and significant short-run effect of net portfolio flows on growth, whereas the negative effect turns positive when net portfolio flows was interacted with domestic investment, but the positive indirect effect was less than offset the negative direct effect already established. The contractionary effect of increased portfolio flows into the Nigerian economy could be attributed to the high volatility nature of such flows which makes them subject to frequent investment withdrawals. Also, interacting net portfolio flows with financial depth did not alter the overall negative effect of net portfolio flows on growth. This result implies that the financial sector is both underdeveloped and shallow and, is, therefore, not strong enough to avert the negative real effects of large influx of portfolio flows into the Nigerian economy. This result confirms the findings of Agbloyor et al (2014), but is in stark contrast with the works of Orji et al (2014). Moreover, there is an overall negative and significant short-run effect of net foreign remittances on growth. Even, the positive indirect effect of net foreign remittances on growth through domestic investment does not fully offset the already established negative direct effect. Generally, this result could be attributed to the fact that the financial sector in Nigeria remains largely underdeveloped, and that the transaction costs associated with accessing foreign remittances by banks are very high. This result is in in stark contrast with the finding of Orji et al (2014) that remittances is not a significant determinant of growth in Nigeria.

Considering net portfolio flows-growth nexus, the growth effect of financial depth (broad money-GDP ratio) was rather mixed. Financial depth exerts an overall positive and significant influence on growth after accounting for the role of the 2008-09 global financial crisis in the relation between net portfolio flows and economic growth. This result confirms the finding of Sanusi (2010) that, between 2004 and 2008, Nigeria enjoyed unprecedented increase in oil price which resulted in huge inflow of foreign exchange and robust economic growth, thereby boosting liquidity in the financial sector (banks and stock markets alike) in the country. Conversely, the negative growth effect of financial depth could be attributed to the

underdeveloped nature of the Nigeria's financial sector. Similarly, in the nexus between foreign remittances and growth, financial depth exerts an overall significant positive influence on growth.

Irrespective of specifications (linear and nonlinear), the role of net foreign aids received in real GDP growth remained insignificant. Nonetheless, owing to absorptive capacity constraints, lower levels of net foreign aids were found to contribute positively to growth, while higher/excessive levels of net foreign aids dampens growth. This, therefore, confirms the inverted U-shaped relationship between foreign aids and economic growth in Nigeria over the short term. This result is in conformity with the findings of Kolawole (2013) that foreign aids or official development assistance (ODA) had no real effect in Nigeria. It also confirms the findings of Feeny and McGillivray (2009) of the existence of a nonlinear relationship between aids and growth. Similarly, not until a non-linear external debt-growth relation was considered that net external debt received becomes a significant determinant of growth in Nigeria. Just as with net foreign aids, lower levels of net external debt were found to be growth enhancing, while excessive levels of net external debt were contractionary. This also confirms the presence of an inverted U-shaped relation between net external debt and economic growth in Nigeria over the short term. This result lends empirical support to the findings of Pattillo et al (2002, 2004) that the relationship between external debt and economic growth is nonlinear.

In addition, the results of post-estimation/diagnostic tests performed on the 20 models estimated in this study showed that all the models did not suffer from the important violations of the classical assumptions underlying linear regression models, such as, specification error, non-normality of the residuals, serial correlation in the residuals, and unequal residual variance, thereby springing up the conclusion that the models are adequate for policy prescription(s). Similarly, the result of redundancy test conducted on Model XIX by restricting two series, namely, the first and second lags of natural log of real GDP, to zero showed that both series were actually redundant since the associated probability is greater than 10% level of significance. This informs the presentation of the parsimonious version of Model XIX in this study, while the over-parameterized version of the model is not reported in order to save space. Lastly, across the 20 specifications, the adjusted R^2 ranged approximately between 98% and 99%, with the corresponding F-statistic ranging from 34.25 to 345.06. All these imply the high explanatory power and the overall significance of the 20 models.

Table 5: FDI-Growth Nexus

	Baseline Model	Alternative Models		
Variable	Model I	Model II	Model III	Model IV
$LRGDP_{t-1}$	-0.5529 (0.3464)	0.589***(0.199)	0.609***(0.201)	0.6619***(0.2048)
$LRGDP_{t-2}$	1.3092***(0.2713)	0.3746*(0.2058)	0.4692**(0.2036)	0.4149*(0.2145)
$LRGDP_{t-3}$	1.2228***(0.3403)			
GCF_t	-0.0135***(0.004)	-0.0068(0.0031)	0.0044 (0.0067)	-0.0038 (0.0027)
$LOILP_t$	0.1308**(0.0434)	0.0079(0.0254)	-0.0002 (0.0241)	0.0268 (0.0426)
$LOILP_{t-1}$	-0.1501**(0.0513)			
$LOILP_{t-2}$	-0.1349**(0.0502)			
$NFDI_t$	0.0037 (0.0038)	0.00104(0.0035)	0.0284 (0.0234)	0.0232 (0.0267)
$NFDI_{t-1}$	0.0109***(0.0033)			
$NFDI_{t-2}$	0.0072**(0.0032)			
$NFDI_{t-3}$	0.0068**(0.0036)			
$(GCF * NFDI)_t$			-0.0024 (0.0019)	
$(LOILP * NFDI)_t$				-0.0074 (0.0085)
$CRISIS$		0.1445*(0.0713)		
$(CRISIS * NFDI_t)$		-0.0261*(0.015)		
TOP_t	0.0012 (0.0007)	0.0001(0.0007)	-0.0003 (0.0007)	-0.0003 (0.0007)
TOP_{t-1}	0.0002 (0.0006)			
TOP_{t-2}	-0.0011 (0.0006)			
TOP_{t-3}	-0.0028***(0.001)			
TOP_{t-4}	-0.0029**(0.0009)			
C	-20.342***(4.022)	0.8317(1.9728)	-1.7018 (1.4309)	-1.6608 (1.5011)
Adj. R^2	0.9909	0.9846	0.9835	0.9829
F-stat	172.52 [0.0000]	217.97[0.0000]	231.26 [0.0000]	223.39 [0.0000]
Ramsey RESET	0.0155[0.9880]	0.3353[0.7413]	0.9349[0.3616]	1.2460[0.2279]
Normality test	0.508[0.775]	0.9514[0.6215]	0.518[0.771]	0.759[0.684]
Serial correlation test	0.6404[0.554]	1.4923[0.2529]	0.5397[0.5921]	0.3681[0.6971]
Heteroscedasticity test	1.7880[0.1895]	0.4653[0.8654]	0.4663[0.8473]	0.4913[0.8297]

***, **, * indicate the statistical significance of coefficients at 1%, 5% and 10% respectively; the values in parentheses and block brackets are, respectively, the standard errors and the probability values (p-values). These definitions apply to other models.

***Source**: Author's Computation*

Table 6: Portfolio flows-Growth Nexus

	Baseline Model	Alternative Models		
Variable	Model V	Model VI	Model VII	Model VIII
$LRGDP_{t-1}$	0.628***(0.197)	0.7001***(0.114)	0.1949 (0.2396)	0.582**(0.207)
$LRGDP_{t-2}$	0.466**(0.212)		0.7364**(0.2600)	0.497**(0.218)
$LRGDP_{t-3}$			0.5994*(0.2869)	
$DEPTH_t$	-0.0001 (0.0016)	0.0029(0.0019)	-0.0034 (0.0019)	0.0037 (0.0052)
$DEPTH_{t-1}$		0.0067**(0.003)	-0.0066**(0.003)	
GCF_t	-0.0031 (0.0029)	-0.0113**(0.005)	-0.0146*(0.0066)	-0.0041(0.003)
GCF_{t-1}			-0.0132*(0.0071)	
GCF_{t-2}			0.0111*(0.0059)	
GCF_{t-3}			-0.0179**(0.006)	
$(GCF * NPORT)_t$			0.0004**(0.0002)	
$(GCF * NPORT)_{t-1}$			0.0001**(0.00004)	
$(DEPTH * NPORT)_t$				-0.00007(0.0001)
$NPORT_t$	0.00001 (0.0004)	-0.0001(0.0004)	-0.0040**(0.0017)	0.0010 (0.0014)
$CRISIS$		0.3106***(0.101)		
$(CRISIS * NPORT_t)$		-0.008***(0.003)		
TOP_t	-0.0005 (0.0007)	0.0003(0.001)	-0.0006 (0.0008)	-0.0005 (0.0007)
TOP_{t-1}			0.0006 (0.0008)	
TOP_{t-2}			-0.0009 (0.0007)	
TOP_{t-3}			-0.0033***(0.001)	
C	-1.9521*(0.979)	6.4793**(2.4398)	-10.759***(2.218)	-1.6573 (1.0602)
Adj. R^2	0.9831	0.9850	0.9886	0.9828
F-stat	263.30[0.0000]	231.32(0.0000)	141.5202 [0.0000]	221.44[0.0000]
Ramsey RESET	0.8091[0.4280]	0.6372[0.5316]	1.0349[0.3277]	0.6931[0.4966]
Normality test	0.531[0.766]	0.7577[0.6846]	1.387[0.499]	1.122[0.570]
Serial correlation test	0.3414[0.7150]	1.1248[0.3465]	2.0924[0.1897]	0.4248[0.6608]
Heteroscedasticity test	0.4909[0.8077]	0.4337[0.8868]	1.1663[0.4135]	0.5268[0.8039]

***Source**: Author's Computation*

Table 7: Foreign Remittances-Growth Nexus

	Baseline Model	Alternative Models		
Variable	Model IX	Model X	Model XI†	Model XII
$LRGDP_{t-1}$	0.614***(0.185)	0.2335 (0.2581)		0.5545***(0.1834)
$LRGDP_{t-2}$	0.507**(0.202)	0.8047**(0.314)		0.6284***(0.2115)
$DEPTH_t$	0.0004 (0.0015)	-0.004**(0.002)	0.0237***(0.0054)	-0.0059 (0.0044)
$DEPTH_{t-1}$		0.0044*(0.0022)	0.0068 (0.0068)	
$DEPTH_{t-2}$			0.0048 (0.0058)	
$DEPTH_{t-3}$			-0.0131 (0.0059)	
GCF_t	-0.006*(0.003)	-0.01***(0.003)	0.026 (0.015)	-0.0065**(0.0029)
GCF_{t-1}			-0.0451**(0.0183)	
GCF_{t-2}			-0.0097 (0.0142)	
GCF_{t-3}			-0.0464***(0.011)	
$REMIT_t$	-0.0032(0.002)	0.0007 (0.0031)	0.0248 (0.0261)	-0.0167*(0.0090)
$REMIT_{t-1}$		-0.0016 (0.0040)	-0.0914**(0.0306)	
$REMIT_{t-2}$		0.0082 (0.0042)	-0.0051 (0.0249)	
$REMIT_{t-3}$			-0.1052***(0.019)	
TOP_t	-0.0007(0.001)	-0.00002 (0.001)	-0.0038*(0.0018)	-0.0005 (0.0006)
TOP_{t-1}		0.0013*(0.0007)	-0.0054**(0.0019)	
TOP_{t-2}		-0.00006 (0.001)	0.00001 (0.0016)	
TOP_{t-3}		-0.0022*(0.001)	-0.0029 (0.0018)	
$(GCF * REMIT)_t$			-0.0014 (0.0034)	
$(GCF * REMIT)_{t-1}$			0.0092**(0.0033)	
$(GCF * REMIT)_{t-2}$			0.0039 (0.0022)	
$(GCF * REMIT)_{t-3}$			0.0099***(0.0015)	
$(DEPTH * REMIT)_t$				0.0007 (0.0005)
$CRISIS$		0.2023*(0.0987)		
$(CRISIS * REMIT_t)$		-0.025**(0.009)		
C	-2.477**(0.972)	-0.6531 (2.2353)	22.8272***(0.403)	-3.7277***(1.249)
Adj. R^2	0.9848	0.9895	0.9626	0.9857
F-stat	293.204[0.000]	175.719 [0.000]	34.425 [0.000]	267.495 [0.000]
Ramsey RESET	0.1223[0.9039]	0.3969[0.6990]	0.3591[0.7433]	0.2449[0.8091]
Normality test	2.977[0.225]	4.418[0.109]	2.386[0.303]	2.009[0.366]
Serial correlation test	0.3211[0.7292]	1.7421[0.2243]	1.1938[0.4558]	0.5702[0.5753]
Heteroscedasticity test	0.4309[0.8500]	0.4523[0.9207]	0.4869[0.8783]	0.4674[0.8466]
Redundancy test	…….....	…….....	9.7229[0.0291]	…….....

†this is the parsimonious version of Model XI; restricted variables include $LRGDP_{t-1}$, $LRGDP_{t-2}$; to save space, the over-parameterized version is not presented. But it is available on request.

***Source**: Author's Computation*

Table 8: Aids-Growth Nexus

	Baseline Model	Alternative Models		
Variable	Model IX	Model X	Model XI	Model XII
$LRGDP_{t-1}$	0.6316***(0.1908)	0.6275***(0.1943)	0.6245***(0.1936)	0.6441***(0.2163)
$LRGDP_{t-2}$	0.4615**(0.2012)	0.3727*(0.2018)	0.4629**(0.2039)	0.4539*(0.2291)
$AIDS_t$	0.0002 (0.0017)	0.0006 (0.0017)	0.0086 (0.0131)	-0.0030(0.0076)
$AIDS_{t-1}$				0.0038(0.0105)
$AIDS_t^2$				0.00011(0.0003)
$AIDS_{t-1}^2$				-0.00013(0.0004)
GCF_t	-0.0030 (0.0025)	-0.0062 (0.0029)	0.0012 (0.0069)	-0.0039(0.0056)
GCF_{t-1}				0.0006(0.0069)
TOP_t	-0.0005 (0.0006)	0.0000178 (0.0007)	-0.0003 (0.0007)	-0.0002(0.0009)
TOP_{t-1}				-0.0003(0.0007)
$(GCF * AIDS)_t$			-0.0007 (0.0011)	
$CRISIS$		0.1527*(0.0763)		
$(CRISIS * AIDS_t)$		-0.0182*(0.0104)		
C	-1.9266**(0.7376)	0.0838 (1.3546)	-1.8613**(0.7542)	-2.0301*(1.0644)
Adj. R^2	0.9839	0.9853	0.9835	0.9799
F-stat	331.1257 [0.0000]	258.8700 [0.0000]	268.7784 [0.0000]	132.8596(0.0000)
Ramsey RESET	0.8385[0.4112]	0.1121[0.9120]	0.8229[0.4202]	0.8500[0.4079]
Normality test	0.493[0.781]	0.986[0.611]	0.460[0.794]	0.7477[0.6881]
Serial correlation test	0.3262[0.7255]	1.4327[0.2646]	0.340[0.7159]	0.3860[0.6863]
Heteroscedasticity test	0.4856[0.7833]	0.4772[0.8397]	0.3989[0.8713]	0.4864[0.8764]

***Source**: Author's Computation*

Table 9: External Debt-Growth Nexus

	Baseline Model	Alternative Models		
Variable	Model XIII	Model XIV	Model XV	Model XVI
$LRGDP_{t-1}$	0.629***(0.186)	0.553**(0.201)	0.602***(0.1927)	0.628***(0.18)
$LRGDP_{t-2}$	0.4474**(0.198)	0.454**(0.201)	0.4916**(0.2109)	0.4811**(0.193)
GCF_t	-0.0076 (0.0053)	-0.0094 (0.007)	-0.0052 (0.0066)	-0.0247*(0.012)
$NEXTD_t$	0.0024 (0.0025)	0.0021 (0.0041)	0.0063 (0.0064)	0.0199*(0.0115)
$NEXTD_t^2$				-0.0002 (0.0001)
TOP_t	0.0006 (0.0012)	0.0005 (0.0015)	0.0009 (0.0014)	0.0033 (0.0022)
$(GCF * NEXTD)_t$			-0.0002 (0.0004)	
$CRISIS$		0.0299 (0.0462)		
$(CRISIS * NEXTD_t)$		0.0008 (0.0027)		
C	-1.633**(0.713)	-0.0905 (1.789)	-2.0503**(0.957)	-2.555**(0.9119)
Adj. R^2	0.9845	0.9841	0.9841	0.9855
F-stat	345.057[0.000]	239.949[0.000]	280.333[0.000]	306.331[0.000]
Ramsey RESET	0.0474[0.9626]	0.2975[0.7693]	0.0978[0.9230]	0.4029[0.6913]
Normality test	0.743[0.689]	0.694[0.706]	0.987[0.610]	1.893[0.387]
Serial correlation test	0.5377[0.5923]	0.8626[0.4388]	0.2853[0.7549]	0.4166[0.6652]
Heteroscedasticity test	0.2537[0.9334]	0.2486[0.9667]	0.2068[0.9708]	0.2682[0.9457]

***Source**: Author's Computation*

5. Conclusion

The present study has extensively re-examined the actual relationship between foreign capital flows and economic growth in Nigeria between 1986 and 2015. Results showed that the unconditional short-run determinants of growth (based on the baseline models) are net FDI inflows, oil price, trade openness and domestic investment, whereas the conditional short-run determinants of growth (based on the alternative models) are net portfolio flows, financial depth, net external debt and net foreign remittances. Irrespective of the alternative specifications considered, net foreign aids received turned out to be the only insignificant determinant of growth in Nigeria. Besides, owing to absorptive capacity constraints, net FDI inflows exert weak positive influence on growth, while net portfolio flows and net foreign remittances have significant negative effects on growth. On the other hand, lower levels of net foreign aids and net external debt promote growth, while excessive levels of these flows dampen growth, thereby confirming the inverted U-shaped relation between foreign capital flows (in form of foreign aids and external debt) and economic growth. All these imply that the relationship between foreign

capital flows and economic growth in Nigeria is both linear and nonlinear. It is therefore recommended that policy makers in Nigeria encourage the inflow of capital that would be beneficial to the nation, in terms of stimulating domestic investment and economic growth. Putting measures in place to develop the nation's financial sector is also suggested to attract and make efficient use of capital flows in the country.

References

Adeleke, A.I. (2014). FDI-Growth Nexus in Africa: Does Governance Matter? *Journal of Economic Development*, 39(1), 111-135

Ajide, K.B. (2014). Determinants of Growth in Nigeria. *CBN Journal of Applied Statistics*, 5(2), 147-170

Agbloyor, E., Abor, J., Adjasi, C. and Yawson, A. (2014). Private Capital Flows and Economic Growth in Africa: The Role of Domestic Financial Markets. *Journal of International Financial Markets, Institutions and Money*, 2(3), 1-33

Akinlo, A. (2004). Foreign Direct Investment and Growth in Nigeria: An Empirical Investigation. *Journal of Policy Modeling*, 26, 627-639

Alley, I., Asekomeh, A., Mobolaji, H. and Adeniran, Y.A. (2014). Oil price shocks and Nigerian economic growth. *European Scientific Journal*, 10(19), 375-391

Baghebo, M. and Apere, T.O. (2014). Foreign Portfolio Investment and Economic Growth in Nigeria (1986-2010). *International Journal of Business and Social Science*, 5(11), 108-115

Burnside, C. and Dollar, D. (2000). Aid, Policies and Growth. *The American Economic Review*, 90(4), 847-868

Chenery, H. and Strout, A. (1966). Foreign Assistance and Economic Development. *American Economic Review*, 56(4), 679-733

Collier, P. and Dollar, D. (2002). Aid Allocation and Poverty Reduction. *European Economic Review*, 46, 1475-1500

Collier, P. and Hoeffler, A. (2004). Aid, Policy and Growth in Post-conflict Societies. *European Economic Review*, 48, 1125-1145

Durham, J.B. (2004). Absorptive capacity and the effects of Foreign Direct Investment and Equity Foreign Portfolio Investment on Economic Growth. *European Economic Review*, 48, 285-306

Easterly, W., Levine, R. and Roodman, D. (2004). Aid, Policies and Growth: Comment. *The American Economic Review*, 94(3), 774-780

Fedderke, J.W. and Romm, A.T. (2004). Growth Impact and Determinants of FDI into South Africa (1956-2003). University of Cape Town Working Paper No. 12

Feeny, S. and McGillivray, M. (2009). Aid Allocation to Fragile States: Absorptive Capacity Constraints. *Journal of International Development*, 21, 618-632

Guiliano, P. and Ruiz-Arranz, M. (2009). Remittances, Financial Development and Growth. *Journal of Development Economics*, 90, 144-152

Ilhan, O. (2007). Foreign Direct Investment-Growth Nexus: A Review of Recent Literature. *International Journal of Applied Econometrics and Quantitative Studies*, 4(2), 79-98

Jibir, A. and Abdu, M. (2017). Foreign Direct Investment-Growth Nexus: The Case of Nigeria. *European Scientific Journal*, 13(1), 304-318

Kolawole, B.O. (2013). Foreign Assistance and Economic Growth in Nigeria: The Two-Gap Model Framework. *American International Journal of Contemporary Research*, 3(10), 153-160

Luiz R. de Mello, Jr. (1997). Foreign Direct Investment in Developing Countries and Growth: A Selective Survey. *Journal of Development Studies*, 39(1), 1-34

Nyeadi, J., Yidana, N. and Imoro, M. (2014). Remittances and Economic Growth Nexus: Empirical Evidence from Nigeria, Senegal and Togo. *International Journal of Academic research in Business and Social Sciences*, 4(10), 158-172

Obiechina, M. E. and Ukeje, E.U. (2013). Economic Growth, Capital Flows, Foreign Exchange Rate, Export and Trade Openness in Nigeria. *International Journal of Economics and Management Sciences*, 2(9), 1-13

Okafor, I.G., Ugochukwu, U.S. and Chijindu, E.H. (2016). Foreign Capital Inflows and Nigerian Economic Growth Nexus: A Toda Yamamoto Approach. *European Journal of Accounting, Auditing and Finance Research*, 4(3), 16-26

Orji, A., Uche, A.S. and Ilori, E.A. (2014). Foreign Capital Inflows and Growth: An Empirical Analysis of WAMZ Experience. *International Journal of Economics and Financial Issues*, 4(4), 971-983

Osinubi, T.S. and Amaghionyeodiwe, L.A. (2010). Foreign Private Investment and Economic Growth in Nigeria. *Journal of Applied Econometrics and International Development*, 10(2), 189-204

Pattillo, C., Poirson, H. and Ricci, L. (2002). External Debt and Growth. IMF Working Paper No. WP/02/69

Pattillo, C., Poirson, H. and Ricci, L. (2004). What Are the Channels through which External Debt Affects Growth? IMF Working Paper No. 04/15

Pesaran, M.H., Shin, Y. and Smith, R.J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16, 289-326

Ramirez, M. (2000). Foreign Direct Investment in Mexico: A Cointegration Analysis. *The Journal of Development Studies*, 37(1), 138-162

Saibu, O.M. and Keke, N.D. (2014). Real Output Effects of FDI in Nigeria. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, vol. 2(1), 1-7

Sanusi, L.S. (2010). "Global Financial Meltdown and the Reforms in the Nigerian banking sector". CBN Governor's speech delivered in a Public Lecture at the Convocation Square of Abubakar Tafawa Balewa University, Bauchi on Friday, December, 10, 2010

Shen, C-H. (2010). What Makes International Capital Flows Promote Economic Growth? An International Cross-Country Analysis. *Scottish Journal of Political Economy*, 57(5), 515-546

Todaro, M. and Smith, S.C. (2012). *Economic Development* (11th Ed.). USA: Pearson Education Incorporated

Ugwebe, S.U., Okafor, I.G. and Akarogbe, C.A. (2016). The Effect of External Borrowing and Foreign Aid on Economic Growth in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 6(4), 115-175

Umoh, O.J., Jacob, A. O. and Chuku, C.A. (2012). Foreign Direct Investment and Economic Growth in Nigeria: An Analysis of Endogenous Effects. *Current Research Journal of Economic Theory*, 4(3), 53-66

World Bank, Global Development Finance (2000). Washington, D.C.