

Dynamic Interactions among Trade Openness, Foreign Private Capital Inflows and Economic Growth in Nigeria (1970 – 2014)

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Abstract

The paper examines the current campaigns for increased foreign capital inflows into Africa and greater openness in order to accelerate economic growth in the region. Using Nigerian annual data, the paper determines the validity of the campaigns for proper resolution of the issue. Data were gathered from the various Statistical Bulletins published by the Central bank of Nigeria. Using Granger causality techniques, the paper confirms that the level of foreign capital inflows caused economic growth while trade openness was caused prior by the level of economic growth. This result indicates that trade openness had not caused economic growth in the country. The result also shows that foreign private capital inflows and all its components had not Granger-caused trade openness while causality runs from trade openness to foreign private capital inflows. However, the results of the error correction models revealed that both trade openness and all components of foreign capital inflows have long run positive effect on economic growth in Nigeria. The paper opines that increased foreign private capital inflows would only be necessary for the Nigerian economy provided such capital inflows are made into all sectors of the economy simultaneously.

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I. Introduction

One major issue agitating the minds of economic researchers in recent times is how African countries can substantially increase their share of the world foreign private capital (FPC) inflows in a globalized world (Ngowi, 2001; Kandiero and Chitiga, 2003; Kyaw, 2003). The greater attention paid by researchers on this issue could be strongly attributed to the important roles that foreign private capital inflows play in development process. The general consensus in the literature remains that, through greater economic openness, and especially trade openness, higher foreign private capital inflows is encouraged to complement the domestic capital, which in turn stimulates growth (Chen *et al.*, 1995; Borenzstein *et al.*, 1998; Obwona, 1999). This general view is connected to the theoretical assertion that positive association exists between foreign capital and economic growth which has also been confirmed for many countries in most empirical literature (de Mello, 1996a and 1996b for studies on Latin America; Williams and Williams, 1999 for Eastern Caribbean countries; Koo, 1983, Choi and Hyun, 1991; Korean Development Bank, 1993 and Hong, 1997 for Korea and Taiwan; Poon and Thompson, 1998 for Asia and Latin America; de Mello, 1997 and 1999 for developing countries). Many other researchers however, disagree that foreign capital inflows always promote economic growth, particularly in developing countries (Jackman, 1982; Lipsey, (2002). Some of these studies opine that foreign capital inflows negatively linked with growth in most developing countries (Rothgeb, 1984; Saltz, 1992).

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If this view is valid, then the campaign for greater openness and higher FPC into the African continent may be a ruse. Such advocacy will only be appropriate if it is confirmed that countries in the African continent will benefit adequately from foreign capital inflows. Previous studies have, however, confirmed that some African countries that improved their business climate spectacularly in the 1990s and 2000s through trade openness, financial integration, and adoption of attractive privatization programmes and reforms of investment policies received high rates of foreign capital inflows (Barrell and Pain, 1997; Morisset, 1999). The issue that arises from this discussion is the question of whether FPC inflow causes economic growth or vice versa in the wake of trade openness with reference to the Nigerian economy.

Evidence that abounds in the literature on the effect of foreign capital inflows on the Nigerian economic growth performance produce mixed results. Existing evidence indicates that there is no general consensus on the effect of FPC inflows on economic growth in Nigeria. Evidence does not have strong support for FPC inflows as its influence on economic growth is inconclusive (Yaqub *et al.*, 2013; Folorunso, 2014). Evidence also indicates that performance of the non-oil sector is poor as a result of low FPC inflows into the sector of the economy as only the mining and oil sector attract higher foreign capital inflows with its attendant socio-economic problems. This view may partly be as a result of the highly regulated economy with trade barriers with the rest of the world. Aside from this, many of the studies did not recognize the important role that greater economic liberalization policy adopted by the Nigerian government plays in mobilizing FPC and growth promoting process. However, further studies by Asiedu (2002 and 2006), Bende-Nabende (2002) and Dupasquier and Osakwe (2006) showed that openness to trade promotes FDI to Africa.

The economic liberalization policy adopted in recent times which gives greater attention to widening the non-oil sector of the Nigerian economy with the rest of the world has also attracted FPC into sector such as telecommunication, agriculture, transportation and services to mention but few. This development might have altered the existing relationship between foreign capital inflow and growth of Nigeria. Taking advantage of large sample size and recent adoption of greater trade openness policy by the Nigerian government, the focus of this paper is to examine the causal relationship among openness, FPC inflows and economic growth and also determine if the current level of trade openness and FPC inflows really matter for economic growth in the country. In other words, the paper ascertains whether trade openness is capable of stimulating foreign private capital inflows necessary for sustainable economic growth in Nigeria.

The aim of this paper, therefore, is to determine if foreign capital inflows Granger-cause economic growth and also examine the effect it portends on growth in Nigeria. The paper will also determine if trade openness Granger-cause FPC inflows and economic growth in Nigeria. In order to achieve these aims, the remaining part of the paper is divided into the following sections: Section II focuses on the review of existing literature on FPC-growth nexus, trade openness-FPC nexus, and trade openness-growth nexus. Section III presents model specifications and analytical techniques. While section IV discusses the results and finding from the estimated models, section V concludes the paper.

II. Review of the Literature

In recent times, foreign capital inflow has been on the increase in developing countries. The unprecedented rise in foreign capital inflow into the developing countries, as evident in the literature may be attributed to trade and financial openness where developing countries integrate economically with the rest of the world. For instance, using the estimation of production functions, Choi and Hyun (1991) showed a very positive effect of foreign direct investment on Korea's manufacturing sector. Also studies by the Korean Development Bank (1993) and Hong (1997) based on a survey of firms with foreign financing concluded that foreign capital played a positive role on Korea's economic growth. The findings of these studies clearly indicate that foreign capital inflows, especially from the developed economics to the developing ones stimulate rapid economic growth of the host countries.

Nissanke and Stein (2003), however, observed that the pattern of cross-border financial flows has been extremely skewed and uneven. Few developing countries have been able to access these financial flows, with the bulk of non-foreign direct investment and foreign direct investment inflows going to a handful of emerging market economics. Similarly, Fernandez-Arias and Montiel (1996) observed that foreign interest rates have been the "push" factor driving capital inflows and determining their magnitude while country's credit worthiness plays a significant role in the timing and geographic destination of the new capital flows.

The paper argues that the recipient countries face a series of policy choices to respond effectively to the inflows. The paper concludes that a loss of creditworthiness caused by deterioration in domestic policy would stop inflows quickly and, depending on the circumstances, inflows may be replaced by substantial outflows and an outright balance of payments crisis which in turn retards economic growth. The paper further reveals that economic openness had led many developing countries to adopt trade and financial liberalization policies, which have the promise of favorable macroeconomic indicators such as higher domestic and foreign investments and rapid economic growth.

Hong (1997) in his study quantified the contributions that various types of foreign capital have made towards the growth of individual Korean industries during 1970-1990 period. By presenting some descriptive analysis on the changing pattern of foreign capital inflows in Korea, the study suggested that the success of Korea's manufacturing sector, the engine of economic growth, owes very much to foreign capital inflows. The study discovered that foreign direct investment (FDI) alone accounted for almost 20 per cent of the manufacturing growth. Although the exact figure was most likely to be incorrect, the study opined that the importance of foreign capital cannot be denied.

Given the growth potential roles of FDI, Ngowi (2001) examined whether African continent can increase its global share of FDI inflows. The study revealed that FDI generates employment, increases government revenue, and increases efficiency and competitiveness in an economy. Thus, it is beneficial to Africa. The study argues further that the African share of global FDI inflow is insignificant when compared with the remaining continents of the world. This implies that African continent has not received adequate level of FDI. Given the potential roles that FDI can play in the social and economic development of the continent, the study argues in support of the dire need to increase Africa's global share of FDI inflows. The study concludes, however, that African continent lacks most of the FDI determinants that would attract adequate FDI into the region. The study then suggests that Africa would attract substantial amount of FDI inflow if it can redeem its dented image, improve the efficiency of physical infrastructure and improve its low level of economic development. This finding is a clear indication that foreign capital inflow is not insulated from growth; hence a causal relation exists.

In a similar study by Kandiero and Chitiga (2006), the impact of economy wide trade openness on FDI inflow to Africa was examined. The study also observed that Africa's global share of FDI has lagged behind other regions in the world despite the sharp increase in FDI inflow to the region in recent times. The study argue that low global share of FDI to Africa emanates from perception of high corruption, weak governance, and poor infrastructures among others. The study analyzed the impact of FDI on openness in manufactured goods, primary commodities and services. Using cross-country data comprising of African countries, the study found that FDI to GDP ratio responds well to increased openness in the whole continent and particularly in the service sector. This is a clear indication that foreign capital inflows and growth are not insulated from economic openness.

Examining why the foreign direct investments are attracted to some countries but not to many others in the developing countries in a globalized world, Kyaw (2003) explained that investment climate is a major factor responsible for such disparity. The study, like others, recognized that FDI can contribute to economic development in the developing countries. The study therefore advocated for measures that can stimulate FDI in the developing countries which include the creation of domestic macroeconomic policy attractive to foreign investors, adoption of open trade regime and creation of large market size as dictated by a country's gross domestic product. The study concluded that developing countries can increase their attractiveness to foreign investors by reducing the impediments to capital movement.

In another study, Dupasquier and Osakwe (2006) examined the performance, promotion, and prospects for foreign direct investment in Africa. Factors such as political and macroeconomic instability, low growth, weak infrastructure, poor governance, inhospitable regulatory environments, and ill-conceived investment promotion strategies were identified as responsible for the poor FDI record of the region. The paper stressed the need for more trade and investment relations between Africa and Asia. It also argued that countries in the region should pay more attention to the improvement of relations with existing investors and offer them incentives to assist in marketing domestic investment opportunities to potential foreign investors. The paper argued that the current wave of globalization sweeping through the world has intensified the competition for FDI among developing countries. The paper thus concluded that concerted efforts would be needed at the national, regional, and international levels to attract significant investment flows to Africa and improve the prospects for sustained growth and development.

Some other studies indicate that macroeconomic policy stability will attract greater FDI, while instability will discourage it. It is also greatly observed in the literature that low level of openness serves as impediment to higher foreign capital inflows and rapid economic growth, while many other authors found that openness attracts higher FDI which also acts as economic growth stimulant. For instance, observing that the share of the world trade accounted for by the multinational enterprises in Europe has risen in recent times, Borell and Pain (1997) examined those factors behind the continued growth of FDI in the region and its consequences on home and host countries. The paper found that the acquisition of firm-specific knowledge-based assets is an important factor behind the growth of FDI. The finding clearly indicates that trade openness is a key factor to FDI recovery and accelerated economic growth.

Critics of openness and FDI, however, argue that it portends harmful effect on host economy especially if the host country depends mainly on primary sector for its growth. This may be the case in Nigeria where the economy depends strongly on oil sector ; hence, the hypothesis which indicates that foreign capital inflows lead to economic growth may not be valid, while its reverse may be the case. For instance, Rodrik (1998) observed that openness to trade partly contributes positively to post-war growth of European countries but fails to adequately account for the pattern of post-war growth in East Asian countries. However, Gulati (1978) examined some of the arguments of the critics of foreign aid and other capital inflows to less developed countries (LDCs). The paper noted that the critics lack sufficient evidence on the supposedly adverse effect of capital transfers to LDCs on their saving and growth of incomes. The paper explained that the finding does not mean that capital inflows always promote growth in LDCs. In particular, it is shown that the relative importance of foreign capital on economic growth of LDCs would depend on the degree to which that growth is constrained by inadequate capital.

Several studies on Africa and Nigeria have reported conflicting results on the relationship among openness, foreign capital inflows and economic growth. Studies by Bhattacharya *et al.* (1997), Morisset (2000), Ezzo (2010), Inshah (2013) and Calderon and Nguyen (2015) examined whether domestic output growth helps in attracting capital inflows, which in turn help boost output growth in a set of 38 Sub-Saharan African countries. The paper found that output growth in sub-Saharan Africa does not attract capital inflows but FDI inflows enhance growth. Also, studies linking foreign capital inflows to economic growth in Nigeria provide conflicting results (Oyinlola, 1995; Akinlo, 2004; Ilemona, 2010; Omoniyi and Oyinlola, 2011; Imoudu, 2012)

One major problem of these studies is the failure to empirically test for causal relation among openness, foreign private capital (FPC) inflows and economic growth in Africa. The issue here is to empirically determine the direction of causation among openness, FPC inflows and growth. The questions that readily come to mind from the literature are whether causality among openness, FPC inflows and growth are bi-directional or uni-directional. It follows therefore that the issues of the directions of causality have not been extensively examined in empirical literature as most studies didnot address these crucial questions. The causal relationship is imperative for appropriate policy advocacy especially in the developing countries where rapid and sustainable economic growth is mostly required. Providing answers to the directions of causality among openness, FPC inflows and growth will immensely assist developing countries, like Nigeria, in knowing the required level of openness and FPC inflows that will promote accelerated economic growth. There is, therefore, the need to examine these issues in African continent using country-specific investigation. This paper fills this gap by using Nigeria as a case study.

III. Model Specifications and Analytical Techniques

In order to determine causal relationships among openness, foreign capital inflows and economic growth, pairwise Granger causality test procedure was adopted. Testing causality, in the Granger sense, involves using F -tests to confirm whether lagged information on a variable X provides any statistically significant information about the level of variable Y in the presence of lagged information of variable Y . If not, then X does not Granger-cause Y . Using annual data and the rule of thumb, the paper assumed a particular autoregressive lag length $p(p= 2)$ and estimated the following unrestricted equation by ordinary least squares (OLS):

$$Y_t = c_1 + \sum_{i=1}^p \alpha_i Y_{t-i} + \sum_{i=1}^p \beta_i X_{t-i} + u_t \quad \dots\dots\dots (1)$$

F -test of the null hypothesis that ‘ X does not Granger-cause’ was conducted by estimating the following restricted equation also by OLS:

$$Y_t = c_1 + \sum_{i=1}^p \alpha_i Y_{t-i} + e_t \quad \dots\dots\dots (2)$$

The respective sums of squared residuals (RSS) of equations (1) and (2) were then compared and these are:

$$RSS_1 = \sum_{t=1}^T \hat{u}_t^2 \quad \text{and} \quad RSS_2 = \sum_{t=1}^T \hat{e}_t^2 \quad \dots\dots\dots (3)$$

The test statistics then becomes:

$$F_{cal} = \frac{(RSS_2 - RSS_1) / p}{RSS_1 / T - 2p - 1} \quad \sim \quad F_{p, T-2p-1} \quad \dots\dots\dots (4)$$

If the test statistics is greater than the specified critical value, then the null hypothesis that “X does not Granger-cause Y would be rejected. E-View estimation package was employed to test the hypotheses that ‘openness does not Granger-cause foreign capital inflows’, ‘openness does not Granger-cause economic growth’ and ‘foreign capital inflows does not Granger-cause economic growth’. The same procedure was used to test whether ‘foreign capital inflows openness does not Granger-causes openness’ and if ‘foreign capital does not Granger-cause economic growth’ in the Nigerian situation.

The paper employed seven different components of foreign capital inflows into equation (1) ; this allowed us to determine components of foreign capital inflows that are causing openness and economic growth. The seven components of foreign private investment (FPI) based on types of economic activity used are mining and quarrying (FPIMIN), manufacturing and processing (FPIMAN), agriculture, forestry and fisheries (FPIAGR), transport and communication (FPITTC), building and construction (FPIBUC), trading and business services (FPITBS) and miscellaneous services (FPIMIS). Real gross domestic product (RGDP) were used as measures of economic growth while the ratio of total trade to GDP was employed as openness measure. Openness was further divided into oil and non-oil trade openness. The results of the Granger causality tests are reported in Tables 1, 2, and 3. In order to further determine the effects of openness (OPEN) and foreign capital inflows (FCI) on growth, the paper adopted endogenous growth model which assumes that the level of output (measured by the Gross Domestic Product, GDP) depends strongly on the level of capital and the existing level of technology and other auxiliary variables. Recognizing the domestic capital (measured by Gross Fixed Capital Formation, GFCF), rate of inflation (INF) and foreign capital (measured by Foreign Private Capital - FPC Inflows) and the extent of openness (measured by the ratio of total trade to output, OPEN), the semi logarithmic form of endogenous growth model estimated is specified as:

$$\log_e GDP_t = \beta_0 + \beta_1 \log_e GFCF_t + \beta_2 INF + \beta_3 \log_e OPEN + \beta_4 \log_e FPC_t + u_t$$

$$\beta_1 > 0, \beta_2 < \text{or} > 0, \beta_3 > 0, \beta_4 > 0 \quad \dots\dots\dots (5)$$

Time series data were gathered from the various Statistical Bulletins published by the Central Bank of Nigeria. The sample observation covers a period of forty-six years spanning from 1970 to 2015.

In order to avoid spurious regression result, we first examined the properties of each time series in equation (5) using Augmented Dickey-Fuller tests to confirm if series are stationary or not. These were carried out using Johansen co-integration tests to check whether the explanatory variables in the equation co-integrate with the variable to be explained; that is, whether there exists any long-run relationship. In the first step of Johansen co-integration, we estimated the equation using the levels of the series. In the second step, the estimated residuals from the equations were tested for stationarity again, using the Augmented Dickey-Fuller tests (see Engle and Granger, 1987). Finally, equation (5) was estimated using error correction modeling techniques in which both the short run and long run relationships among growth, openness and foreign capital were determined.

IV. Interpretation of Findings

The results of the properties of the time series employed are reported in Table 1. The ADF test statistics reported in the second and third columns of Table 1 clearly revealed the existence of unit root in all series. The results show that all series were not stationary at level while they were only stationary at first difference, given the 5% Mackinnon critical values reported in the last row of Table 1, except for inflation rate. These series are, indeed, I(1) series as the critical value of -2.9286 is lower than all the reported ADF statistics at level and the critical value of -2.9303 is higher than all the reported ADF statistics at first difference, thus accepting the existence of unit root. The existence of unit root in all series implies that the series wereto be differenced once only in the estimation of all other equations in order to avoid spurious models.

Table 1: Results of Augmented Dickey-Fuller (ADF) Unit Root Tests (1970 – 2015)

Name of Time Series	ADFStatistic at Level	ADF Statistic at First Difference	Remarks
Log of Real GDP (<i>lnRGDP</i>)	-2.618304	-4.853231	I(1) Series
Log of Nominal GDP (<i>lnNGDP</i>)	-0.383714	-4.230999	I(1) Series
Log of Gross Fixed Capital Formation (<i>lnGFCF</i>)	0.130264	-4.023992	I(1) Series
Log of Total Foreign Private Capital (<i>lnFPC</i>) Inflows	-0.416789	-8.445346	I(1) Series
Inflation Rate (%)	-3.678436	=====	I(0) Series
Log of Cumulative Foreign Private Capital (<i>lnCFPC</i>) Inflows	-0.754583	-3.464596	I(1) Series
Log of Mining FPC (<i>lnMIN</i>)	-1.518450	-4.333547	I(1) Series
Log of Manufacturing FPC (<i>lnMAN</i>)	-1.524947	-3.130071	I(1) Series
Log of Agriculture FPC (<i>lnAGRFPC</i>)	-0.264739	-4.339869	I(1) Series
Log of Transport & Telecom FPC (<i>lnTTEL</i>)	0.919860	-8.182347	I(1) Series
Log of Building & Construction FPC (<i>lnBCON</i>)	-2.446040	-6.955275	I(1) Series
Log of Trading & Business Service FPC (<i>lnTBS</i>)	-0.013219	-4.017118	I(1) Series
Log of Miscellaneous FPC (<i>lnMISC</i>)	-1.713545	-5.402847	I(1) Series
Log of Oil Exports (<i>lnOILEXP</i>)	-1.149625	-5.215677	I(1) Series
Log of Non-Oil Exports (<i>lnNOILEXP</i>)	0.006851	-3.861992	I(1) Series
Log of Total Exports (<i>lnTEXP</i>)	-0.977670	-5.267403	I(1) Series
Log of Oil Imports (<i>lnOILIMP</i>)	-0.566289	-5.526734	I(1) Series
Log of Non-Oil Imports (<i>lnNOILIMP</i>)	-0.707020	-4.432022	I(1) Series
Log of Total Imports (<i>lnTIMP</i>)	-0.719725	-4.219482	I(1) Series
Total Trade/NGDP (<i>OPEN1</i>)	-1.745085	-5.829995	I(1) Series
Total Trade/RGDP (<i>OPEN2</i>)	0.435888	-5.214208	I(1) Series
Total Oil Trade/NGDP (<i>OPEN3</i>)	-2.144728	-6.623226	I(1) Series
Total Oil Trade/RGDP (<i>OPEN4</i>)	-0.249237	-5.832127	I(1) Series
Total Non-Oil Trade/NGDP (<i>OPEN5</i>)	-2.416272	-6.553963	I(1) Series
Total Non-Oil Trade/RGDP (<i>OPEN6</i>)	1.141231	-5.268993	I(1) Series
5% MacKinnon Critical Values for the Rejection of Hypothesis of a unit root	-2.9286	-2.9303	None

Source: Estimates from E-view Econometric Package

The issue of whether the campaign for increased foreign private capital (FPC) inflows is relevant for the Nigerian economy was determined by examining the direction of causation between the measures of economic growth, namely; nominal economic growth (NGDP), real economic growth (RGDP), and FPC inflows and its various components using pair-wise Granger causality tests. All series were measured in natural logarithm form and the results are reported in Table 2. The results of the non-rejection of the pair-wise causality hypotheses indicating that both pair series were independent of one another are not reported in the Table. The Granger causality results reported in Table 2 show strong support for uni-directional causality. At the aggregate level, evidence of uni-directional causality run only from nominal GDP (NGDP) to FPC inflows as well as real GDP (RGDP) to FPC without the reverse causality at 5% level of significance as the tests failed to reject the null hypothesis of causality. At the disaggregated level, the nominal GDP (NGDP) also caused FPC inflows into agriculture (AGR), business and construction (BCON), Mining (MIN), miscellaneous (MISC), trade and business services (TBS) and transport and telecommunication (TTEL) without reverse causation while FPC inflows into manufacturing (MAN) caused nominal GDP (NGDP) without opposite causation. There was, however, no evidence of causality between all components of FPC inflows and real GDP except for building and construction (BCON) and real GDP (RGDP) where bi-directional causality was reported; hence, RGDP and components of FPC are independent of one another except for RGDP and BCON. The results, therefore, seem to confirm a uni-directional causality from economic growth to FPC with a weak bi-directional causality from real economic growth to FPC and a strong evidence of FPC not causing growth.

This finding runs contrary to most findings in economic literature in which foreign capital inflows had been reported to have caused economic growth. It follows from this finding that rather than examining the factors that determine FPC in the country, the attention of the paper was focused on how FPC could be made to stimulate growth in Nigeria. Addressing this issue, the paper thus examined the components of FPC that impacts positive effects on economic growth in the country.

Table 2: Pair-wise Granger Causality Test Results for FPC Inflows and GDP (1970-2015)

Null Hypothesis:	Observation	F-Statistic	Probability
<i>ln</i> FPC does not Granger Cause <i>ln</i> NGDP	45	0.74838	0.39190
<i>ln</i> NGDP does not Granger Cause <i>ln</i> FPC		16.4918***	0.00021
<i>ln</i> FPC does not Granger Cause <i>ln</i> RGDP	45	0.28914	0.59361
<i>ln</i> RGDP does not Granger Cause <i>ln</i> FPC		9.33891***	0.00389
<i>ln</i> AGR does not Granger Cause <i>ln</i> NGDP	45	1.88363	0.17721
<i>ln</i> NGDP does not Granger Cause <i>ln</i> AGR		4.01215**	0.04165
<i>ln</i> BCON does not Granger Cause <i>ln</i> NGDP	45	0.67772	0.41502
<i>ln</i> NGDP does not Granger Cause <i>ln</i> BCON		9.66681***	0.00336
<i>ln</i> MAN does not Granger Cause <i>ln</i> NGDP	45	3.06220**	0.04744
<i>ln</i> NGDP does not Granger Cause <i>ln</i> MAN		0.45961	0.50153
<i>ln</i> MIN does not Granger Cause <i>ln</i> NGDP	45	4.27878	0.04478
<i>ln</i> NGDP does not Granger Cause <i>ln</i> MIN		0.03448**	0.85358
<i>ln</i> MISC does not Granger Cause <i>ln</i> NGDP	45	2.79807	0.10181
<i>ln</i> NGDP does not Granger Cause <i>ln</i> MISC		5.17777**	0.02804
<i>ln</i> TBS does not Granger Cause <i>ln</i> NGDP	45	1.61874	0.21027
<i>ln</i> NGDP does not Granger Cause <i>ln</i> TBS		4.67958**	0.03626
<i>ln</i> TTEL does not Granger Cause <i>ln</i> NGDP	45	0.41177	0.52456
<i>ln</i> NGDP does not Granger Cause <i>ln</i> TTEL		6.62500**	0.01367
<i>ln</i> BCON does not Granger Cause <i>ln</i> RGDP	45	3.08975*	0.08607
<i>ln</i> RGDP does not Granger Cause <i>ln</i> BCON		5.35044**	0.02569

Note: ***, ** and * indicate significant at 1%, 5% and 10% level of significance respectively

Source: Estimates from E-view Econometric Package

Similar causality issue concerning economic growth and various measures of openness (OPEN) were also tested using pair-wise Granger causality tests. The results reported in Table 5 show a weak bi-directional causality between two measures of openness (OPEN2 and OPEN6) and nominal GDP (NGDP). Uni-directional causation was, however, found between openness (OPEN4) and nominal GDP (NGDP) while all measures of openness and real GDP (RGDP) were independent of one another at 5% level of significance. The results of causal relationship between openness and foreign private capital are reported in Table 4 which clearly indicates that various measures of economic openness (OPEN) caused foreign private capital (FPC) inflows in the Granger sense while the opposite causation was not confirmed at 5% level of significance. The finding implies that causality runs from openness to foreign capital inflows with advocacy for adequate policy at stimulating greater openness that will attract higher capital inflows into the Nigerian economy.

Table 3: Pair-wise Granger Causality Test Results for Openness and Economic Growth (1970-2015)

Null Hypothesis:	Observation	F-Statistic	Probability
OPEN2 does not Granger Cause \ln NGDP	45	2.78430*	0.09263
\ln NGDP does not Granger Cause OPEN2		6.26188**	0.01632
OPEN4 does not Granger Cause \ln NGDP	45	2.46577	0.12385
\ln NGDP does not Granger Cause OPEN4		6.14013**	0.01732
OPEN6 does not Granger Cause \ln NGDP	45	2.69473*	0.09815
\ln NGDP does not Granger Cause OPEN6		5.87419**	0.01975

Note: ** and * indicate significant at 5% and 10% level of significance respectively

Source: Estimates from E-view Econometric Package

Table 4: Pair-wise Granger Causality Test Results for Openness and FPC (1970-2015)

Null Hypothesis:	Observation	F-Statistic	Probability
OPEN2 does not Granger Cause \ln FPC	45	3.88153**	0.04544
\ln FPC does not Granger Cause OPEN2		1.61206	0.21119
OPEN4 does not Granger Cause \ln FPC	45	3.93244**	0.04393
\ln FPC does not Granger Cause OPEN4		2.09886	0.15483
OPEN5 does not Granger Cause \ln FPC	45	3.36283**	0.04978
\ln FPC does not Granger Cause OPEN5		3.65532*	0.06273
OPEN6 does not Granger Cause \ln FPC	45	3.14069*	0.08362
\ln FPC does not Granger Cause OPEN6		1.11598	0.29682

Note: ** and * indicate significant at 5% and 10% level of significance respectively

Source: Estimates from E-view Econometric Package

Causality was also examined among the various components of cumulative foreign private capital (FPC) inflows and openness; the results, which are mixed in nature, are reported in Table 5. While the cumulative FPC inflows on agriculture (AGR) and trade and business services (TBS) were caused by some measures of openness (OPEN2, OPEN4 and OPEN6), the reverse causality was not found at 5% level of significance. The result is, however, different for cumulative FPC inflows on building and construction (BCON) where BCON was not insulated by openness, but causality only runs from cumulative FPC inflows on BCON to some measures of openness (OPEN1, OPEN2, OPEN4 and OPEN6) at 5% level of significance. Similar results, where causality also runs from cumulative FPC inflows on transport and telecommunication (TTEL) to some measures of openness without reverse causality at 5% level of significance were reported. There is, however, weak bi-directional causality between cumulative FPC inflows on miscellaneous services (MISC) and openness at 10% level of significance. Evidence of strong bi-directional causality was, however, found between cumulative FPC inflows on mining (MIN) and openness at 5% level of significance. Similarly, bi-directional causation was found between cumulative foreign capital inflows on manufacturing (MAN) and openness at 5% level of significance. These findings conform with most other findings in the literature in which openness had been reported to cause foreign capital inflows and vice versa.

Table 5: Pair-wise Granger Causality Test Results for Openness and Components of FPC (1970-2015)

Null Hypothesis:	Observation	F-Statistic	Probability
OPEN2 does not Granger Cause <i>ln</i> AGR	45	5.00357**	0.03066
<i>ln</i> AGR does not Granger Cause OPEN2		0.18560	0.66881
OPEN4 does not Granger Cause <i>ln</i> AGR	45	4.55679**	0.03867
<i>ln</i> AGR does not Granger Cause OPEN4		0.48563	0.48972
OPEN6 does not Granger Cause <i>ln</i> AGR	45	4.98344**	0.03098
<i>ln</i> AGR does not Granger Cause OPEN6		0.19935	0.65754
OPEN2 does not Granger Cause <i>ln</i> TBS	45	6.91921**	0.01187
<i>ln</i> TBS does not Granger Cause OPEN2		0.73394	0.39647
OPEN4 does not Granger Cause <i>ln</i> TBS	45	5.49906**	0.02383
<i>ln</i> TBS does not Granger Cause OPEN4		1.23623	0.27252
OPEN6 does not Granger Cause <i>ln</i> TBS	45	7.57883***	0.00869
<i>ln</i> TBS does not Granger Cause OPEN6		1.15980	0.28765
OPEN1 does not Granger Cause <i>ln</i> BCON	45	0.62589	0.43331
<i>ln</i> BCON does not Granger Cause OPEN1		0.01878**	0.89164
OPEN2 does not Granger Cause <i>ln</i> BCON	45	1.38865	0.24527
<i>ln</i> BCON does not Granger Cause OPEN2		4.57726**	0.03826
OPEN4 does not Granger Cause <i>ln</i> BCON	45	1.66915	0.20344
<i>ln</i> BCON does not Granger Cause OPEN4		4.08487**	0.04967
OPEN6 does not Granger Cause <i>ln</i> BCON	45	0.80397	0.37502
<i>ln</i> BCON does not Granger Cause OPEN6		4.28354**	0.04467
OPEN2 does not Granger Cause <i>ln</i> TTEL	45	0.92541	0.34156
<i>ln</i> TTEL does not Granger Cause OPEN2		8.38441***	0.00598
OPEN4 does not Granger Cause <i>ln</i> TTEL	45	1.66683	0.20374
<i>ln</i> TTEL does not Granger Cause OPEN4		7.62742***	0.00849
OPEN6 does not Granger Cause <i>ln</i> TTEL	45	0.01911	0.89070
<i>ln</i> TTEL does not Granger Cause OPEN6		8.26328***	0.00632
OPEN1 does not Granger Cause <i>ln</i> MIN	45	6.22437**	0.01662
<i>ln</i> MIN does not Granger Cause OPEN1		0.03998	0.84249
OPEN2 does not Granger Cause <i>ln</i> MIN	45	0.19375	0.66207
<i>ln</i> MIN does not Granger Cause OPEN2		4.85779**	0.03306
OPEN3 does not Granger Cause <i>ln</i> MIN	45	9.05121**	0.00442
<i>ln</i> MIN does not Granger Cause OPEN3		0.26261	0.61101
OPEN6 does not Granger Cause <i>ln</i> MIN	45	0.60185	0.44222
<i>ln</i> MIN does not Granger Cause OPEN6		6.74703**	0.01289
OPEN1 does not Granger Cause <i>ln</i> MAN	45	3.61807*	0.06403
<i>ln</i> MAN does not Granger Cause OPEN1		0.08540	0.77155
OPEN2 does not Granger Cause <i>ln</i> MAN	45	2.30244	0.13666
<i>ln</i> MAN does not Granger Cause OPEN2		7.15348**	0.01062
OPEN3 does not Granger Cause <i>ln</i> MAN	45	4.47759**	0.04031
<i>ln</i> MAN does not Granger Cause OPEN3		0.01131	0.91580
OPEN4 does not Granger Cause <i>ln</i> MAN	45	1.34862	0.25208
<i>ln</i> MAN does not Granger Cause OPEN4		6.53376**	0.01429
OPEN6 does not Granger Cause <i>ln</i> MAN	45	4.45915**	0.04071
<i>ln</i> MAN does not Granger Cause OPEN6		6.05773**	0.01804
OPEN2 does not Granger Cause <i>ln</i> MISC	45	0.21336	0.64653
<i>ln</i> MISC does not Granger Cause OPEN2		3.71794*	0.06061
OPEN3 does not Granger Cause <i>ln</i> MISC	45	2.83942*	0.09940
<i>ln</i> MISC does not Granger Cause OPEN3		0.21344	0.64647
OPEN4 does not Granger Cause <i>ln</i> MISC	45	0.16957	0.68259
<i>ln</i> MISC does not Granger Cause OPEN4		4.01964*	0.05145

Note: ***, ** and * indicate significant at 1%, 5% and 10% level of significance respectively

Source: Estimates from E-view Econometric Package

The result of the estimated long run nominal growth model in which the effects of openness and foreign private capital (FPC) inflows are determined is reported in Table 6. The results in Table 6 indicate that some components of FPC inflows: notably mining (MIN), manufacturing (MAN), transport and telecommunication (TTEL) and trade and business services (TBS) impacted significant positive effect on economic growth while FPC

inflows on miscellaneous (MISC) and building and construction (BCON) bear insignificant positive influence, just as FPC inflows on agriculture (AGR) portend insignificant negative effect on economic growth. The results imply that the campaign for increased foreign capital is acceptable in those sectors where FPC inflows bring positive impact on the economy and also advocate for policy that will reverse the negative and insignificant effect of FPC inflows into the other sectors.

Table 6: Long Run Nominal GDP Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.636038	0.553074	2.958081	0.0056
LGFCF	0.470547	0.072389	6.500224	0.0000
INF	0.002019	0.001852	1.090282	0.2833
OPEN3	1.321395	0.406292	3.252330	0.0026
OPEN5	-0.922813	0.637639	-1.447235	0.1570
LMIN	0.073703	0.037087	1.987291	0.0510
LMAN	0.266233	0.116080	2.293525	0.0281
LAGR	-0.087808	0.049070	-1.789462	0.0825
LBCON	0.015957	0.049392	0.323064	0.7486
LTTEL	0.275249	0.106187	2.592118	0.0140
LTBS	0.162470	0.051309	3.166503	0.0033
LMISC	0.070130	0.044912	1.561510	0.1277
R-squared	0.997912	Mean dependent var		13.52776
Adjusted R-squared	0.997236	S.D. dependent var		3.134729
S.E. of regression	0.164804	Akaike info criterion		-0.548666
Sum squared resid	0.923448	Schwarz criterion		-0.071629
Log likelihood	24.61931	F-statistic		1476.993
Durbin-Watson stat	1.964663	Prob(F-statistic)		0.000000
ADF Test Statistic	-5.793166	1% Critical Value*		-2.6155
		5% Critical Value		-1.9483
		10% Critical Value		-1.6197

*MacKinnon critical values for rejection of hypothesis of a unit root.

Source: Estimates from E-view Econometric Package

The effect of openness on growth is also mixed. While oil trade openness impacted significant positive effect, non-oil trade openness impacted strong negative effect on growth. This result is also expected as the export sector of the Nigerian economy is strongly dominated by the oil sector while efforts at promoting non-oil sector have not yielded the expected structural change in export sector. This result could be interpreted that the country should intensify its effort at liberalizing the non-oil sector. Too much concentration on oil sector may not be too good for the economy in the long run.

The result of the estimated long run real growth model in which the effects of openness and foreign private capital (FPC) inflows are determined is reported in Table 7. The results clearly reveal that only FPC inflows into manufacturing (MAN) and trade and business services (TBS) impacted significant positive effects on economic growth while FPC inflows on agriculture (AGR), building and construction (BCON), and miscellaneous (MISC) bear insignificant positive influence, while FPC inflows on mining (MIN) and transport and telecommunication (TTEL) bear significant and insignificant negative effects on economic growth respectively at 5% level of significance.

Table 7: Long Run Real GDP Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.202182	1.453993	2.202337	0.0345
LGFCF	0.145883	0.197856	0.737319	0.4660
INF	0.008847	0.004772	1.853906	0.0724
OPEN4	-0.068566	0.044517	-1.540201	0.1328
OPEN6	-0.253661	0.115613	-2.194050	0.0352
LMIN	-0.333183	0.093515	-3.562893	0.0011
LMAN	0.628708	0.272950	2.303384	0.0275
LAGR	0.027502	0.119862	0.229447	0.8199
LBCON	0.155683	0.133765	1.163858	0.2526
LTTEL	-0.070524	0.230157	-0.306416	0.7612
LTBS	0.449748	0.123842	3.631623	0.0009
LMISC	0.061619	0.105785	0.582489	0.5641
R-squared	0.945661	Mean dependent var		12.06198
Adjusted R-squared	0.928081	S.D. dependent var		1.548641
S.E. of regression	0.415311	Akaike info criterion		1.299878
Sum squared resid	5.864417	Schwarz criterion		1.776915
Log likelihood	-17.89719	F-statistic		53.79114
Durbin-Watson stat	1.918734	Prob(F-statistic)		0.000000
ADF Test Statistic	-5.048017	1% Critical Value*		-2.6155
		5% Critical Value		-1.9483
		10% Critical Value		-1.6197

*MacKinnon critical values for rejection of hypothesis of a unit root.

Source: Estimates from E-view Econometric Package

The effect of openness on real growth is also mixed. While oil trade openness impacted insignificant negative effects, non-oil trade openness bears significant negative effects on real growth. This result is also supporting existing studies as the export sector of the Nigerian economy is strongly dominated by oil sector. This result could again be interpreted that the country should intensify its effort at liberalizing the non-oil sector.

However, given the non-stationarity of the series in the models and that series are, indeed, $I(1)$, the paper tested for the possible existence of co-integration between growth and its identified determinants in order to avoid spurious regression. Unit root tests were performed on the residual terms of the long run growth model using ADF tests ; the results are reported in the lower part of Table 6 and Table 7 for nominal and real growth respectively. The results clearly indicate that the residual terms are stationary at levels; confirming the existence of co-integration and indeed, the existence of long run relationship at 5% level of significance. The general ECM models which combine the effects of both the short run and long run of the series were then estimated and the results are reported in Table 8 and Table 9 for nominal and real growth respectively.

The ECM results reported in Table 8 clearly indicate that the current and lagged levels of the various components of foreign private capital series possess insignificant influence on the growth rate of nominal income series (LNGDP) of the nation's economy at 5% level of significance. Similar result is reported for the rate of real income as reported in Table 9. The implication of the result is that foreign private capital does not have noticeable effect on growth in the short run but support strong influence in the long run as indicated by the coefficients of ECM in both models.

Table 8: Error Correction Modeling (ECM) for Nominal Economic Growth (LNGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006079	0.050910	0.119415	0.9062
D(LNGDP(-1))	-0.189729	0.239652	-0.791685	0.4383
D(LGFCF)	0.554152	0.138456	4.002357	0.0008
D(LGFCF(-1))	0.049239	0.128641	0.382764	0.7061
INF	0.004693	0.002193	2.140465	0.0455
INF(-1)	0.000494	0.001961	0.251784	0.8039
D(OPEN3)	0.408569	0.420778	0.970985	0.3438
D(OPEN3(-1))	-0.169887	0.406784	-0.417634	0.6809
D(OPEN5)	-1.775745	0.651283	-2.726534	0.0134
D(OPEN5(-1))	-0.756126	0.573385	-1.318706	0.2029
D(LMIN)	0.010034	0.038651	0.259606	0.7980
D(LMIN(-1))	-0.038747	0.038114	-1.016609	0.3221
D(LMAN)	0.131975	0.122508	1.077276	0.2948
D(LMAN(-1))	0.074183	0.156497	0.474021	0.6409
D(LAGR)	0.009678	0.065108	0.148643	0.8834
D(LAGR(-1))	0.080886	0.067882	1.191580	0.2481
D(LBCON)	0.065311	0.047473	1.375746	0.1849
D(LBCON(-1))	0.091723	0.058446	1.569359	0.1331
D(LTTEL)	0.062336	0.112195	0.555606	0.5850
D(LTTEL(-1))	-0.159300	0.107199	-1.486024	0.1537
D(LTBS)	0.050078	0.056122	0.892308	0.3834
D(LTBS(-1))	-0.107054	0.074919	-1.428936	0.1693
D(LMISC)	-0.024707	0.045444	-0.543675	0.5930
D(LMISC(-1))	-0.089231	0.060580	-1.472952	0.1571
ECM1(-1)	-0.916470	0.272867	-3.358676	0.0033
R-squared	0.812613	Mean dependent var		0.217224
Adjusted R-squared	0.575914	S.D. dependent var		0.188943
S.E. of regression	0.123043	Akaike info criterion		-1.055945
Sum squared resid	0.287654	Schwarz criterion		-0.042201
Log likelihood	48.23080	F-statistic		3.433102
Durbin-Watson stat	1.975384	Prob(F-statistic)		0.004005

As regards the effect of trade openness, the reported results in both Tables 8 and 9 did not support significant influence of the current and lagged levels of oil and trade openness on growth results in the short run at 5% level of significance. The result further confirms that the country is yet to experience significant structural change in its export market. The coefficient of the lagged error correction terms, ECM1(-1) and ECM2(-1), however support the existence of long run relationship between growth and all other components of foreign private capital and trade openness in the country.

Table 9: Error Correction Modeling (ECM) for Real Economic Growth (LRGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.212579	0.128834	1.650028	0.1154
D(LRGDP(-1))	0.403727	0.204057	1.978498	0.0626
D(LGFCF)	0.069815	0.277105	0.251943	0.8038
D(LGFCF(-1))	0.083389	0.267889	0.311280	0.7590
INF	0.010186	0.004490	2.268713	0.0351
INF(-1)	-0.010029	0.004801	-2.089102	0.0504
D(OPEN4)	-0.028157	0.040606	-0.693424	0.4964
D(OPEN4(-1))	-0.026533	0.051687	-0.513335	0.6136
D(OPEN6)	-0.080831	0.126208	-0.640458	0.5295
D(OPEN6(-1))	0.070142	0.124251	0.564519	0.5790
D(LMIN)	-0.155249	0.098095	-1.582650	0.1300
D(LMIN(-1))	0.056371	0.101573	0.554982	0.5854
D(LMAN)	0.682484	0.434567	1.570492	0.1328
D(LMAN(-1))	-0.061718	0.321637	-0.191886	0.8499
D(LAGR)	0.100697	0.165451	0.608620	0.5500
D(LAGR(-1))	0.034093	0.182681	0.186626	0.8539
D(LBCON)	-0.034778	0.112625	-0.308796	0.7608
D(LBCON(-1))	-0.249212	0.141633	-1.759561	0.0946
D(LTTEL)	-0.379949	0.249198	-1.524691	0.1438
D(LTTEL(-1))	-0.474955	0.323052	-1.470214	0.1579
D(LTBS)	0.140256	0.140103	1.001089	0.3294
D(LTBS(-1))	-0.038064	0.166120	-0.229136	0.8212
D(LMISC)	-0.155872	0.097992	-1.590666	0.1282
D(LMISC(-1))	-0.191974	0.120835	-1.588721	0.1286
ECM2(-1)	-0.815572	0.206197	-3.955302	0.0008
R-squared	0.584857	Mean dependent var		0.122581
Adjusted R-squared	0.560465	S.D. dependent var		0.324208
S.E. of regression	0.314254	Akaike info criterion		0.819380
Sum squared resid	1.876351	Schwarz criterion		1.833124
Log likelihood	6.973636	F-statistic		2.115305
Durbin-Watson stat	2.181582	Prob(F-statistic)		0.108719

V. Conclusion:

The paper examined whether increased foreign private capital inflows and trade openness are necessary for accelerated growth of the Nigerian economy. These issues were carried out using Granger causality tests. The evidence clearly showed that foreign private capital inflows caused economic growth in the Granger sense and its positive long run effect could be linked to all its components except the agriculture sector of the economy. The paper suggested that increased level of foreign private capital could only bring significant positive growth if such capital inflows are made into all the sectors of the economy simultaneously.

The finding also revealed that causality runs from trade openness to foreign private capital inflows with advocacy for adequate policy at stimulating greater openness that will attract higher foreign capital inflows into the Nigerian economy. The study further confirmed the positive effect of trade openness on the economy. The significant positive impact of openness was, however, attributed to the mining (oil) sector while trade openness measure using non-oil sector impacted negative influence on the economy. The paper suggested that improvement in the economy would further enhance openness and increased foreign capital inflows. The paper therefore concluded that more openness in the area of non-oil sector would certainly bring accelerated development of the Nigerian economy.

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