FOREIGN DIRECT INVESTMENT (FDI): DETERMINANTS AND GROWTH EFFECTS IN A SMALL OPEN ECONOMY

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ABSTRACT

In an attempt to attract foreign direct investment, many African countries embarked on various reforms. Nigeria, like many African countries, took some steps towards trade reforms and macroeconomic regime and introduced measures aimed at improving the FDI regulatory framework. In the form of stocktaking, this study examines the determinants of FDI, the causal relationship among factors affecting economic growth in Nigeria, including the formal investigation of the export-led and FDI-led growth hypotheses in Nigeria for the period between 1970 and 2005. We found that Nigeria's potential market size, the degree of export orientation, human capital, providing enabling environment through the provision of infrastructural facilities, and macroeconomic stability are important determinants of FDI flows. Further, our results confirms that foreign direct investment leads to economic growth and that government consumption expenditure, openness to international trade and human capital are complementary to economic growth. Controlling for domestic investment growth as well as other factors, causality tests show support for both the export-led growth and FDI-led growth hypotheses for Nigeria.

INTRODUCTION

Foreign Direct Investment (FDI) has long been a subject of great interest in the field of international development. In an era of volatile flows of global capital, the stability of FDI and its emergence as an important source of foreign capital for developing economies has once again renewed interest in its linkages with sustainable economic growth.

Nigeria, like many developing countries, is in dire need of foreign investment to complement the domestic investment and resources. In addition, the supply side of the Nigerian economy requires a massive injection of foreign resources to generate the necessary increase in output which is required to reduce the rate of inflation, promote growth in the industrial sector and stimulate the acquisition of foreign technology which would further enhance economic growth.

However, Nigeria did not take advantage of the first FDI boom of the late 1980s, primarily because of macroeconomic instability, frequent policy reversals, restrictions on some sectors of FDI and on the reparation of profits and capital. Considerable amount of FDI flow into Nigeria began after 1986 when some of the restrictions were lifted and infrastructure sectors were opened to private participation (the 1986 adjustment program constitute a bold policy response to attract foreign investors, correct internal and external imbalance). FDI flow into Nigeria has increased rapidly since 1999 due to the privatisation of banks, energy and telecommunication sectors, and gradually improving macroeconomic policy framework. In recent years, FDI represents by far the most important source of external financing for many African countries and Nigeria in particular. In 2005, FDI represented about 35.1 percent of total net GDP in Nigeria.

A number of studies have examined the effects of FDI on growth in developing countries. Though these studies have made useful contributions towards an understanding of the role of FDI in economic growth, however, their statistical approach raises a critical methodological issue. Many of the investigations make an a priori presumption that FDI responds to or causes economic growth, and few have considered the feedback and the long run equilibrium relationship between FDI and economic growth. Investigation of the causal link between FDI and growth has important implications for development strategies.

Also, few studies that have examined the determinants of FDI, and relationship between economic growth and FDI for Nigeria were based on surveys with the exception of Dimowo and Edo (1996), and Akinlo (2004), while other studies model the relationships between FDI and growth for a broad cross section of countries. Some studies on developing countries found positive relationships between FDI and growth, conditional on various variables including initial income, financial development, trade openness, human capital development, and other proxies for host country absorptive capacity. However, findings from the various cross-sectional studies on the relationship between FDI and growth in developing countries cannot be generalized. There is need for country specific studies on the subject matter to shed more light on the debate and allow for more country specific policies.

The question, then, is whether FDI has a positive effect on the Nigerian economy, and if so, what the governments can do to attract more. Examining the motivations for direct investment in Nigeria and the extent to which FDI contributes to growth, the study seeks to shed light on appropriate policies to pursue in order to encourage higher volumes of FDI and their likely implications for economic growth. In order to avoid the pit-fall in previous studies, this paper aims to first investigate causality between FDI, exports, and economic growth and the effect of FDI on per capita gross domestic product (GDP) growth in Nigeria over the period 1970:1-2005:4. These, of course, constitute the objectives of this paper.

The paper is structured into five sections. Following the introduction, section two contains the literature review while section three focuses on the research data and methodology. In section four, we present the research findings while the last section contains the conclusion.

LITERATURE REVIEW AND BACKGROUND

This section is into two parts. The first part focuses on the trend of foreign direct investment in Nigeria while the second part deals with the empirical relationship between FDI and growth respectively.

FDI Trend in Nigeria

It is generally known that FDI flow into the less developed countries, (including Nigeria), increased substantially in the 1990s. The FDI into Nigeria during this period averaged between US$1 to US$1.5 billion, with an aggregate investment totaling US$20 billion at the end of 1999. This was half of Nigeria's GDP. In 1999, FDI to Nigeria was US$1.01 billion which was 0.2 percent of world's total of US$865 billion, 0.7 percent of developing country's total of US$ 207 billion and 15 percent of Africa's US$ 9 billion. This makes Nigeria one of the major recipients of FDI in Africa, with the Republic of South Africa, Egypt, Morocco and Tunisia, in that order. The total FDI flow into Nigeria was US$3.2 billion and US$ 3.5 billion for 2004 and 2005 respectively. Figure 1 provides a trend of annual FDI flow into Nigeria between 1980 and 2005.

A breakdown of the sources of FDI inflow to Nigeria as depicted in figure 2 revealed that the United States (US) and the United Kingdom (UK) accounted for most FDI to Nigeria. Since 1988, the US has been the most important source of FDI flows to Nigeria accounting for approximately 21.5 percent of inflows in 2005. This represents a marked-shift from the 1980-1988 period in which the inflow from both the US and the UK were about the same.

Figure 1: Flow of Foreign Direct Investment into Nigeria 1980 – 2005
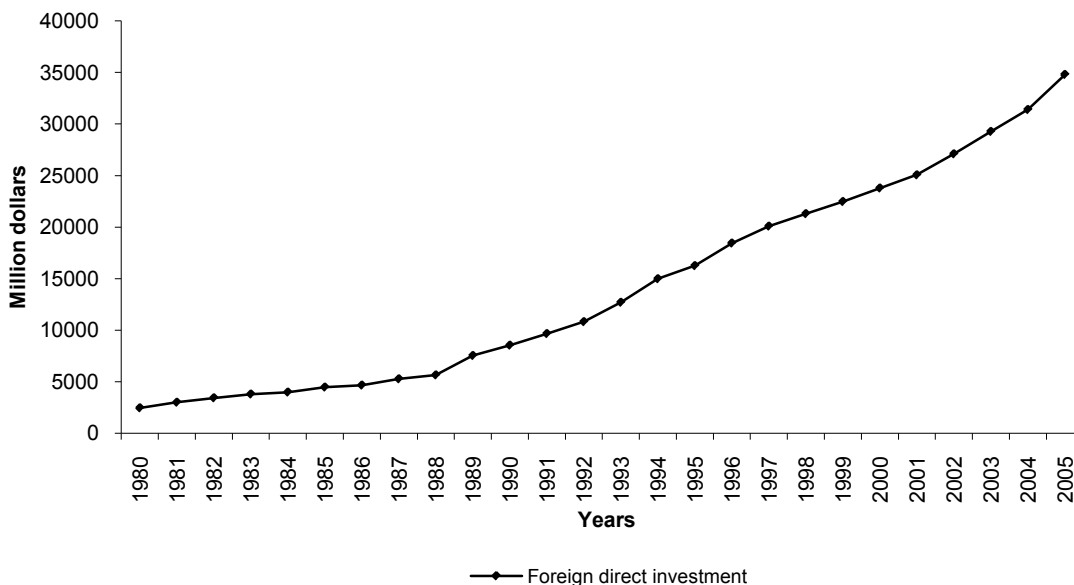
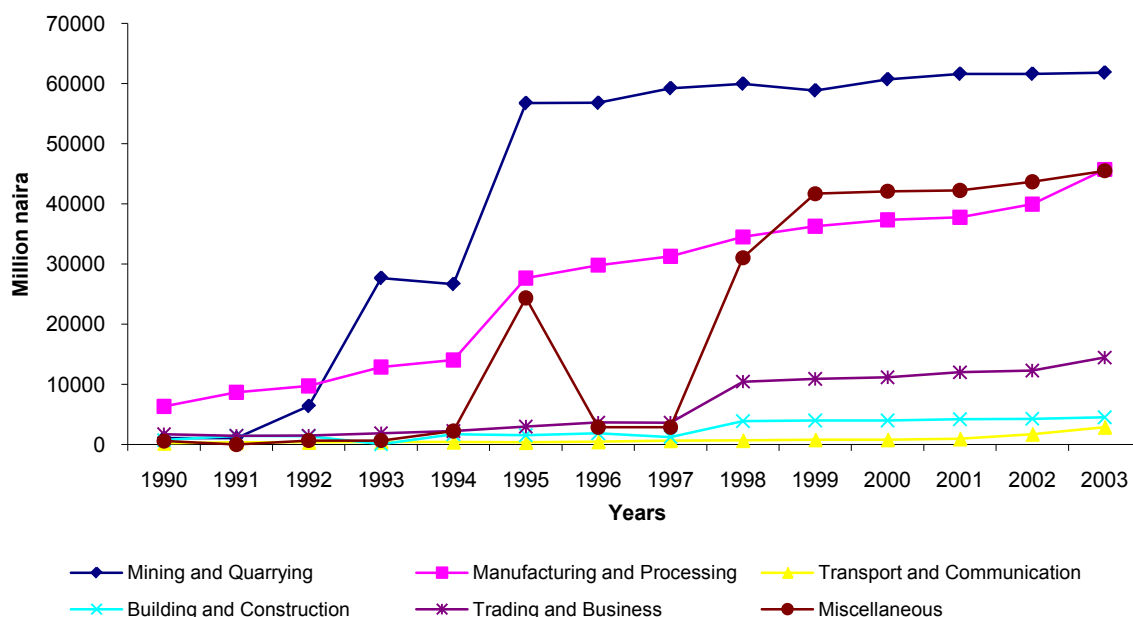*The figure shows the total inflow of FDI into the Nigerian economy between 1980 and 2005*

Figure 2: Flow of Foreign Direct Investment by Origin 1980 – 2005
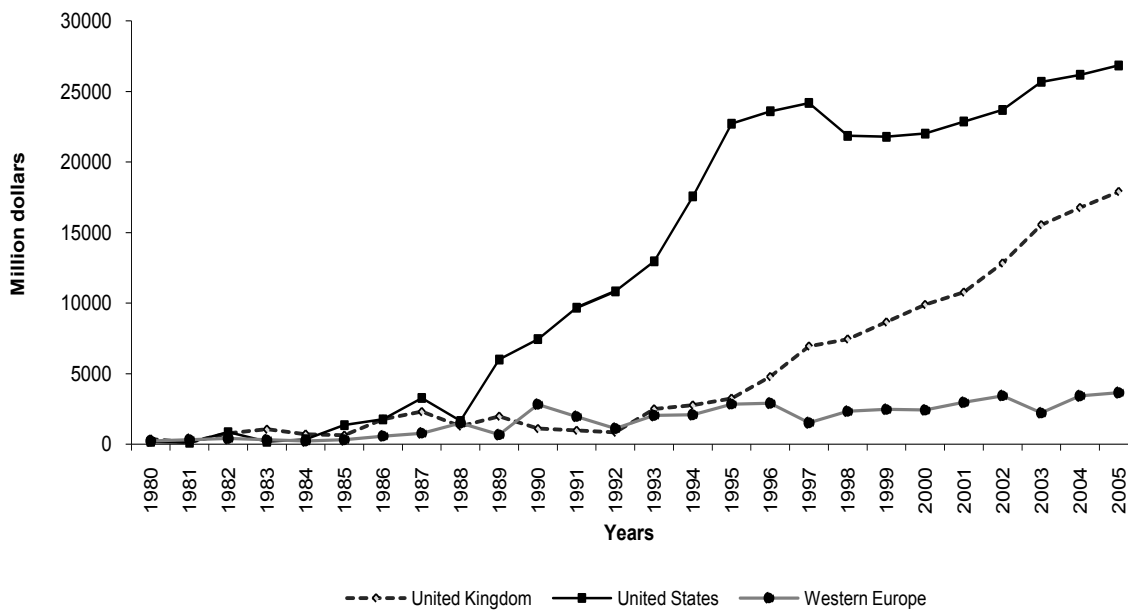
The figure revealed the flow of FDI from the United States, UK and Western Europe into Nigeria between 1980 and 2005.

As cursory observation of the FDI inflow from sectoral perspective as shown in figure 3 revealed that the primary sector remains the largest recipient of FDI flows accounting for 45 percent of inflow. Within the primary, oil and gas are the industries with the lion share. In 2003, the oil and gas sectors attracted inflows worth US $67,563 million and $67,617 million respectively. In 2005, most of the FDI to Nigeria, especially those from Europe and USA were mainly in the oil and gas sector, with an increasing percentage in the manufacturing sector.

Figure 3: Component of Foreign Direct Investment in Nigeria 1990 – 2003

This figure shows the inflow of FDI into the sectors of the Nigerian economy between 1990 and 2003

As depicted in figure 3, FDI inflow into the manufacturing sector is gradually becoming encouraging. This might not be unconnected with economic reforms in this sector and the various incentives introduced by the government since 1995 and the on-going diversification of the Nigerian economy from the oil sector to the non-oil sector.

The Empirical Relationship between FDI and Growth

There is a growing consensus that FDI is positively correlated with economic growth. Theoretically, this view has been bolstered by recent developments in growth theory, which highlight the importance of improvements in technology, efficiency and productivity in stimulating growth. The FDI increases the rate of technical progress in the host country through 'contagion' effect from more advanced technology and management practices by the foreign firms. This contagion or knowledge diffusion (often referred to as externalities or efficiency 'spill-over') can lead to improvements in productivity and efficiency in local firms; see Borensztein et al. (1998) for details. In its simplest form, a spill-over occurs when a local firm improves its productivity by copying some technology used by multinational affiliates/corporation (MNC) in the local market.

Nunnenkamp and Spatz (2002) found significant Spearman correlations between FDI flows and per capita GNP, risk factors, years of schooling, foreign trade restrictions, complementary production factors, administrative bottlenecks and cost factors. Campos and Kinoshita (2003) use panel data to analyse 25 transition economies between 1990 and 1998. Their findings revealed that FDI is influenced by economy clusters, market size, the low cost of labor, and abundant natural resources. Besides all these factors, the following variables presented significant results: sound institutions, trade openness, and lower restrictions to FDI inflows. Holland et al (2000) reviewed several studies for Eastern and Central Europe, producing evidence of the importance of market size and growth potential as determinants of FDI.

Findings by Dees (1998) revealed that FDI has been important in explaining China's economic growth, while De Mello (1996) finds a positive correlation for selected Latin American countries. A recurring

theme seems to be the need for the host country to have achieved a certain threshold of development – the absorptive capacity for the new technology. For instance, Lipsey, Blomstrom, and Zejan (1994) found that FDI has a significant positive influence on growth rates but the influence seems to be confined to higher income developing countries. The authors interpret this result as signifying that the host country must be capable of absorbing the new technology manifested in the FDI. At a more specific level, this absorptive capacity is conceived as a certain level of human capital. Tang, Selvanathan and Selvanathan (2008) explored the causal link between FDI, domestic investment and economic growth in China between 1988 and 2003 using the multivariate VAR and ECM. There results indicate that there is a bi-directional causality between domestic investment and economic growth while there is a single directional causality from FDI to domestic investment and economic growth.

With regard to Africa, most of the studies on FDI in Africa are descriptive, and are often based on surveys that seek to explore the motivation to invest in Africa (Basu and Srinivasan, 2002; Jenkins and Thomas, 2002) with very few focusing on the relationship between FDI and economic growth. Asiedu (2002) explored whether the factors that influence FDI in developing countries also influence FDI flows to SSA countries. Using cross-sectional data from 71 developing countries, she concludes that some variables that are significant for FDI flows to developing countries do not seem to be important for FDI flows to SSA. These include the rate of return on investment and better infrastructure. In a study that examined the relationship between business climate and FDI in SSA, Morisset (2000) concludes that a better business environment tends to compensate for the lack of natural resources and large domestic markets.

Balasubramayam, Salisu, and Sapsford (1996 and 1999) found tentative evidence regarding the importance of a certain threshold of the host's human capital. Their studies also found that FDI's growth contribution is significantly greater in outward-oriented or neutral trade regimes than with import substitution trade strategy. This finding reinforces the results from the pioneering study by Bhagwati (1978). A recent panel data analysis of the effects of foreign direct investment (FDI) on economic growth conducted by Lumbila (2005) using data from some African countries revealed that FDI exerts a positive impact on growth in Africa. Also, factors such as trained human capital and an attractive investment climate stemming from a developed infrastructure, lower country risk and stable macro environment in the host countries, enhance the impact of FDI on growth.

However, a dissenting view is echoed in Rodrik (1999) who argues that the effect of FDI on economic growth tends to be weak, and suggests that much if not most of the correlation between FDI and superior economic performance is driven by reverse causality: MNCs tend to locate in the more productive, fast growing, and profitable economies. Rodrik cites a Bosworth and Collins (1999) study on total capital flows, that does not find the 'crowding –in' effect of Borenzstein, De Gregorio and Lee (1995) – instead Bosworth and Collins (1999) find that the positive effect of FDI on domestic fixed investment tends to fall off significantly when more country characteristics are controlled for. That result notwithstanding, Bosworth and Collins (1999) also find that FDI inflows tend to raise a country's economic growth rate through their positive impact on total factor productivity.

DATA AND METHODOLOGY

We use time series data from 1970:1 to 2005:4 to estimate all equations. The data were compiled from various volumes of the Central Bank of Nigeria publications i.e. Statistical Bulletin, Economic and Financial review; International Financial Statistics, a publication of the International Monetary Funds (IMF) and the World Bank Economic Indicators (see appendix for details). In examining the determinants of FDI, the general form of the model estimated is:

$$FDI = \alpha + \beta_1 \Delta RGDPG + \beta_2 \Delta RGDPC + \beta_3 \Delta EXP + \beta_4 \Delta INF + \beta_5 \Delta ILLIT +$$
$$\beta_6 \Delta GFCF + \beta_7 \Delta TELE + \beta_8 \Delta LIB + \varepsilon \qquad\qquad 1$$

where the upper case denotes natural logarithms, RGDPG represents growth rate of real GDP, RGDPC is the real GDP per capita, EXP represents exports as a percentage of GDP (measures of openness), INF denotes annual rate of inflation based on consumer price index, ILLIT is the rate of adult illiteracy, GFCF represents the gross fixed capital formation (as percentage of GDP), TELE is the telephone lines per 1000 people, LIB represents a measure of liberalisation (dummy variable), Δ is the difference operator, and ε is uncorrelated error terms. Next, the relationship between FDI and economic growth is examined by employing a mode which is a variant of the one developed by the Transnational Corporation and Management Division of the United Nations Department of Economic Social Development, see UN (1992). Its structure (which assumes a linear function) is:

$$Gr = \phi + \varphi_1 \Delta L + \varphi_2 \Delta K_p + \varphi_3 \Delta K_f + \varphi_4 \Delta H + \varphi_5 \Delta EXP + \varphi_6 \Delta C_g + \varphi_7 \Delta B_g$$
$$+ \varphi_8 \Delta F_n + \varphi_9 D + \varphi_{10} T + \mu \qquad\qquad 2$$

In equation 2, Gr is the real GDP, L is the labor, K_p and K_f are stock of private and foreign capital respectively; Cg is the real government consumption, EXP is the real export, H is human capital proxied by the share of students in the university, polytechnics and colleges of education in the population, D is the adjustment dummy, 1 for adjustment period 1986 to 2005 and 0 otherwise, F_n stands for financial depth measure as ratio of money supply broadly defined to GDP, B_g is budget balance over GDP. T is the time trend to capture secular trend in output during the period of study. While equation (2) captures the impact of important variables on GDP growth, it does not account for the possibility of a bi-directional relationship between growth and FDI highlighted in the literature. To capture these possible temporal causality relationships, the technique of Granger causality can be employed. The test involves estimating the following regressions:

$$Gr_t = a_0 + \sum_{j=1}^{p} a_j Gr_{t-j} + \sum_{j=1}^{p} b_j K_{f,t-j} + \mu_t \qquad\qquad 3$$

$$K_{ft} = m_0 + \sum_{j=1}^{p} m_j K_{f,t-j} + \sum_{j=1}^{p} e_j Gr_{t-j} + v_t \qquad\qquad 4$$

$$Gr_t = z_0 + \sum_{j=1}^{p} z_j Gr_{t-j} + \sum_{j=1}^{p} \eta_j EXP_{t-j} + \mu_{1t} \qquad\qquad 5$$

$$EXP_t = r_0 + \sum_{j=1}^{p} r_j EXP_{t-j} + \sum_{j=1}^{p} s_j Gr_{t-j} + \omega_t \qquad\qquad 6$$

where Gr_t, K_{ft} and EXP_t are stationary time series, μ_t, v_t, ω_t and μ_{1t} are uncorrelated error terms and p is the lag order selection. However, if there exist co-integration between FDI and GDP, and exports and GDP, the appropriate format is to investigate the long run causality in the error correction model (ECM). By equation (3), K_f (FDI) Granger causes Gr (GDP) if $b_j \neq 0$. Also, equation (4) shows that Gr Granger cause K_f if $e_j \neq 0$. From equation (5) EXP (exports) Granger causes Gr (GDP) if $\eta_j \neq 0$, while in equation (6) Gr (GDP) Granger causes EXP (exports) if $s_j \neq 0$. Bi-directional Granger causality is obtained if $b_j \neq 0$, $e_j \neq 0$, $\eta_j \neq 0$ and $s_j \neq 0$.

EMPIRICAL RESULTS

Our data is tested for unit root using the Augmented Dickey Fuller (ADF), and Phillips-Perron tests with a constant and deterministic trend. The results of the ADF tests are presented in Table 1 below.

Table 1: Nigeria- Tests for Stationarity with Constant and Time Trend, Sample 1970-2005

Variables	Levels	First Difference	Critical Value (5%)	Critical Value (1%)
INF	-2.21	-4.93*	-3.55	-4.77
EXP	-2.08	-4.52*	-3.55	-4.77
GDP	-1.22	-4.54*	-3.55	-4.77
RGDPC	-2.73	-6.23*	-3.55	-4.77
GFCF	-3.06	-4.06**	-3.55	-4.77
TELE	-2.11	-7.23*	-3.55	-4.77
KP	-1.46	-4.54*	-3.55	-4.77
KF	-1.87	-7.48*	-3.55	-4.77
ILLIT	-2.25	-5.74*	-3.55	-4.77
L	-3.15	-8.74*	-3.55	-4.77
CG	-2.78	-5.89*	-3.55	-4.77
GR	-1.49	-6.78*	-3.55	-4.77
H	-1.59	-4.73*	-3.55	-4.77
BG	-2.60	-3.56**	-3.55	-4.77
FN	-1.52	-6.83*	-3.55	-4.77

*This table summarises the Augmented Dickey Fuller (ADF) tests results. It shows that all the variables are not stationary at levels except gross fixed capital formation, (GFCF). However, stationarity is achieved through first difference. Similar results were obtained when we employed Philip-Perron approach.Notes: Mackinnon (1996) critical values for rejection of hypothesis of a unit root * Denotes significance at 1% level; ** Denotes significance at 5% level*

Our results in Table 1 revealed that all the variables are integrated of order one $I(1)$ with the exception of GFCF which is $I(0)$. Therefore, having established that our variables are stationary, we used the Johansen-Juselius (1990) technique to test for co-integration.

Table 2: Cointegration Results (with a Linear Trend)

Null	Alternative r	λ max	Critical Value (95%)	Trace	Critical Value (95%)
Panel (A): Estimates of λ max and trace tests					
0	1	34.70*	27.07	61.67*	47.21
≤1	2	14.51	20.97	26.97	29.68
≤2	3	8.70	14.07	12.45	15.41
≤3	4	3.70	3.76	3.70	3.76
Panel (B): Estimates of co-integrating vector					
G_r	L	H	K_p	Kf	
1.000	0.601(4.22)	-0.211(-8.32)	0.119(2.18)	-0.217(-6.55)	

The table reports the long run relationship among the variables. Panel A of this table reports both the trace and maximum eigenvalue statistics for the co-integration tests using Johansen techniques while panel B revealed the estimates of the cointegrating vector.

The results in Panel A of Table 2 reports both the trace and maximum eigenvalue statistics for co-integration tests. The null hypothesis of no co-integration can be rejected using λ-max or the trace statistics. They are both greater than their critical values at 5% level of significance. This implies that there exists a unique co-integrating vector among the variables involved. The co-integrating equation normalised on the growth variable as reported in panel B of Table 2 showed that labor and private capital have a negative sign while foreign capital and human capital are positive (The signs are reversed because of the normalization process) and their coefficients are all significant as shown by the t –ratio (see, parentheses). Since the existence of co-integration among these variables is confirmed, the next step is to test the causal relationships among FDI flows, openness through trade, and GDP growth. The literature offers different statistical methods to determine the optimal lags in Granger causality tests. The Schwarz and Bayesian Criterion (SBC) and the Akaike Information Criterion (AIC) are used to determine the optimal lag lengths in the ARDL and error correction models (Hsiao, 1981). The causal directions are

detected by F - statistics and the signs of the causal effects are determined by adding the coefficients on lagged independent variables (Ram, 1988).

We first test if K_f (FDI) Granger causes y (GDP) by estimating the unrestricted equation (3), and restricted equation (3) by dropping lagged K_f. The F statistic yields a value of 8.197 which exceeds the critical values of $F_{0.01} = 5.53$. Thus, we can reject the null hypothesis $(b_j = 0)$ and conclude that adding lagged values of K_f does improve the statistical results. This implies that FDI Granger causes GDP growth, thus providing evidence for FDI-led growth hypothesis. In other words, the GDP growth rate improves with the inclusion of past changes in FDI. The same procedure was carried out for equations (4), (5), and (6). The results from equation (4) indicate that GDP growth does not Granger cause FDI in Nigeria (F statistic 4.29, below the critical value of $F_{0.01} = 5.53$) which implies a unidirectional relationship between GDP and FDI.

Our results from equations (5) and (6) suggest that exports Granger cause GDP growth, but GDP growth does not Granger cause export. The former results provide evidence that exports play a relevant role in explaining economic expansion and also support the export-led hypothesis. These results suggest that liberalization in Nigeria has had a significant impact on the economy thanks to higher levels of exports due to a more flexible trade policy. Further, our results revealed that exports Granger cause FDI (F statistic 7.92, is higher than the critical value of $F_{0.01} = 5.53$), however, FDI does not Granger cause exports.

Table 3 reports the estimated regressions results on the determinants of FDI. From the table, the inflation variable is significant and has the expected sign. This implies that macroeconomic stability is an important determinant of FDI inflow to Nigeria. We can infer from our results that liberalisation of the Nigerian economy has encouraged FDI inflows and thus support the proposition that foreign investors are more likely to invest in countries that have opened up their economy.

Also, the estimated coefficient of the market size variable (RGDPC) has the expected positive sign and was significant. This implies that the level of per capita income has implications on market seeking FDI to Nigeria. Other things being equal, an increasing level of per capita income would enhance the inflow of FDI. A similar market variable, the growth rate of real GDP that measures the growth prospects of the economy, has positive and significant coefficients in three of the four regressions. This finding further confirms the hypothesis that a growing economy attracts more FDI. An important finding is the positive and significant effect of export orientation (.i.e. openness). This finding suggests that FDI in Nigeria is of the vertical type which is normally export oriented and tends to be unaffected by the market size of the host economy.

The degree of export orientation of the economy is more germane than market size to foreign investors who tend to locate in the export sector. The main export items in Nigeria come from the primary sector .i.e. mining, agriculture and services sectors which account for more than half of approved FDI projects. Although it has been argued that political instability in the host country could discourage the inflow of FDI, and most of the empirical studies supported this argument, however, some empirical evidence suggested that political factors played an insignificant role in firms' decision to invest abroad (see Swain and Wang, 1997 and Zhang, 2002).

The human capital variable which is measured by the rate of adult illiteracy is statistically significant and has the right sign suggesting that an economy with high fraction of unskilled workers is likely to be much less productive and less attractive to foreign investors. As expected, given the recent huge spending by

the government on infrastructural facilities in Nigeria and reforms in the telecommunication sector, it coefficient is positive and significant.   This confirms the hypothesis that the development of telecommunication (.i.e. infrastructure) has positive impact in attracting FDI in Nigeria.

Table 3: Results of OLS Estimation, Dependent variable: FDI Inflows (Percent of GDP)

Independent variables	3.1	3.2	3.3	3.4
Constant	-0.510(0.112)**	-0.642(0.017)**	-0.778(0.015)**	-0.801(0.009)**
RGDP growth	0.540(0.011)**	0.644(0.009)**	0.718(0.006)**	0.849(0.003)**
RGDP per capita	1.711(0.615)**			
Export	2.176(0.008)**	3.244(0.002)**	3.142(0.004)**	2.277 (0.007)**
Inflation	-0.581(0.031)**	-0.592(0.029)**	-0.601(0.020)**	-0.599(0.026)**
Lib Dummy	1.225(0.027)**	2.484(0.012)**	2.180(0.017)**	1.871(0.024)**
Illiteracy			-1.521 (0.623)**	
Telephone				-3.481(0.057)*
GFCF				-6.577(0.214)*
Adjusted R^2	0.62	0.64	0.61	0.60
LM-SC[1]	0.0358(0.742)	0.714(0.679)	0.061(0.802)	0.521(0.511)
LM-FF[2]	0.224(0.544)	0.278(0.674)	0.284(0.594)	0.266(0.576)

*Figures in parenthesis denote p – values, ** significant at 5 percent, and * significant at 10 percent. 1: LM-SC denotes the lagrange multiplier test for residual serial correlation. The null hypothesis for the test is that there is no serial correlation and the test statistic is distributed as χ^2 with 1 degree of freedom. The 95 percent and 90 percent critical values for χ^2 are 3.72 and 2.81 respectively. 2: LM-FF denotes Ramsey's RESET test of functional form. The null hypothesis for the test is that the regression model is specified correctly. The 95 percent and 90 percent critical values for χ^2 at 1 degree of freedom are 3.72 and 2.81 respectively.*

Having established that our variables are co-integrated, we use the information obtained from L.R tests to generate error correction models (ECM) that capture the short and long run behaviours of the output relationship. The coefficient of the ECM (i.e. ECM_{t-1}) denotes the speed of adjustment back to the long run relationship among variables while changes in relevant variables represent short run elasticities. The results of the vector error correction are subjected to a number of diagnostic checks, including stability, within equation residual serial correlation, heteroscedasticity and normaility tests. In Table 4, we provide the results for output growth relationship in Nigeria for the period 1970 – 2005. The main results indicated that the correlation between growth and FDI is positive. The positive and statistically significant effect of government consumption expenditure contradicts the crowding-out effect predicted by the neoclassical growth model. This is an indication that the government continues to play an important role in the development process. Indeed, part of the government spending was used to build infrastructure and institutions to attract foreign investment.

The coefficient of financial development (F_n) measures the level of financial development in Nigeria and has negative implications for the growth-FDI relationship. Our results showed that the relationship between financial development and growth within the period under investigation is negative. This result could imply that the liberalised domestic market and the deregulated international financial markets encouraged capital flight abroad where risk-adjustment returns are higher. From Table 4, labor and human capital are positive and statistically significant in all versions of the growth regressions. This might be expected given the on going reforms in Nigeria. In fact, this does not only confirm the important role of labor in a growing economy, it is also likely that the level of efficiency with which the stock of technical knowledge is translated into technologies in the market via the higher education system has continued to improve. The higher institutions witnessed increased enrolments during the period under investigation.

Table 4: Nigeria: Error Correction Model (Dependent Variable $\Delta \ln Gr_t$)

Variables	4.1	4.2	4.3	4.4	4.5	4.6
Constant	0.19(2.03)	0.17(2.26)	0.21(4.13)	0.24(2.99)	0.18(2.06)	0.26(3.71)
$\Delta \ln L_t$	0.14(3.11)	0.16(2.02)	0.11(2.12)	0.12(1.97)	0.17(2.08)	0.24(2.73)
$\Delta \ln H_t$	0.04(2.74)	0.06(3.07)	0.08(2.09)	0.09(3.10)	0.07(2.47)	0.05(3.07)
$\Delta \ln K_p$	0.20(1.72)	0.18(1.89)	0.17(1.91)	0.14(1.99)		
$\Delta \ln K_f$	0.22(2.22)	0.24(4.01)	0.23(1.97)	0.25(4.18)	0.23(2.40)	0.28(3.23)
$\Delta \ln EXP$	0.19(1.98)	0.17(3.23)	0.20(3.24)		0.23(4.10)	0.13(3.19)
$\Delta \ln C_{gt}$				0.19(2.48)	0.27(3.14)	0.26(3.54)
$\Delta \ln F_n$	-0.015(1.96)	-0.091(1.89)		-0.051(3.79)	-0.042(2.31)	-0.15(3.54)
D	0.006(1.98)		0.004(2.01)	0.006(2.56)	0.007(2.81)	0.004(2.2)
ΔB_g			0.07(3.89)	0.05(3.90)	0.03(1.99)	0.04(3.44)
T	0.002(2.88)	0.004(2.02)		0.003(1.98)	0.005(2.31)	0.002(3.3)
ECM_{t-1}	-0.13(-2.44)	-0.17(-3.23)	-0.16(-2.91)	-0.21(-6.11)	-0.11(-2.77)	-0.22(-3.4)
R^{-2}	0.83	0.75	0.69	0.71	0.76	0.74
S.E	0.007	0.006	0.009	0.008	0.006	0.0008
D.W	2.02	1.98	2.06	2.01	2.05	2.04
AR (1)	0.32	0.35	0.33	0.39	0.38	0.37

This table provides a summary of the estimates of the adjustment to the long run equilibrium relationship. The result shows that the ECM terms, representing the speed of adjustment to long run equilibrium, are negative and significant. The correlation between growth and FDI; growth and human capital are positive while the relationship between financial development and growth is negative.

Previous studies (Barro 1991) found a positive and significant effect of the higher education enrolment rate, when used as a proxy for human capital. Moreover, the positive but not statistically significant effect of domestic investment might not be unconnected to the relatively small nature of private investment in the economy. This attests to the domineering effect of the government in the Nigerian economy for many years. So also, the budget balance over GDP has a positive and significant effect on growth which implies that a reduction in the budget deficit would likely facilitate the private sector's access to bank credit and thus stimulate economic activity. The growth rate of real export has a significant positive effect on growth, see Edwards (1992). The time trend has significant positive effect within the period under consideration. The measure of liberalization has positive and significant effect. This could imply that the likely enabling environment that comes with a liberalized economy would, other things being equal, attract foreign investors.

The ECM terms are negative and significant in all equations and the relative fit and efficiency of the regressions conforms to theoretical predictions. The ECM coefficient in equations 4.1 to 4.6 has the right sign and is highly significant. The regression results from equation 4.6 revealed that deviations from long run growth in this period are corrected by 22 percent in the following year.

CONCLUDING COMMENTS

The links between FDI and growth has been examined for the Nigerian economy. The paper focused on the determinants of FDI, the causal relationships among factors affecting economic growth in Nigeria, including the formal investigation of the export-led and FDI-led growth hypotheses, for the period between 1970 and 2005. We found that Nigeria's potential market size, the degree of export orientation, human capital, providing enabling environment through the provision of infrastructural facilities, and macroeconomic stability are all important determinants of FDI flows. We observed that foreign firms do not simply come to Nigeria to take advantage of any single location factor, but are more importantly driven by a whole myriad of often conflicting and competing reasons.

By and large, our results revealed that foreign direct investment leads to economic growth in Nigeria and that domestic investment, openness to international trade and human capital are complementary to

economic growth. In fact, economic growth has been driven largely by human capital development, growth of exports, FDI and government consumption expenditure, as would be expected. Controlling for domestic investment growth as well as other factors, causality tests also show support for both the export-led growth and FDI-led growth hypotheses.

The significant positive effect of liberalization on FDI indicates that an enabling environment that comes with a liberalized economy is likely to attract foreign investors. The policy implication of this for Nigeria is that to induce FDI, the Nigerian government needs to focus on improving the investment climate through measures of liberalization as well as creating an efficient bureaucracy that facilitates the entry and speedy operation of foreign investors. Also, the positive and significant effect of economic growth on FDI emphasizes the crucial role of economic growth in stimulating investment by foreign as well as domestic investors. In conclusion, given the positive FDI growth impact in Nigeria, improving growth rates signal a country's economic growth prospects and encourage foreign investors. Thus, keeping up the growth momentum and ascertaining its sustainability is a key to attracting more FDI. As data become available, study that examines impact of FDI on various sectors of the Nigerian economy will complement this research.

APPENDIX

Variable	Definition of the variable	Proxy
$RGDPG$	growth rate of real GDP	percentage change in real GDP was used as a proxy for growth in output.
$RGDPC$	Real GDP per capita	the real GDP divided by population
EXP	exports	Exports as a percentage of GDP (measures of openness. Export goods without crude oil (flows). It was deflated by an export price index, 1993=100
INF	Rate of inflation	The rate of inflation
$ILLIT$	Rate of illiteracy	Below primary educational attainment
$GFCF$	Gross fixed capital formation	The gross fixed capital formation as a percent of GDP
$TELE$	Telephone	Telephone lines per 1000 people
LIB	Government Policy	Measure of liberalization policy of the government (dummy variable)
K_f	Stock of foreign direct investment	The series was deflated by an implicit price index. The stock of FDI was obtained through the perpetual inventory model of the form: $K_t = K_{t-1} + I_t - \delta K_{t-1}$ where K_{t-1} is the stock of capital at time $t-1$. I_t is the flow of gross investment during period t and δ is the rate at which private and foreign capital depreciates in period $t-1$. In this research, an initial stock of 8 years and 5% depreciation were considered in the calculations.
K_p	Stock of private capital	The series was deflated by an implicit price index.
H	Human capital	Students enrolled in secondary school. Series was interpolated from annual to quarterly data
L	Labor	Remunerated workers (economically active labor force). The series was interpolated from annual to quarterly data.
C_g	Government consumption	The original series was in real terms; it was converted to US dollars and was seasonally adjusted
F_n	Financial depth	This series is a ratio between broad money taken as M1 divided by GDP. The series were in current prices
B_g	Budget balance	This series is the ratio between budget balance divided by GDP. Both series were taken in real terms
T	Time Trend	1970-2005

The choice of independent variables is constrained by data availability, as is mostly the case with time-series data in developing countries. For example, time-series data on some of the determinants such as tariff rates, trade taxes, real wages, and corruption index that are used in some studies of this nature are not readily available for Nigeria over the period of the study.

REFERENCES

Akinlo, A.E (2004) "Foreign direct investment and growth in Nigeria An empirical Investigation," *Journal of Policy Modeling* 26:627-39

Asiedu, E (2002) On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different? *World Development*, Vol. 30, pp107-119

Balasubramayam, V., M. Salisu and Sapsford, D (1996) Foreign Direct Investment and Growth in EP and IS countries. *Economic Journal*, Vol.106, No.92-105

Balasubramayam, V., M. Salisu and Sapsford D. (1999) Foreign Direct Investment as an Engine of Growth, *Journal of International Trade and Economic Development*, Vol. 8, No. 1, pp 27-40.

Banerjee, A., J. Dolado, J.W. Galbraith, and D. F. Hendry (1993): *Co-integration, Error-Correction, and the Econometric Analysis of Non-Stationary Data*; Oxford University Press

Basu, A and K. Srinivasan (2002) Foreign Direct Investment in Africa- Some Case Studies, IMF *Working Paper* No WP/61. Washington, DC.

Bhagwati (1978) *Anatomy and Consequences of Exchange Control Regimes*, Vol. 1, *Studies in International Economic Relations*, 10 (New York: National Bureau of Economic Research)

Blomstrom, M., Lipsey, R., Zejan, M., (1992) *What explains Developing Country Growth*, NBER Working Paper No. 4132

Borenzstein, E., De Gregorio, J. and J-W Lee (1995) 'How Does Foreign Direct Investment affects Economic Growth?' *NBER Working Paper, No 5057*

Borenzstein, E., De Gregorio, J. and J-W Lee (1998) 'How Does Foreign Direct Investment affects Economic Growth?' *Journal of International Economics*, 45, 115-135.

Bosworth, B. and Collins, S (1999) Capital Flows to Developing Economies:Implications for Saving and Investment, *Brookings Paper on Economic Activity*, 1

Carkovic, M., Levine, R., (2000) *Does Foreign Direct Investment accelerate Economic Growth?* University of Minnesota, *Working Paper*

Campos, Naura F. and Yuko Kinoshita (2003) 'Foreign Direct Investment as Technology Transferred: Some Panel Evidence from the Transition Economies', William *Davidson Working Paper Number* 48

De Mello (1996) Foreign Direct Investment, International Knowledge Transfer, and Endogenous Growth: Time Series Evidence. *Department of Economics*, University of Kent, *mimeo*

De Mello (1999) Foreign Direct Investment, and Endogenous Growth: Evidence from Time Series and Panel Data, Department of Economics, University of Kent, *Mimeo*

Dees, S (1998) Foreign Direct Investment in China: Determinants and Effects", *Economics of Planning*, 31(2/3), 175-194.

Dimowo, F. A and Edo, S. (1996) The Impact of Direct Foreign Investment on the Economy of Nigeria, *Indian Journal of Economics*, Vol. 52, No 4

Edwards S. (1992) "Openness, Trade Liberalization and Growth in Developing Countries", *Journal of Economic Literature,* XXXI

Holland, Dawn; M. Sass; V. Benacek and M. Gronicki (2003) The Determinants and Impact of FDI in Central and Eastern Europe: A comparison of Survey and Econometric Evidence, Transnational *Corporations*, Vol.9, N0 3

Lipsey, R., Blomstrom K. and M. Zejan (1994) What Explains Developing Country Growth?" in William Baumol, Richard Nelson and Edward Wolff, eds*., Convergence and Productivity: Cross-National Studies and Historical Evidence*, Oxford: Oxford University Press.

Lipsey, R (2000) Inward FDI and Economic Growth in Developing Countries, Transnational *Corporations*, Vol. 9, N0.1

Lumbila, Kevin N (2005) What Makes FDI Work? A Panel Analysis of the Growth Effect of FDI in Africa, World Bank, *Africa Region Working Paper Series* No.80

Morisset, P (2000) Foreign Direct Investment to Africa: Policies also Matter. *Transnational Corporation*, Vol. 9, pp 107-125

Nunnenkamp, P. and Spatz, V. (2002) Foreign Direct Investment in Developing Countries: What Policymakers should not do and What Economists don't know. Kiel Institute for World Economics, *Discussion Papers* 380, Kiel

Onyeiwu, S and H. Shrestha (2004) Determinants of Foreign Direct Investment in Africa, *Journal of Developing Societies*, Vol. 20, No. 1-2

Rodrik (1999) 'Globalization and Labor, or if Globalization is a bowl of cherries, why are so many glum faces around the table', in Baldwin, Cohen, Sapir and Venables (eds), *Market Integration, Regionalism and the Gobal Economy*. Cambridge: Cambridge University

Solow, R.M.(1956), "A contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, 65-94

Soto, M (2000) Capital Flows and Growth in Developing Countries: Recent Empirical Evidence. *OECD Development Centre*. Technical papers, 160

Tang, S., E.A. Selvanathan and S. Selvanathan (2008) Foreign Direct Investment, Domestic Investment and Economic Growth in China. *UNU-WIDER Research Paper* No. 2008/19

United Nations, (2002), "World Investment Report 2002, Transnational Corporations and Export Competitiveness", UNCTAD

UNCTAD (2005) *Africa Economic Development*., New York, United Nations

Wang, J., Y. (1990), "Growth Technology Transfer and the Long-run Theory of International Capital movements", *Journal of International Economics*, 29, pp 255-71

World Bank (1987) *Adjustment in Africa: Reforms, Results and the Road Ahead*, Washington, DC

World Bank (2000 - 2005) *World Development Indicators*, Washington, DC

Zhang and Yuk (2000) Determinants of Hong Kong Manufacturing Investment in China: A Survey. *Marketing, Intelligence and Planning, 16 (4), p 260-267*.

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