



INVESTIGATING THE INTERACTION BETWEEN FOREIGN DIRECT INVESTMENT AND HUMAN CAPITAL ON GROWTH: EVIDENCE FROM NIGERIA

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ABSTRACT

The objectives of this study is to empirically examine the relationship between FDI, HCD and Economic growth in Nigeria and to ascertain the long run sustainability of FDI- induced growth process..Our result show that FDI in Nigeria, has a negatively significant to growth in the long run, meaning that the contribution of FDI in to Nigeria are small in the long run. The negative significant effects of human capital in Nigeria, with overall growth in the long run, suggest that there is shortage of skilled labour in the country. The ECM coefficient is -0.13 and its not significant, meaning that the speed to adjust towards equilibrium is not in moderate condition. The R² (0.9930) and adjusted R² (0.9816) is very high and this fulfill the condition of goodness of fit. The F-statistics 86.9792(0.0000) is highly significant at 1% critical level, this show that there is significant relationship between the dependent variable and independent variables. The Normality test show that the residual is normally distributed (Jaqua-Bera statistics = 0.4755(0.7884).We recommend that appropriate policy should be made to improve on the development of human capital in other to benefit more from the presence of foreign investors in to Nigeria.

Keywords: Human capital, Foreign direct investment.

INTRODUCTION

The importance of technical progress was recognized in the neoclassical growth models ([Solow, 1956](#)) but the determinants of the level of technology were not discussed in detail and technology was seen as an exogenous factor. Yet, it was clear that convergence in per capita income could not occur unless technologies converged as well ([Blomstrom and Kokko, 2002](#)). Unlike the period of Solow, the growth research has increasingly focused on the understanding and endogenising

technical progress .Modern growth theory is largely built on model with constant or increasing return to reproducible factors as a result of the accumulation of knowledge (Blomstrom and Kokko, 2002).

Technological progress and growth can as well be based on the creation of entirely new knowledge or on the adaption and transfer of existing technology. Developing countries have the potential to grow faster than developed economies for any given level of investment or R & D spending. However this potential for convergence is conditional on the economy's level of human capital (Bloomstrom and Kokko 2002). Van den and Berg (2001) in Bloomstrom and Kokko (2002) noted that it is the quality of the labour force, its accumulated experience and human capital, its education system and so on that determines an economy's ability to create new ideas and adapt old ones, consequently improvements in education and human capital are essential for absorbing and adapting foreign technology, and to generate sustainable long-run growth.

FDI is seen as the most important vehicle for international technological transfer. MNCs strive to benefit from the most advanced technology available in the industry and their great resources can help them keep their position in the market by investing in research and development.

Findlay (1978) postulates that FDI increases the rate of technical progress in the host country through a contagion effect from the more advanced technology management practices used by the foreign firms. Also Wang (1990) incorporated the idea into a model more in line with the neoclassical growth framework by assuming that the increase in knowledge applied to production is determined as a function of FDI. The manifestation of FDI influences the distribution of incomes partly because they demand different types of labour and pay higher wages than local firms. Economic theory postulates that some FDI is attracted to countries that are abundant in unskilled labour relative to other countries; other FDI is attracted by natural resources endowments or policy factors. However, the foreign firms may still employ labour that is relatively skilled by local standard (Onwuka, 2001).

However the accumulation of human capital and availability of physical and financial capitals are among the major determinants of economic growth, and the lack of these resources (along with the inability to expand them). Are potential reasons behind the delay of many poor countries in achieving development?. In other words improvement in human capital and education are essential for absorbing and adapting foreign technology and to generate sustainable longrun growth. The relationship between FDI and human capital is highly non-linear, and multiple equilibrium are possible for instance, host economics with relatively high level of human capital may be able to attract a large amount of technology intensive FDI that contributes significantly to the further development of labour.

For most African countries whose economics are recovering from a long stagnation after the implementation of macroeconomics reform program, FDI inflows is much needed to accelerate growth rates to around eight or nine percent to be able to move the majority of their people out of poverty. Though many sub-Saharan African has taken steps to liberalize their environment for FDI, also there had been some polices actively designed to attract investment such as tax holidays, easing of import and customs controls, infrastructure investment and labour law reform. In fact one of the pillars on which the New Partnership for Africans Development (NEPAD) was launched to increase available capital to US\$64 billion through a combination of reforms resources mobilization and conductive environment for FDI ([Funke and Nsouli, 2003](#)), yet the fraction received is less than half percent of total FDI inflow to developing countries in these years. In Nigeria most FDI was concentrated in the extractive industry. In other words, it could be put that most works assessed the impact of investment in extractive industry (oil and natural resources) in Nigeria economic growth. [Odozi \(1995\)](#) notes that foreign investment in Nigeria was made up of mostly ‘Green field’ investment, that is , it is mostly utilized for the establishment of new enterprises and some through the existing enterprises.

Therefore following the work of [Borensztein et al. \(1998\)](#) who examine the role of FDI in the process of technology diffusion and economic growth in developing countries. They find out that FDI has a positive effect on economic growth, but that the magnitude of the effect depends on the amount of human capital available in the host country. We will examine the relationship between FDI, human capital and economic growth and also to evaluate the importance of human capital to FDI as an engine for growth in Nigeria using an endogenous model and a co-integration techniques. This work covers the period of 1975-2008. A time series analysis will be used for the empirical work. The remaining of this paper is organized as follows. Section two is the brief review of literature on foreign direct investment, human capital and economic growth. The section three is the framework for the analysis, which provides the methodology used, the variables and the estimation techniques. Section four is the discussion of result and finally the implications and conclusion was discussed

BRIEF REVIEW OF LITERATURE

Foreign Direct Investment, Human Capital Development and Economic Growth

The literature on FDI can be traced to Dunning when he came up with the famous “OLI paradigm” (Ownership-Location-Internationalization), ([Dunning, 1988](#)). He pointed out that it must fulfill 3 conditions to be considered as multinational enterprises. Firstly, it must have ownership advantage which will make it profitable for the firm to relocate abroad its owned production. Secondly, there must be location advantage and then thirdly, it must have the opportunity to conveniently manage the advantages of the firm internally. This paradigm was very useful to development economists in putting together different features of firm’s opportunities to become multinational and also

assessing the phenomenon. Investment development path (IDP) was later developed by Dunning (1992). One of the underlying principal of the IDP is that the economic development of a country in terms of its net inward and outward investment depends on the relative competitive strengths of the domestic firms vis-a-vis MNEs in ownership and location specific advantages and their abilities to internalize cross border market transactions. This theories would, thus help to ascertain some of the determinants of FDI inflows into developing countries and serve as a guide to the type of policies that should be developed by policy makers to attract specific kinds of FDI.

In the new growth literature, the importance of technological change for economic growth has been emphasized (Grossman and Helpman, 1991; Barro and Sala-i-Martin, 1995). The growth rate of the less developed countries is perceived to be lightly dependent on the extent to which these countries can adopt and implement new technology available in developed countries. The characteristics together determine absorptive capacity of technology spillovers of the host country. In order words, FDI can only contribute to economic growth through spillover when there is a sufficient absorptive capacity in the host country and also through FDI and foreign trade flow and other externalities vis-avis the host country business sector and the direct impact on structural factor in the host country. Absorptive capacity includes types of trade regimes and the degree of openness and the level of human capital development which is the most essential in the contribution of FDI to growth.

Some other studies provide diverging results on the role of FDI spillovers with respect to stimulating economic growth. These studies deal with the productivity effect of FDI spillovers on firms or plants using micro level data. According to Blomström and Wolff (1994); Kokko (1994) Mexico has positive effect from spillovers together with Uruguay and Indonesia. While Venezuela and Morocco have no spillover emphasizing that the reason is based on absorptive capacity between countries to adopt FDI. Some authors argues that the adoption of new technologies and management skills require inputs from the labour force. High- level capital goods need to be combined with labour that is able to understand and work with the new technology. In order words, technological spillover is possible only when there is a certain minimum or threshold level of human capital available in the host country (Borensztein *et al.*, 1998). In effect this suggests that FDI and human capital are complementary in the process of technological diffusion. In the developing countries, FDI seems to have a somewhat smaller effect on growth, this is attributed to the presence of “threshold externalities”. Apparently developing countries need to have reached a certain level of development in human capital (Education, health, welfare, technology and infrastructure) before being able to benefit from a foreign presence in their markets. Also weak financial intermediation hits domestic enterprises much harder than it does to multinational enterprises (MNEs). The concept of human capital refers to the abilities and skills of human resources of a country, while human capital formation refers to the process of acquiring and increasing the number of persons who have the skills, education and experience that are critical for economic growth and development of a country (Okojie, 1995). Human resources are all

embracing, that is, it is inclusive of persons who works now, or are likely to be productively employed sooner or later. It is a continuum, a continuing process from childhood to old age, and a must for any society or enterprise that wishes to survive under the complex challenges of a dynamic world. [Yesufu \(2000\)](#), in agreement with this view, opines that “the essence of human resources development becomes one of ensuring that the workforce is continuously adapted for, and upgraded to meet, the new challenges of its total environment”. This implies that those already on the job require retraining, reorientation or adaptation to meet the new challenges. This special human capacity can be acquired and developed through education, training, health promotion, as well as investment in all social services that influence man’s productive capacities ([Adamu, 2003](#)). According the [Bloomstrom and kokko \(2002\)](#) While the role of MNCs in primary and secondary education is marginal, there is increasingly clear evidence that MNCs may have a noticeable impact on tertiary education in their host countries. The most important effect is perhaps on the demand side. MNCs provide attractive employment opportunities to highly skilled graduates in natural sciences, engineering and business sciences, which may be an incentive for gifted students to complete tertiary training, and MNCs demand skilled labour, which may encourage governments to invest in higher education. There are also more direct links between FDI and higher education. Apart from providing scholarships and sponsoring the formal education of individual employees in the host country or elsewhere, MNCs are also active in supporting the development of universities and related institutions in several ways. [UNCTAD \(1994\)](#) reports that the MNCs’ “demand for highly trained graduates manifests itself in the form of financial support, particularly to business schools and science facilities, the provision of assistance and advice through membership of advisory boards, curriculum review committees, councils and senates”. Some examples are given in [UNCTAD \(1999\)](#). In Thailand, various training programmes are run jointly by international chambers of commerce (of which MNCs are prominent members) and the Thailand government. In Malaysia, several skill development centres have been established jointly by the government, local business and foreign MNCs . The Penang Skills Development Centre, has been widely lauded for its success. Moreover, MNCs have been instrumental in the internationalisation of tertiary education, in particular management education. To facilitate the contacts and co-ordination of activities between the parent company and its foreign affiliates, many MNCs encourage local managers to obtain training in international business; in most cases, the MNCs also finance the training. The MNCs demand — and willingness to pay — for international management programmes is perhaps the main explanation for numerous cross-regional alliances involving leading Western business schools. Many of the studies undertaken in developing countries have emphasised the spillovers of management skills. Most MNCs provide some training for their employees, although the amount and type of training may vary depending on the industry, mode of entry, size and time horizon of investment, type of operations and local conditions. The level of the host country employees’ general and cognitive skills is particularly an important determinant for the amount of training undertaken, since a relatively high level of education reduces the cost of further training and raises the expected benefits. Competition is another important factor. Firms that

are protected from international or domestic competition are less likely to invest in costly training programmes (Bloomstrom and Kokko 2002).

The proponent of endogenous growth literature posit explicitly that human capital serves as a major driving force of technology progress and as an engine of economic growth (Romer, 1990). The endogenous growth model predicts that a permanent change in some policy variable can cause a permanent change in the economy's growth rate. Unlike time series evidence for the U.S, at first sight the data for many developing economics are broadly consistent with this prediction (Jones, 1995) the endogenous growth theory acknowledges the endogenous role of human capital accumulation in economic growth and distinguishes between labour and human capital. An existing literature also recognizes human capital created through investment in education and the development of skills as one of the most significant determinant of economic growth (Schultz, 1963; Barro and Sala-i-Martin, 1995) (Barro, 1998).

The exogenous technical progress of the neoclassical model can change in response to policy as well. According to Parente and Prescott (2000) the choices of each country's citizens determine how fast they raise productivity, by diverting their time from normal work to productivity-enhancing activities. In doing so, they can draw on the world stock of knowledge and borrow capital on world markets. Policy-induced constraints, such as taxation, or entry barriers at the plant level, create international differences in aggregate productivity, even when the stock of useful knowledge is common to all countries. Mankiw *et al.* (1992) found support for the human capital-augmented neoclassical model in a cross section of countries. But Pungo (1996) showed that the specification exhibits structural breaks, such that the coefficient on human capital is insignificant for a sample of labour-abundant countries and influential observations are excluded. A possible reason for these last results is that schooling and health services in developing economies tend to be of low and very variable quality. In summary, the literature on human capital and FDI indicates that human capital is an important determinant of FDI, especially among efficiency-seeking FDI that requires a skilled workforce as one of its key inputs. Although higher human capital does not appear to effect inflows of resources/market seeking FDI directly. It can indirectly affect FDI by improving civil liberties, health and crime rates. Basic schooling appear to be the minimal level of schooling required for FDI after the mid 1980s. Given that the tendency of FDI in recent years is towards relatively skill-intensive production and services, and less towards primary and resource-based manufacturing, basic schooling should be the absolute minimum level of education the developing countries must provide. For countries seeking to attract higher value-added MNCs, it is necessary to upgrade human capital way above the basic schooling level.

EMPIRICAL EVIDENCE

There exist a limited number of empirical studies of the relationship between FDI and host economic growth on the national level that employ rigorous econometrical framework. There are a large number of micro based studies such as [Aitken and Harrison \(1999\)](#) that analyses the productivity enhancing effect of FDI individual firms but this work focuses on macroeconomic level in analyzing the effect of FDI on economic growth.

[Balasubramanyam et al. \(1996\)](#) analyses how FDI affects economic growth in developing economics. He uses cross-section data and OLS regressions and finds that FDI has a positive effect on economic growth in host countries using an export promoting strategy but not in countries using an import substitution strategy. Also [Borensztein et al. \(1998\)](#) examine the role of FDI in the process of technology diffusion and economic growth, they also finds out that FDI has a positive effect on economic growth, but that the magnitude of the effect depends on the amount of human capital available in the host country.

[Carkovic and Levine \(2002\)](#) use a panel dataset covering 72 developed and developing countries in order to analyse the relationship between FDI inflows and economic growth. The study analysis both a cross-sectional OLS as well as dynamic panel data analysis using GMM. The paper concludes that there is no robust link running from inward FDI to host country economic growth. [Bengoa and Sanchez-Robles \(2003\)](#) investigate the relationship between FDI, economic freedom and economic growth using panel data for Latin America. He concludes that FDI has a significant positive effect on host country economic growth after comparing fixed and random effects estimations. Similar to [Borensztein et al. \(1998\)](#) the magnitude depends on host country condition (human capital). The effects of human capital on growth and productivity, export promotion, technology transfers and domestic economy have been significant through FDI. The evidence of various studies undertaken in countries which have developed human capital reveal that human capital attracted FDI and subsequently FDI impacted positively on growth and productivity. Evidence from a survey of the econometric analysis on the effects of FDI provides three types of evidences: first, there are country studies that examined macroeconomic effects of attracting FDI and its impact on domestic economy and on the average level of productivity in sector in which foreign investment is made ([Caves, 1974; Globerman, 1979](#)) or on productivity in the local industry ([Blomström and Persson, 1983](#)). Secondly, the cross-country studies find that FDI flows have been positively related with sound macroeconomic policies, per capita GDP growth or productivity ([Borensztein et al., 1998](#)). Thirdly, the econometric tests find that the productivity level of foreign firms is higher than domestic firms ([Djankov and Hoekman, 2000](#)), but the effects on productivity growth in domestic firms is mixed. As a result of foreign firms in a sector, domestic firms in the same sector could be better off as competition forces them to upgrade technologies [Blomstrom and Sjoholm \(1999\)](#). [Noorbakhsh et al. \(2001\)](#) evidence that the impact of human capital on FDI has

been statistically significant and positive. [UNCTAD. \(2002\)](#) also finds a high correlation between human capital development and FDI inflows. [Barro and Lee \(2000\)](#) also pointed out that from the mid 1980s; education increasingly turns into an important determinant in the development process and for foreign investors.

The experience of Singapore, china province, Taiwan, Ireland Costa Rica, Korea, and Malaysia suggests that these countries succeeded in attracting substantial FDI through human capital development. The economic planners of these countries recognized that skill development of their workforce is necessary for a sustained growth. Singapore used education and language policies as a vehicle to produce trained and globally competitive workforce. At the outset, a large fraction of unskilled workforce and a minuscule FDI were the core resources for their industrial development. Yet all of these countries readily realizes that the importance of foreign firm role in the economy heavy investments in human resources development and a steady supply of qualified and educated workforce, Initially, they could attract only low- value-added TNCs and with the accumulations of human capital stock these countries attracted high value- added TNCs ([Kapstain, 2001](#)). Some empirical research, suggests that firms are attracted to regions where is already high, in order words the lack of human capital may deter foreign direct investment. In spite of the need for developing countries to invest in education and training, it may be that the local educational system is simply unsuited or unable to provide the sorts of skills that multinational enterprises which are considering a foreign direct investment seek. The early study by [Richman and Melvin \(1972\)](#) of firm performance in India, they found strong correlation “between the proportion of Western- trained (this includes formal education) local nationals employed by firms both foreign and indigenous, and the firms relative economic success. Those with the highest proportion of its trained managers and specialists have generally been the most successful in their sectors”.

They also found that multinational firms (especially American) devote considerably more resources to training than do indigenous firms. Yet they asserts that the “training leaves much to be desired”. While there is some evidence in support of the theory that FDI contributed to economic growth via human capital of emerging economies, its overall educational remain difficult to quality and controversy. In most developing countries, FDI still accounts for only a small proportion of the GDP and total employment and so its impact on the economy and education is unlikely to be great.

Methodology and Specification of Model

Using a panel data, OLS multiple regression techniques will be adopted in the analysis using secondary data. These are based on endogenous Cobb-Douglas production function by [Solow \(1956\)](#). From our theoretical models we have that:

$$Y = K^{1-\alpha} (A h L)^{\alpha}. \text{ In equation } (1)$$

Since we have assumed the Cobb-Douglas production function, A is related to the total factor productivity which explains the output growth that is not accounted for by the growth in the factor

of production specified. We take the log of the standard augmented Solow model, the following equation is obtained:

$$GDPPCAP = f(, FDI, LA, HUMCAP, DI, INFR, OPP, INF, POLINST)$$

Where:

GDPPCAP = Real Gross Domestic Product per capita (in log form)

FDI = Foreign Direct Investment defined as (FDI/GDP* 100)

LA = Labour measured as the labour participation rate.

HUMCAP = Level of human capital (adult literate and health)

DI = Domestic investment (Gross Fixed capital formation (FCF/GDP* 100)

INFR = Infrastructure development (per capita electricity production and Telephone line)

OPP = Openness of the economy (total trade- GDP ratio.)

INF = Rate of inflation

Specifically, given the time series nature of the data, the postulated long run model is

Model

$$\begin{aligned} \text{LogGDPPCAP} = & \text{Log8}_0 + \text{Log8}_1 \text{FDI} + \text{Log8}_2 \text{HUMCAP} + \text{Log8}_3 \text{LA} + \text{Log8}_4 \text{DI} \\ & + \text{Log8}_5 \text{INFR} + \text{Log8}_6 \text{OPP} + \text{Log8}_7 \text{INFL} + e_i \end{aligned} \quad (2)$$

EMPIRICAL OF RESULT

Table-1. (NIGERIA) Unit Root Test at Ordinary and First Difference

Variables	Level(no trend)	Level(with trend)	1 st diff (no trend)	(no 1stdif trend)	f(with
ADF					
<i>LNGDPPCAP</i>	-2.280104	-3.135326	-3.537830**	-3.500549**	
<i>LN(FDI)</i>	-1.998955	-3.226069***	-10.63394*	-13.21115*	
<i>LNHUMCAP</i>	-0.921641	-2.512127	-5.885593*	-5.764899*	
<i>LNDI</i>	-1.139335	-2.649708	-5.849190*	-5.790344*	
<i>LNINFL</i>	-3.369341**	-3326994***	-5.726353*	-5.641561*	
<i>LNINFR</i>	0.928154	2.295686	-2.681590***	-4.343997*	
<i>LNL</i>	-1.554453	-1.420125	-3.338898**	-3.361889***	
<i>Critical Values</i>					
<i>1% level</i>	-3.670170	-4.323979	-3.679322	-4.309824	
<i>5% level</i>	-2.963972	-3.580623	-2.967767	-3.574244	
<i>10% level</i>	-2.621007	-3.225334	-2.622989	-3.221728	
PP					
<i>LNGDPPCAP</i>	-5.148668*	-5.581391*	-11.75011*	-11.67627*	
<i>LN(FDI)</i>	-4.994751*	-9.316472*	-22.81888*	-33.08790*	
<i>LNHUMCAP</i>	-0.660434	-2.512127	-5.973439*	-5.820070*	
<i>LNDI</i>	-0.915683	-2.702527	-6.407005*	-6.682712*	
<i>LNINFL</i>	-2.832546	-2.790191	-9.945584*	-10.02929*	
<i>LNINFR</i>	-0.023566	-1.602558	-3.145702**	-3.217541***	
<i>LNL</i>	-1.394071	-1.318267	-3.247541**	-3.273867***	
<i>Critical Values</i>					

<i>1% level</i>	-3.646342	-4.262735	-3.653730	-4.273277
<i>5% level</i>	-2.954021	-3.552973	-2.957110	-3.557759
<i>10% level</i>	2.615817	-3.209642	-2.617434	-3.212361

Note: * denotes significant at 1%, ** denotes significant at 5%, and *** denotes significant at 10%

Test for Unit Root (order of integration). Any of the forms of this test presume the existence of white noise errors in the regression. If that is implausible, the test will lose significant power. To cope with this issue, any of the ‘Dickey–Fuller’ tests in practice are usually employed as the “augmented Dickey–Fuller” test, or ADF test, in which a number of lags of the dependent variable are added to the regression to whiten the errors. Therefore using Augmented Dickey–Fuller (ADF) and Phillips–Peron unit root test we test for the presence of unit roots in the variables of the country. The table (1) found in the appendix shows that some of the variables such as LNINFL and LNFDI are stationary at level, in ADF while all other variables are integrated of order one. Also in PP LNGDPPCAP, LNFDI are stationary at level and all other variables are stationary at first difference. It also shows that the variables are mostly greater than 5% critical values. We now accept the null hypothesis of non-stationary for the entire test.

Table-2. Correlation Matrix

	LNGDPPCAP	LNFDI	LNHUMCAP	LNDI	LNINFL	LNINFR	LNLA	LNOPP
LNGDPPCAP	1.000000							
LNFDI	-0.288517	1.000000						
LNHUMCAP	0.299122	-0.539868	1.000000					
LNDI	0.323998	-0.395880	0.681323	1.000000				
LNINFL	-0.076713	0.105706	-0.054008	-0.349571	1.000000			
LNINFR	0.386921	-0.376218	0.634517	0.701699	-0.232356	1.000000		
LNLA	-0.455306	0.421292	-0.693930	-0.282854	-0.350713	-0.310474	1.000000	
LNOPP	-0.415125	0.425565	-0.752955	-0.532153	-0.127436	-0.537268	0.778990	1.000000

In table 2 which is correlation matrix, we examine the relationship among the variables. The result of the correlation matrix for the country Nigeria are reported in table (2). The table shows that most of the variables are correlated, except LNGDPPCAP that has no correlation; all other variables have traces of correlation in them.

Table-3. Johnasen and Juselius Cointegration Result of Growth - FDI Model and FDI-HCD Model.

Trend assumption: Linear Deterministic Trend

NIGERIA		Trace Statistics (Growth-FDI)	(8 Max) Max-eigen Staistics (Growth-FDI)	Trace stat (FDI-HCD)	(8 Max) Max-eigensta value(FDI-HCD)	0.05 value(Max)	Critic value(Max)	Critical
$r=0$	=1	285.0869*	111.2363*	281.2272*	107.9879*	159.5297	52.36261	
$r\Omega_1$	=2	173.8507*	69.10297*	173.2393*	67.51141*	125.6154	46.23142	
$r\Omega_2$	=3	104.7477*	44.53310*	105.7279*	38.7594	95.75366	40.07757	
$r\Omega_3$	=4	60.21458	36.98291*	67.01192	27.09808	69.81889	33.87687	
$r\Omega_4$	=5	23.23167	13.82762	39.91384	21.45169	47.85613	27.58434	
$r\Omega_5$	=6	9.404058	7.816406	18.46215	10.98364	29.79707	21.13162	
$r\Omega_6$	=7	1.587652	1.524238	7.478504	5.65904	15.49471	14.26460	
$r\Omega_7$	=8	0.063415	0.063415	1.819490	1.819490	3.841466	3.841466	

*Denotes rejection of the hypothesis at the 0.05 level. Trace test indicates 3 cointegratingeqn(s) at the 0.05 level and the Max-Eigen value test indicates 4 cointegratingeqn(s) at the 0.05level for Growth-FDI Model, while the Trace test for FDI-HCD Model indicates 3 cointegratingeqn(s) at 0.05 level and the max-Eigen value test indicates 2 cointegratingeqn(s) at 0.05 level.

The next is the cointegration test, the development of cointegration analysis allows for another approach to examine the relationship between fundamental variables. A set of variables are said to be cointegrated if they are integrated of the same order and a linear combination of them is stationary. Such a linear combination would then posit to the existence of a long-term relationship among the variables (Johanson and Juselius, 1990). Cointegration variables move together over time so that any shot run deviation from the long-term trend will be corrected. The test for number of cointegrating vectors in the JJ procedure can be conducted using two likelihood ratio (LR) test statistics namely the trace statistics and maximum Eigen value statistics. The cointegration table for Nigeria is shown in table(4) The result shows that Trace test indicates 3 cointegratingeqn(s) at the 0.05 level and the Max-Eigen value test indicates 4 cointegratingeqn(s) at the 0.05level for Growth-FDI Model, while the Trace test for FDI-HCD Model indicates 3 cointegratingeqn(s) at 0.05 level and the max-Eigen value test indicates 2 cointegratingeqn(s) at 0.05 level.

Table-4. Longrun Normalized Coefficients of Growth-Fdi Model

COUNTRIES / VARIABLES	LNGDPPC AP	LNFDI	LNHUMCAP	LNDI	LNINFL	LNINFR	LNLA	LNOPP
NIGERIA	-1 (2.99793)	-8.035180* (0.66291)	-3.683766* (0.03258)	-0.02883 (0.04495)	-0.205102* (0.08833)	-0.037974 (5.86354)	-57.12570* (-0.151602*)	

We then test for the long run normalized coefficient of growth-FDI model which is known as long run equilibrium estimates and its multiplied by1 in table(5). From the result FDI has a negative estimated coefficient and it is statically significant which means that there is a significant relationship between FDI and economic growth but the magnitude of the coefficient is small. This

implies that there are lapses in the area of attracting FDI into the country, therefore there should be improvement in the major determinant of FDI so as to attract more FDI especially in other sectors, because FDI in Nigeria is mainly channeled to oil sectors. It also means that any 1 percent increases in FDI will course a decrease in GDPPCAP. Equally all other variables have negative estimated coefficient and also have significant relationship with growth, only that their impact is very small.

Human capital variable proxy by adult literacy has a negative estimated coefficient and it is statistically significant. This means that there is significant relationship between Human capital and growth, but the magnitude of significance is very low. Following the work of [Obwona \(2004\)](#), one of the conditions for location of efficiency-seeking FDI is that there is ample supply of skilled and well disciplined labour, he notes that though there are cheap labours in Africa, yet there are shortage of highly skilled labours. The lack of middle or senior level entrepreneurial experience has increased the existing skill gap, and many foreign companies have resorted to employment of expatriate managers ([Bhinda et al., 1999](#)). This is also the case in Nigeria, where foreign companies and many conglomerates prefer expatriates as their senior managers. The companies only hire Nigerians on the condition of retraining and mostly this training is done outside the country. As [Adeolu \(2007\)](#) indicates in his findings show that the mean of the measure of human capital obtained for Nigeria is very low relative to that of the sub-Saharan African Countries.

Inflation (INFL) used as a proxy for macroeconomic instability, has a negative coefficient and has a significant relationship with growth, which conforms to the theory that lower inflation positively effects the economic growth. The lower inflation rate will increase the purchasing power per income, while higher inflation rate will erode the purchasing power of income. In other words an unstable macroeconomic environment discourages growth. [Borensztein et al. \(1998\)](#) and [Li and Liu. \(2004\)](#) also reported an indirect relationship between inflation and growth.

Openness has a negative coefficient and a significant relationship with economic growth, though some previous result like [Asiedu \(2001\)](#) reported positive relationship of trade with economic growth. In this work, the number of years covered in the analysis varies and the result here shows a very low significant relationship between trade and per capita GDP growth.

Table-5. Short Run Parsimonious Growth-- Fdi Model *(Dependent variable:Dgdppcap)*

Variable	Coefficient	Std>Error	t-Statistics	Probability
C	-0.219861	0.062335	-3.52705	0.0047
DGDPPCAP(-1)	-2.045314	0.062335	-11.23488	0.0000
DGDPPCAP(-2)	-1.890286	0.182050	-13.62868	0.0000
DGDPPCAP(-3)	-0.091660	0.138699	1.324039	0.2123
DFDI(-2)	66.34655	6.970332	9.518420	0.0000
DFDI(-3)	121.1639	7.309775	16.57560	0.0000
DHUMCAP(-1)	-1.658976	1.069610	-1.551011	0.1492

DHUMCAP(-3)	1.294913	0.675290	1.917567	0.0815
DDI(-2)	0.345064	0.059133	5.835408	0.0001
DDI(-3)	0.111068	0.050954	2.179742	0.0519
DINFL(-3)	-0.181939	0.067445	-2.697574	0.0207
DINFR(-2)	-1.565937	0.366023	-4.278245	0.0013
DINFR(-3)	3.465596	0.421856	8.215125	0.0000
DLA(-1)	-381.2711	29.85752	-12.76969	0.0000
DLA(-2)	132.0990	21.71262	6.115238	0.0001
DLA(-3)	212.4886	21.71262	9.786410	0.0000
DOPP(-1)	-0.378352	0.131047	-2.887155	0.0148
DOPP(-2)	-0.850053	0.1165696	-5.130193	0.0003
ECM(-1)	-0.131997	0.170233	-0.775391	0.4545
R-Squared	0.993023	Reset Test		
Adjusted R-Squared	0.981606	<i>F-statistics</i>	1.646758	
F-Statistics	86.97915	<i>Probaility</i>	0.245781	
Probability(F-stat)	0.000000	LM Test		
Normality Test		<i>F-statistics</i>	0.646758	
Jaque-Bera	0.475548	<i>Probability</i>	0.566491	
Probability	0.245781			

In the error correction mechanism, the short-run coefficient of growth was estimated following the general to specific approach, given the fact that the number of observation is not very large; the lag structure was restricted to a maximum period of three years. Insignificant lags were eliminated and the most parsimonious error correction mechanism for the effect of FDI on growth. For the purpose of this work we will use the Lagrange multiplier test (LM) for serial correlation. The short run analysis on FDI and Growth show that most of the independent variables had the expected relationship with the dependent variable GDPPCAP and almost all the variable entered are statistically significant except Human capital(HUMCAP(-1) that is statistically insignificant.

DFDI (-2)(-3) has a positive estimated coefficients and significant relationship with economic growth at 1percent respectively. This means that changes in FDI do matter for growth. The result implies that a one- standard deviation increase in the variable would raise the growth rate on impact. DHUMCAP(-1) has a negative estimated coefficient and it has statistically insignificant relationship with growth, meaning that in lag (-1), the quality of human capital in Nigeria cannot induce growth. For any significant contribution of human capital to economic growth, there is need for conscious development in a new and innovative way ([Otepola, 2002](#)). In lag 3 ie HUMCAP(-3) has a positive estimated coefficient and a significant relationship with economic growth which also means that one standard deviation increase in the variable would raise the growth rate. The ECM coefficient is -0.13 and is not significant. This suggests that the speed to adjust towards equilibrium is not in moderate condition, this shows that the variables does not adjust to equilibrium value within one year.

The diagnostic statistics shows that the equations are well specified. The R² (0.9930) and adjusted R² (0.9816) is very high and this fulfill the condition of goodness of fit. The F-statistics

86.9792(0.0000) is highly significant at 1% critical level, this show that there is significant relationship between the dependent variable and independent variables.

The Normality test was conducted and found that the residual is normally distributed (Jaqua-Bera statistics = 0.4755(0.7884).The model specification (Reset Test) was also conducted and the result indicates that there is no misspecification present 1.6468(0.2458).This shows that the models are well specified.

POLICY IMPLICATIONS AND RECOMMENDATIONS

It was found out that Nigeria has negatively significant effect on growth in the long run, which implies that FDI potentials are very small, may be due to inadequate development in the needed areas to attract FDI and more so the available FDI in Nigeria is channeled to the oil sector. Therefore there is need to put up an appropriate policy that will help develop other sectors of the economy. Also HUMCAP has negative significant effect on growth meaning that the potentials of human capital are very small and cannot induce growth. This implies that appropriate policy should be made to improve on the development of human capital.

In order to benefit more from the presence of foreign investors in to Sub-Saharan Africa countries and to Nigeria in particular, the linkages between the country and MNEs need to be strengthened, currently, domestic firms capabilities are inadequate with respect to offering high-quality products the MNEs would like to source domestically. They also lack the capacity to benefit from technological spillover, in order words it is useful to develop a national technology strategy that would focus on the main sectors for development, and then involve all parties concern with science and technology. These will be of benefits to the country in that such programme could raise the awareness of the value of technological knowledge by starting with the analysis of the current strength and weakness bringing forth the most priority sectors in question and then setting up an action plan that will enhance commitment by stake holders and the mobilization of resources. Following our literature on FDI and growth, all the important pre-requisites for positive FDI and growth should be met, in other to increase the benefits of FDI in Nigeria as well as other developing countries. While some of these countries have already liberalized its external sectors significantly, there is still room for improvement in important policy areas. Mostly in the area of financial sectors and human capital development in the country, which are the main sector to encourage the growth effect of FDI and the development of the economy.

SUMMARY AND CONCLUSION

This study examines foreign direct investment, human capital development and economic growth in developing countries: evidence from Nigeria within a cointegration and error-correction

modeling (ECM) framework during the period (1975-2008). The main objectives of this study is to empirically examine the relationship between FDI and GDP growth in Nigeria, also to assess empirically the long run sustainability of FDI- induced growth process. Data were collected from secondary sources analyzed with the aim of achieving these objectives. The error correction mechanism is appealing because of its ability to induce flexibility by combining the short run and dynamic and the long run equilibrium model in a unified system. We found the cointegration approach of Johanson and Juselius and its error correction model the most appropriate model for the estimation of the function based on its advantage of determining long run relationship. Moreover investment that will generate sustainable growth is a long run phenomenon therefore it requires a long run consideration.

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