

Foreign Direct Investment and Poverty in Nigeria: Further Evidence

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ABSTRACT

The main objective of this paper is to empirically investigate the contribution of FDI to Poverty Reduction in Nigeria, covering the period 1980-2010. Data on GDP by Income and Life Expectancy (proxy for poverty level), FDI, Agricultural Output and Government Expenditure: Health, Education, and Agriculture were used as variables in GDP by Income and Life Expectancy model respectively in this study. The study employed ADF and PP unit root tests, residual unit root test of co-integration and the error correction modelling methodology. Based on the data analysis of the two models, it was discovered that foreign direct investment has a positive significant impact on poverty reduction in Nigeria. It was recommended that for Nigeria to attract the desired level of FDI that will stimulate poverty reduction, it must introduce sound economic policies and make the country investor-friendly coupled with political stability, sound economic management and well developed infrastructure.

Keywords: *FDI, poverty, GDP by Income, life expectancy and poverty reduction*

INTRODUCTION

At the centre of global policy making, has been the issue of poverty. The motive to ameliorate extreme poverty in developing countries has become more urgent given the need to attain the year 2000 Millennium

Development Goals (MDGs) Declaration of the United Nations, which outlines eight commitments to be reached by developing countries by 2015. According to Olaniyan and Bankole (2005), poverty is a multifaceted concept which manifests itself in different forms depending on the nature and extent of human deprivation. The rate of poverty in developing countries especially Nigeria, is very alarming and disturbing, and this has been a source of great concern to government, policy makers and social scientists all over the world. Africa and Nigeria in particular, has witnessed monumental increase in the level of poverty (National Bureau of Statistics, 2010).

Prior to the discovery of oil commercially in Nigeria, the economy depended mainly on agricultural products for its domestic food supply and foreign exchange earnings. But with the advent of the oil boom period, less attention was paid to the non-oil export sector (Abimiku, 2006). Hence, when oil prices began to fall in 1982, the welfare system was affected, per capita income and private consumption dropped. That marked the beginning of real poverty in Nigeria (Osahon & Osarobo, 2011). Over the past few years, the Nigerian government has spent colossal sum of money both at the Federal, State and Local government levels in vain attempts to ameliorate the scourge (poverty) by initiating and executing several poverty alleviation programmes, but however, many of the “**NOVEAU RICHE**”, who are put in charge of such programmes have been accused of having only succeeded in enriching themselves, and thus, sending the country deeper in the abyss of higher poverty and inequality (Osahon & Osarobo, 2011).

Eze (2009) asserted that the level of poverty is geometrically increasing (See also Okpe & Abu, 2009). Poverty is deep and pervasive, with about 70 per cent of the population living in absolute poverty (Okonjo – Iweala, Soludo & Muhtar, 2003). According to the National Bureau of Statistics (2010), the incidence of poverty in Nigeria is rising, with almost 100 million people living on less than \$1 dollar a day, despite strong economic growth. The percentage of Nigerians living in absolute poverty, that is, those who can afford only the basic needs of life, such as food, shelter and clothing rose to 60.9 per cent in 2010, compared with 54.7 per cent in 2004. Although, Nigeria’s economy is projected to continue growing, given a 7.6 per cent GDP growth in the country, poverty is likely to get worse as the gap between the rich and the poor continue to widen (Gbola, 2012).

With the situation notwithstanding, Nigeria is endowed with abundant resources. Chukwuemeka (2009) observes that the country is blessed with natural and human resources, but in the first four decades of its independence, the country's potentials remained untapped and even mismanaged (See also Omotola, 2008). Nwaobi (2003), stressed that Nigeria presents a paradox- the country is rich, but the people are poor. Given this, the country should not suffer poverty entrapment. The monumental increase in the level of poverty has made the socio-economic landscape frail and fragile (Oshewolu, 2011). Today, Nigeria is ranked among the poorest countries in the world (Oshewolu, 2011). More so, on-going policy measures and programmes do not seem to be enough to rescue the oil exporting country from an unbroken story of want and penury. Hence the need for poverty reduction has taken centre stage amongst developing economies with emphasis on public-private partnership.

Foreign direct investment (FDI) have been seen as a source of economic development, modernization, income growth, employment and so, poverty reduction by developing countries in Asia, Africa and Latin America. This is shown by their currently pursued economic policies, which is explicitly intended to improve conditions to attract FDI and to maximize the benefits of the presence of FDI in their domestic economy. Over the past two decade these countries including Nigeria, have implemented broad ranging economic reforms including the liberalization of their foreign trade and investment regimes and domestic markets and privatization of state companies, which has had an effect on the flow and nature of foreign investment. Until recently, the Nigerian economy was driven largely by domestic investment (Daudu, 2008). The importance of foreign capital to developing countries is well known. It supplements their domestic savings and it is often accompanied with technology and managerial skills, which are indispensable in economic development.

Foreign direct investment can contribute in significant ways in breaking the growth – poverty vicious cycle; and there lies Nigeria's hope. Given this global problem, poverty, the unfolding reality of the world's economy has renewed the catalytic role ascribed to foreign direct investment in the development process. Much in the same way, as is assumed in the trade literature that trade is "good for the poor", and FDI is assumed to be good for growth, *ceteris paribus*, FDI must be good for poverty reduction (OECD, 2002). FDI, according to the modernization and the vicious cycle of poverty thesis, is thought to

provide the needed capital for Nigeria to break out of the cycle of poverty through employment generation, which leads to income for the people, who in turn save. This is further re – invested into the economy for development and growth. Despite the government’s allocation of financial resources to combat poverty, the sad fact is that poverty has continued to grow at a fast pace over the last 15 years.

Thus, the paper attempts to find answer to the following questions: does FDI contributes to poverty reduction in Nigeria? And what is the relationship between FDI and poverty reduction in Nigeria? To this end, time series data covering a period of thirty one (30) years will be adopted. GDP by income and Life expectancy will be used as proxy for poverty level in different model. The paper is essentially divided into five sections. First is the introduction, followed by review of literature on FDI and poverty in section two. The third section provides the theoretical framework, model specification and methodology. Fourth section presents the empirical result and analysis while the fifth section comprises conclusion and recommendations.

LITERATURE REVIEW

Conceptual Clarification: FDI

According to Graham & Spaulding (1995), FDI is defined in a classical way, as a company from one country making physical investment into building a factory in another country. Foreign direct investment is seen as a form of lending or finance in the area of equity participation. Thus, FDI plays an extraordinary and growing role in global business. The attribute of foreign direct investment is that it is less volatile and resilient to perturbations in the economy. This form of investment is often geared towards export and market development. Several variants of FDI are discernable in the literature to include, wholly owned enterprise, joint ventures and special contract arrangement, contract consultancy, turkey contracts, sub-contracting, quality control and standard services, and so on (Vera-Vassallo, 1996; Aremu, 1997; Obadan, 2000).

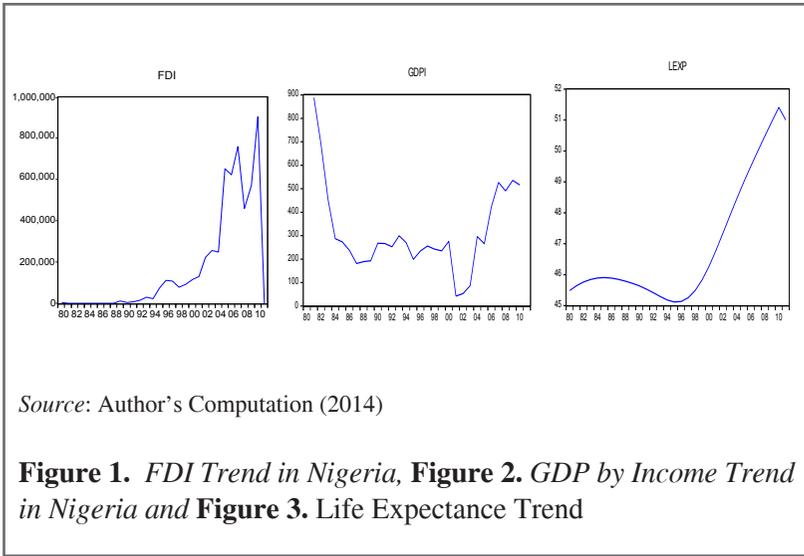
So many people argue that the flow of FDI could fill the gap between desired investment and domestically mobilized saving (Todaro & Smith, 2003; Hayami, 2001). Many scholars confirm that the benefits accrued from FDI may include the acquisition of new technology, employment creation, human capital development,

contribution to international trade integration, enhancing domestic investment and increasing tax revenue generated by FDI (Jenkins & Thomas, 2002; World Bank, 2000). All of these benefits are expected to contribute to higher economic and employment growth, which is an effective tool for achieving improvement in the reduction of poverty. However, Bende and Ford (1998), submit that the wide externalities in respect to technology transfer, the development of human capital and the opening up of the economy to international forces, among other factors, have served to change the former image.

Caves (1996) observe that the rationale for increased efforts to attract more FDI stems from the belief that FDI has several positive effects. Curiously, the empirical evidence of these benefits, both at the firm level and at the national level remain ambiguous. De Gregorio (2003) while contributing to the debate and importance of FDI notes that FDI may allow a country to bring in technologies and knowledge that are not readily available to domestic investors and in this way, increases productivity growth throughout the economy. FDI may also bring in expertise that the country does not possess and foreign investors may have access to the global markets.

The channels through which FDI can bring about economic growth have been fundamentally demonstrated by Ajayi (2006) and Borensztein et al, (1998). However, recent studies have shown that FDI can contribute to National economic issues in most developing economies, amid this is poverty (see Oriakhi & Osemwengie, 2012; Osemwengie & Sede, 2013).

Figure 1, 2 and 3 below show the trend of FDI, GDP by income and life expectance in Nigeria. Figure 1 indicates gradual rise in FDI inflows until 2010 where the effects of the global meltdown resulted, perhaps, in the sharp drop in FDI inflow. Now that confidence is gradually restoring to the global markets, it is expected that the trend will continue to rise. On the main, figure 2 exhibited similar trend. The crash in world oil price in the early 80s resulted in the fall of income in Nigeria. As the economy gathers momentum in the late 80s, there was a gradual rise in income until early 2000s and thereafter continue to rise. It can be argued that the rise in FDI in the early 90s resulted perhaps in the roughly growth in income in those periods thus translating to poverty reduction. The same is true with figure 3. The rise in FDI inflow, perhaps, explains the improvement in life expectance rate indirectly especially through FDI-Income transmission, hence poverty reduction.



Conceptual Issues on Poverty

A search of literature has shown that there is no general consensus on the definition of poverty. Poverty is not an easy concept to define. As a result, a range of definitions exist, influenced by different disciplinary approaches and ideologies. Poverty is a multi-dimensional issue that affects many aspects of human condition ranging from physical to moral and psychological (Ogwumike, 2002). The dominant western definition since World War II, defined poverty in monetary terms using levels of income or consumption to measure poverty and defining the poor by a head count of those who fall below a given income, consumption level or poverty line (Grusky & Kanbur, 2006). However, this economic definition has been complemented in recent years by other approaches that define poverty in a more multidimensional way (Subramanian, 1997). These approaches include the basic needs approach (Streeton, Burki, Ultagm, Nicks & Stewart, 1981), the capabilities approach (Sen, 1999) and the human development approach (UNDP, 1990).

It is also reflected in the Organization for Economic Cooperation and Development (OECD) conceptualization of poverty, which was defined as interlinked forms of deprivation in the economic, human, political, socio-cultural and protective spheres (OECD, 2006).

Poverty is also defined by a sense of helplessness, dependence and lack of opportunities, self-confidence and self-respect on the part of the poor. Indeed, the poor themselves see powerlessness and voicelessness as key aspects of their poverty (Narayan, Chambers, Shah & Petesch, 2000). Further, the acknowledgement of the multidimensionality of poverty is reflected in the range of both quantitative and qualitative methodological approaches adopted to conceptualize and measure poverty (Handley, Higgins, Shama, Bird & Cammack, 2009).

Evbromeran (1997) observed that poverty can cause fear, depression, despondency and suicides as well as revolution, envy, bitterness, self-depreciation of ego etc. In relative terms, poverty is conceptualized in terms of the standard of living that prevails in a given society. Thus, relative poverty exist where household within a given country have per capita income of less than one third of the average per capita of such country (World Bank, 1997). Relative poverty will occur when certain section of the society do not have adequate income to enable them have access to some basic needs being enjoyed by other sections of such society.

Poverty can also be subjective. Subjective poverty, require the individual (including the poor) to specify that they consider to be a minimal adequate standard of living or an income or expenditure level, they personally considered to be absolute minimal (Ogwumike, 2002). There is also material poverty which is taken to imply lack of ownership and control of physical assets such as land and animal husbandry (UNDP, 1999). This is similar to the concept of exchange entitlement and capabilities propounded by Sen (1981) and Dreze and Sen (1989). Other concepts of poverty that have evolved overtime include transitory and chronic poverty. Transitory poverty is temporary transient and short term in nature, while chronic poverty is a long term persistent poverty, the causes of which are structured (Haddad & Ahmed, 2003).

FDI and Poverty Reduction

FDI's influence on poverty reduction can be classified into direct and indirect impacts. The indirect impact works through FDI's contribution to economic growth given the increasingly accepted role of economic growth in poverty reduction (World Bank, 2000/2001;

IFC, 2000; Dollar & Kraay, 2001a). In addition, FDI contributes to tax income of the state budget and may thus facilitate government led programmes for the poor (Klein, Aaron & Hadjimichoal, 2002). Moreover, FDI may induce host governments to invest in infrastructure. If this investment is in poor areas, it may benefit the local poor. The direct impact of FDI on poverty is assumed to be its effects on unemployment (Chudnovsky & Lopex, 1999; IFC, 2000; Saravanamuttoo, 1999).

FDI's direct impacts on poverty may work through providing opportunities, particularly providing jobs and training to local workers. To the extent that foreign capital inflows do not replace local investment absolutely, and foreign investment takes the mode of green field investment, FDI may contribute to reducing existing unemployment and underemployment, providing people with income and therefore directly contributing to poverty reduction. In this sense FDI's impact on poverty works through its impact on employment. This impact has been considered a major impact of FDI on poverty (Chudnovsky & Lopez, 1999; IFC, 2000; Saravanamuttoo, 1999). FDI's impact on employment refers not only to employment created within FIEs (direct employment), but also to employment created in related entities vertically or horizontally or macro economically (indirect employment) (UNCTAD, 1994). With direct employment, FDI may reduce unemployment or underemployment when it comes under the mode of green field investment. Green field investment implies investment which relates to producing distinctive products without close substitutes in the host country. Conversely, FDI may raise unemployment when it is a merger and acquisition (M&A) activity. This is because M&A activities are usually followed by restructuring the merged enterprise in accordance with the objectives underlying the M&A (UNCTAD, 1999). However, when FDI takes the mode of merger and acquisition of moribund enterprises, it may help prevent potentially increased unemployment and therefore poverty.

FDI also has an indirect impact on poverty; FDI may affect economic growth through raising total capital formation. This is because FDI provides external finance and may help reduce financial constraints on investment due to low savings in LDCs. Moreover, FDI may crowd in domestic investment through backward and forward linkages further pushing economic growth. In addition, inward investment may induce local governments to invest in infrastructure

like roads, bridges, harbours, water and electricity supply, which might facilitate domestic investment as well.

Externalities and spill over effects that foreign invested enterprises may have on domestic ones horizontally and or vertically have also been recognized as a benefit accruing to host LDCs. More importantly, FDI may bring technology, know-how, management and marketing skills to LDCs, representing something more than a simple import of capital (Blomstrom & Kokko, 1996). According to Caves (quoted in Anderson, 1989), this is considered as the most powerful effect on growth of FDI. In addition to the effects on growth, FDI may affect local poverty through its contributions to the budget of the host country and through its effect on government investment. FDI contribution, notably in terms of tax and fee payments, allows the host country to raise its spending on social programmes. If these programmes are targeted at the poor, say, investing in irrigation system in rural roads, schools, clean water, healthcare, FDI may considerably contribute to local poverty reduction by inducing local governments to invest in infrastructure (such as roads construction, electricity, portable water and sanitation supply, etc.) in a manner that benefits the local poor.

Unfortunately, empirical evidence regarding what impact FDI has had on poverty reduction in developing countries is limited, but there are few studies that tried to analyse empirically this relationship. However, there is general consensus that FDI is no panacea, but, it can have a positive impact on poverty reduction in developing countries (through a variety of ways as mentioned above), provided that mechanisms are in place in the host country to have these positive effects. In other words, the impact of FDI on poverty and other social goals of development depend principally on many factors such as, host country policies and institutions, the quality of investment, the nature of the regulatory framework, the flexibility of the labour market, and many others. Among these various forms of FDI contributions, it is widely believed that the most important one for reducing poverty is widening access to employment, especially productive employment. Experience in many developed countries shows that insufficient job opportunities are the result of inadequate levels of investment, both domestic and foreign. Low investment also makes other forms of poverty alleviation more difficult, because lower rates of economic growth than the rate of population growth means that each year more people are added to the rank of the poor. Domestic and foreign

investors are potential sources for capital formation (Saravanamuttoo, 1999).

FDI may contribute to growth and reduce poverty through employment creation. Unemployment is one of the major challenges facing LDCs today and employment creation is believed to be one of the rapid ways of poverty reduction. FDI may enhance employment deliberately (Christoph, 2005). Iyanda (1999), using data for Namibia, finds that about two to four jobs are created locally for each worker employed by an IMNC. Okpe and Abu (2009) studied the impact of foreign private investment and poverty reduction in Nigeria using regression analysis for the period 1995 to 2003, the test demonstrated that, the inflow of foreign private investment had a positive and significant relationship to poverty reduction in the country.

FDI may also result in crowding in domestic investment in the host country. This in turn leads to increase in income, hence, poverty reduction (Adeolu, 2007). A study made by Weeks (2000) and Agosin (2000) shows that Asia is the region with the strongest crowding-in-effect, while Latin America with the most far reaching liberalization of FDI rules in the 1990s, does not benefit from crowding-in effects. Looking closer at Argentina, Brazil and Mexico, the studies show a slightly more positive picture than for the whole region, meaning a neutral effect or slight crowding out effect for the 1990s (See also Kulfas, Porta & Romas, 2002; Ibarra, 2004).

METHODOLOGY

Model Specification

In order to adequately capture and empirically analyse the impact of foreign direct investment on poverty reduction in Nigeria, a two-model-multiple regression econometric equations is specified in line with the empirical reviews in section two. The study used monetary (GDP by income) and non-monetary (Life expectancy) measures to capture poverty reduction. The aim was to know if the same findings can be obtained by using different proxies for poverty reduction. The assumption here is that the dependent variable is a linear function of the independent variables. Functionally, the models are presented thus:

$$GDPI_t = f(FDI_t, GEXH_t, AGROP_t, GEDU_t, GEXPA_t) \quad (1a)$$

$$LEXP_t = f(FDI_t, GEXH_t, GEDU_t, AGROP_t) \quad (1b)$$

Where: GDPI- gross domestic product by income, LEXP-life expectancy, FDI- foreign direct investment, GEXH- government expenditure on health, GEDU-government expenditure on education, GEXPA-government expenditure on agriculture and AGROP-agricultural output all at time-t.

Adding stochastic error terms at time t (U_t) to the functional form of the models (that is, model 1a and 1b) yields the final form of the econometric models to be estimated as:

$$GDPI_t = \alpha_0 + \alpha_1 FDI_t + \alpha_2 GEXH_t + \alpha_3 AGROP_t + \alpha_4 GEDU_t + \alpha_5 GEXPA_t + U_{1t} \quad (2a)$$

$$LEXP_t = \beta_0 + \beta_1 FDI_t + \beta_2 GEXH_t + \beta_3 GEDU_t + \beta_4 AGROP_t + U_{2t} \quad (2b)$$

Economic theory explains the nature of the variables in use and their relationship with one another, especially the explained variables and the explanatory variables. The evaluation therefore, is based on whether the coefficients (in this case α and β) conform to economic postulation. The expected relationship is that FDI, government expenditure on health, government expenditure on education and agriculture coupled with agricultural output should have significant and positive impact on poverty reduction in Nigeria. While the error term (U_{it}) is assumed to be white, that is, the error term is a random walk that has well-defined probabilistic properties (see also Gujarati & Porter, 2009).

The Method

Methodology provides analyst and policymaker with a valuable economic representation of the sector and a laboratory for testing idea and policy proposal (Hazel & Norton, 1986). The data used in this paper, which covered the period 1980 – 2010, were sourced from the Central bank of Nigeria’s Annual Report and Statistical Bulletin (2010) and also from the National Bureau of Statistics (2010). The estimation techniques adopted in this study include; Unit root test,

Cointegration and Error Correction Modelling (ECM) and they are discussed below.

Unit Root Test

Unit root test can be used to determine if trending data should be first differenced or regressed on deterministic functions of time to render the data stationary. If the variables are I (1), then the cointegration technique can be used to model the long run relations. Useful surveys on issues associated with unit root testing are given in (Stock, 1994; Maddala & Kim, 1998; Phillips & Xiao, 1998).

In this study, we employed Augmented Dickey Fuller (ADF) test and the Phillips-Perron (PP) (1988) test. The PP test is argued to be more robust to serial correlation and time-dependent heteroskedasticity and improves over the ADF test on the finite sample properties. PP tests are nonparametric in nature and applicable to a wide class of dependent and heterogeneously distributed innovations (Enders, 1995), hence, the inclusion in this study.

Co-integration Test

Johansen cointegration methodology is used to test whether two or more variables exhibit long run equilibrium relationship(s) and if they share common trend(s). The pioneering work by Engle and Granger (1987), Hendry (1986) and Granger (1986) on the cointegration technique identified the existence of a cointegrating relationship as the basis for causality. According to this technique, if two variables are cointegrated, causality must exist in at least one direction (Granger, 1988; Miller & Russek, 1990) and may be detected through the error correction model derived from the long run cointegrating vectors. Johansen cointegration is appropriate for system equations model and since our equations are not systematic, we adopt the residual unit root test which is appropriate in this study.

Error Correction Modelling (ECM)

An error correction representation always exists in cases where a number of variables (for example X_1 and Y_1) are found to be cointegrated (Engle & Granger, 1987). The implication here is that a change in the dependent variable is a function of disequilibrium in the

cointegrating relationship as captured by the error correction as well as changes in other explanatory variable(s). In this case, either DX_t or DY_t or both must be caused by e_{t-1} (the equilibrium error) that is itself a function of X_{t-1} and Y_{t-1} . The Error Correction Model (ECM), opens an additional channel for Granger causality (ignored by standard Granger and Sims test) to emerge through the error correction term. As clearly explained in Erjavec and Cota (2003), we rely on the statistical significance of the F – tests which are applicable to the joint significance of the sum of the logs of each explanatory variable and or the T- test of lagged error correction term(s), so as to indicate Granger causality or endogeneity of the dependent variable.

PRESENTATION AND ANALYSIS OF RESULTS

Unit Root Tests Results

In order to test for the stationarity of variables used in this study, unit root testing of all the variables in the two models was carried out using the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) methodology. Since there is a possibility that the series would have linear trend, we then use intercept and linear trend in the unit root tests. The unit root tests results are presented below:

Table 1a

Summary of Unit Root Tests Using the PP Criterion

Variable	Level	Order of Integration	First Difference	Order of Integration	Decision
GDPI	-3.6589**	I(0)	-12.4432*	I(1)	Stationary
LEXP	0.2599	I(0)	-4.96198*	I(1)	Stationary
FDI	-1.0384	I(0)	-10.2731*	I(1)	Stationary
GEXH	0.0658	I(0)	-6.4542*	I(1)	Stationary
GEDU	-1.0274	I(0)	-16.3180*	I(1)	Stationary
GEXPA	-4.9125*	I(0)	-22.3382*	I(1)	Stationary
AGROP	-0.4198	I(0)	-6.9376*	I(1)	Stationary

*Critical values at 1% and 5% respectively are -4.3098 and -3.5742. *Significant at 1% and **Significant at 5%.*

Table 1b*Summary of Unit Root Tests Using the ADF Criterion*

Variable	Level	Order of Integration	First Difference	Order of Integration	Decision
GDPI	-3.3240	I(0)	-12.4432*	I(1)	Stationary
LEXP	-7.6498*	I(0)	-5.8553*	I(1)	Stationary
FDI	-1.4395	I(0)	-4.9617*	I(1)	Stationary
GEXH	0.9946	I(0)	-5.3817*	I(1)	Stationary
GEDU	-3.8551**	I(0)	-6.9964*	I(1)	Stationary
GEXPA	-4.9156*	I(0)	-4.8335*	I(1)	Stationary
AGROP	-0.4198	I(0)	-6.7236*	I(1)	Stationary

*Critical values at 1% and 5% respectively are -4.3239 and -3.5806. *Significance at 1% and **Significance at 5%.*

Note that the PP and ADF criterion in Table 1a and 1b respectively show that all the variables, viz., GDP by income (GDPI), life expectancy (LEXP), foreign direct investment (FDI), government expenditure on health (GEXH), government expenditure on education (GEDU), government expenditure on agriculture (GEXPA) and agricultural output (AGROP) are difference stationary, that is, they are I(1) variables at 1 per cent level of confidence. Based on this, we therefore conclude that the variables used in this study are unit roots free. Therefore, we proceed to test the existence of co-integration among the variables in each model.

Co-integration and Error-Correction Modeling Results

The standard procedure of obtaining short-run dynamics suitably described by an error-correction model can be obtained by the use of autoregressive distributed lag (ARDL) model provided meaningful long-run relationship (co-integration) exist among a given set of variables. Using the Schwarz Bayesian criterion which is appropriate for ARDL model, we obtain the parsimonious error-correction representation of each model. The co-integration and error correction model are reported on Table 2.

It can be verified from Table 2 that GDPI is co-integrated with FDI, GEXH, GEDU, AGROP and GEXPA using the residual unit root test of co-integration. Note that the absolute value of the PP test-statistic (-5.2447) is larger than the absolute value of the 1 per cent critical value of -4.2967. The same result is true for the ADF criterion. Thus using both criteria, there exists a long-run equilibrium relationship among the six variables and they cannot wander apart arbitrary.

Having established the existence of cointegration, we can therefore estimate an error-correction model using the autoregressive distributed lag technique. The parsimonious representation of the error-correction model is reported in Table 3.

The gross domestic product by income (GDPI) model is very robust as it has an R-Bar squared of 0.84. Thus, the regressors in this model explain over 84 percent of the systematic variations in the GDPI model in the period under review, 1980 through 2010. The

Table 2
Co-integration Test Result of GDPi on FDI, GEXH, GEDU, AGROP and GEXPA

(Residual unit root tests based on PP and ADF criterion)

Variable	Phillips-Perron Criterion			Augmented Dickey-Fuller Criterion		
	Level	Order of Integration	Decision	Level	Order of Integration	Decision
Model one residual	-5.2447*	I(0)	Stationary	-5.1888*	I(0)	Stationary

*Critical values at 1% and 5% respectively are -4.2967 and -3.5683. *Significance at 1% and **Significance at 5%.*

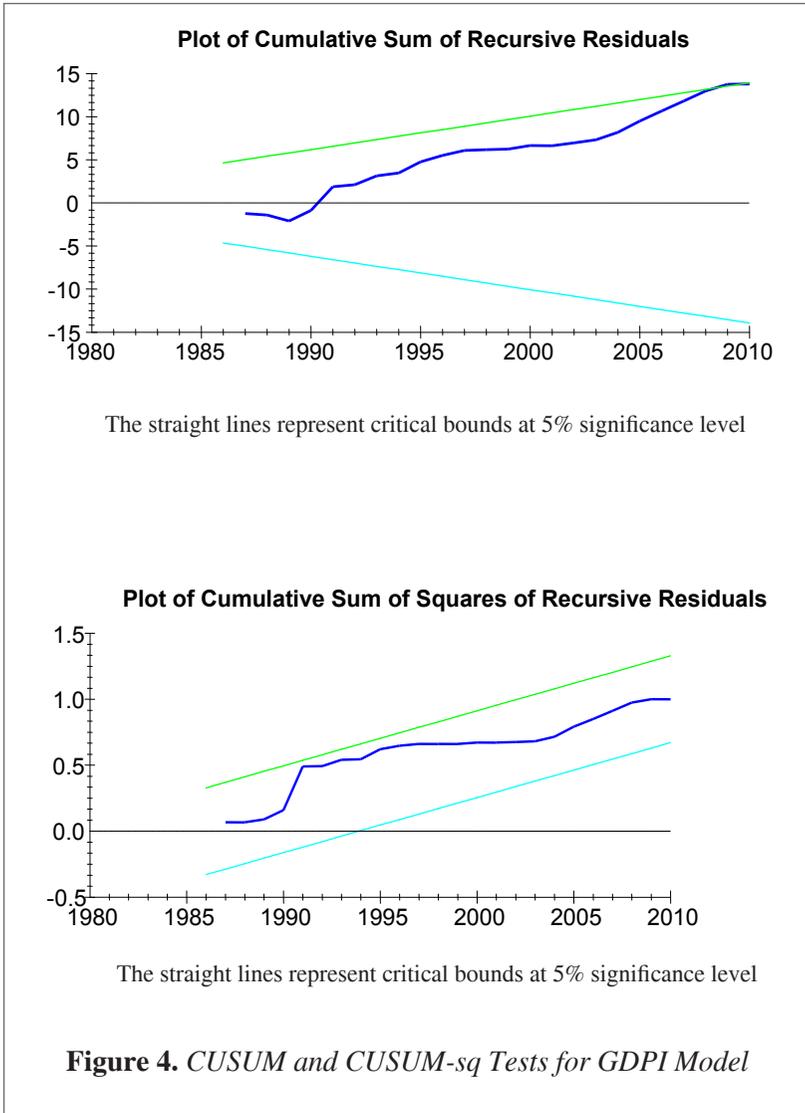
Table 3
Parsimonious Error Correction Model for GDPI based on Schwarz Criterion

Dependent variable is dGDPI
 28 observations used for estimation from 1983 to 2010

Explanatory variable	Coefficient	Standard error	T-ratios [prob.]
dGDPII	.25774	.069635	3.7013[.002]
dDFDI	.2077E-3	.1281E-3	1.6211[.121]
dDGEXH	-.015136	.0027778	-5.4488[.000]
dDAGROP	.0027366	.0011210	2.4412[.025]
dDAGROP1	-.0031884	.9042E-3	-3.5263[.002]
dDGEDU	.0047617	.8826E-3	5.3949[.000]
dDGEXPA	.0013331	.8988E-3	1.4832[.154]
dC	-23.7031	14.0513	-1.6869[.108]
ecm(-1)	-.58826	.15893	-3.7015[.002]
R-Squared	.9011	R-Bar-Squared	.84293
S.E. of Regression	45.9321	F-stat. F(8,19)	9.3628[.000]
Mean of Dependent Variable	6.4363	S.D. of Dependent Variable	115.8976
Residual Sum of Squares	35865.8	Equation Log-likelihood	-139.9050
Akaike Info. Criterion	-150.9050	Schwarz Bayesian Criterion	-158.2321
DW-statistic	2.3436		

model has an F statistic of 19.36 (with a p-value of 0.000). Thus, the hypothesis of a linear relationship between GDPI and the explanatory variables in the model cannot be rejected at the 1 percent confidence level. The adequacy of the model was further buttressed by the low standard error of the regression. The residual sum of squares also reveals the absence of misspecification error. The Durbin-Watson statistic value of 2.34 is sufficiently close to 2 to suggest any autocorrelation or specification error. The ECM (error correction mechanism) had a negative sign as expected and with a t-statistic of -3.70 passed the significance test at the 1 percent confidence level. Thus, the ECM will rightly act to correct any deviation of the dependent variable from its long run equilibrium. This shows a dynamic adjustment from the short run to the long run equilibrium. The speed of adjustment is reasonably high, this is shown by the coefficient of the ECM (-0.58) which means that a very significant adjustment to long-run equilibrium is completed during the current year. In other words, the disequilibrium in the previous year's shock adjusts back to the long run equilibrium in the current year. All the variables proved to be significant in explaining GDPI (proxy for poverty reduction). Only GEXH did not conform to theoretical expectation though significant at 1 per cent level. AGROP and GEDU were correctly signed and also significant at 5 per cent level while FDI and GEXPA had positive signs but were significantly different from zero at the 10 percent confidence level comparing their t-ratios values which is greater than 10 per cent t-critical value of 1.32. This implies that FDI (the variable of interest) including its own lagged value and the other explanatory variables (GEXH, GEDU, AGROP and GEXPA) contribute significantly to poverty reduction in Nigeria in the short-run as covered by the study.

Figure 4 above shows CUSUM (cumulative sum) and CUSUM-sq (CUSUM squared) test for GDPI model. CUSUM and CUSUM-sq test do not exceed the critical boundaries at 5% level of confidence as displaced in the figures. This implies that the model of poverty (proxy by GDPI) is accurately specified and long run coefficients are meaningful and reliable. The life expectancy model was very good, with an R-Bar squared of 0.99 percent. Thus, the explanatory variables used in the model sufficiently explain over 99 percent of the systematic variations



in the LEXP model between 1980 and 2010, and leaving less than 1 percent to the error term. The F-statistic of 201.51 (with a p-value of 0.000) easily passes the significance test at the 1 percent level. Hence, the hypothesis of a significant linear relationship between LEXP and the regressors in this model is validated. The standard error of regression and the residual sum of squares are very small. This

means that we can rely on the predictive power of the model. The ECM (error correction mechanism) had a negative sign as expected and with a t-statistic of -2.58 passed the significance test at the 1 percent confidence level. Thus, the ECM will rightly act to correct any deviation of the LEXP from its long run equilibrium. This shows a dynamic adjustment from the short run to the long run equilibrium. The speed of adjustment is very high, this is shown by the coefficient of the ECM (-0.03) which means that a very significant adjustment to long-run equilibrium is completed during the current year. All the regressors contributed significantly to poverty reduction (proxy by LEXP) including its own lagged value. Foreign direct investment and government expenditure on education contributed positively in line with theoretical expectations while government expenditure on health and agricultural output contributed negatively against theoretical expectations. With a t-critical value of 1.71, FDI and GEDU were significantly different from zero at 5 percent confidence level. Thus, a unit increase in FDI and GEDU will cause life expectancy to rise by .8157E-7 and .2522E-6 units respectively. This translates to poverty reduction in the short. Also, with a t-value of 1.71, government expenditure on health was significantly different from zero at 5 percent level of confidence (though negative). This negative sign may be due to the lack/poor infrastructure in the health sector. This is a major feature of most developing countries in Africa. Finally, agricultural output (though negative) passes the significant test at 10 percent confidence level. Thus, it is a weak determinant of LEXP in Nigeria in the period under review.

Finally, to state that FDI contributes significantly to poverty reduction in Nigeria in the period covered by the study is stating the obvious. Also, the model of poverty reduction proxy by life expectancy (LEXP) is sufficiently reliable as indicated in figure 5 by the CUSUM and CUSUM-sq tests.

Like figure 4 above, figure 5 also shows CUSUM and CUSUM-sq test for LEXP model and the test results have similar conclusion. CUSUM and CUSUM-sq test do not exceed the critical boundaries at 5% level of confidence in the figures. This means that the model of poverty (proxy by LEXP) is accurately specified and long run coefficients are meaningful and reliable.

Table 4

Co-integration Test Result of LEXP on FDI, GEXH, GEDU and AGROP

(Residual unit root tests based on PP and ADF criterion)

Variable	Phillips-Perron Criterion		Augmented Dickey-Fuller Criterion		
	Level	Order of Integration	Decision	Level	Order of Integration
Model two residual	-2.6976	I(0)	Non-Stationary	-6.1625*	I(0)
					Stationary

*Critical values at 1% and 5% respectively are -4.2967 and -3.5683. *Significance at 1% and **Significance at 5%.*

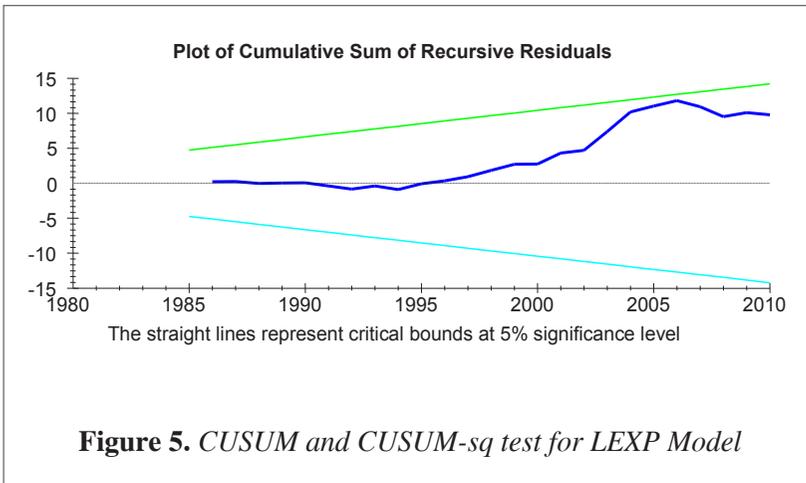
Table 5
Parsimonious Error Correction Model for LEXP

Dependent variable is dDLEXP
 26 observations used for estimation from 1985 to 2010

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dDLEXP1	1.7149	.11037	15.5384[.000]
dDLEXP2	-.55287	.16086	-3.4370[.004]
dDFDI	.5904E-7	.2413E-7	2.4465[.028]
dDGEXH	.1480E-5	.4734E-6	3.1262[.007]
dDGEXH1	-.2514E-5	.9400E-6	-2.6746[.018]
dDAGROP	-.2987E-6	.1966E-6	-1.5193[.151]
dDAGROP1	-.1941E-5	.5619E-6	-3.4549[.004]
dDAGROP2	-.1002E-5	.4844E-6	-2.0686[.058]
dDGDPI	-.1345E-4	.2946E-4	-.45674[.655]
dDGDPI1	.8611E-4	.3477E-4	2.4769[.027]
dDGDPI2	.5524E-4	.2478E-4	2.2290[.043]
dC	-.014755	.0051866	-2.8448[.013]

(continued)

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
ecm(-1)	-.15443	.043223	-3.5729[.003]
R-Squared	.99525	R-Bar-Squared	.98765
S.E. of Regression	.0054938	F-stat. F(12, 14)	174.6145[.000]
Mean of Dependent Variable	.014040	S.D. of Dependent Variable	.049437
Residual Sum of Squares	.3018E-3	Equation Log-likelihood	115.6090
Akaike Info. Criterion	98.6090	Schwarz Bayesian Criterion	87.5944
DW-statistic	2.6526		



CONCLUSIONS AND RECOMMENDATIONS

The study so far, undertakes a sound analysis of the contributions of FDI to poverty reduction in Nigeria using monetary (GDP by Income (GDPI)) and non-monetary (life expectancy (LEXP)) indicators as proxies for poverty reduction from 1980 to 2010 respectively. The study uses residual unit root test for cointegration test and the ARDL error correction modeling to investigate the long-run and short-run relationships respectively. Results of the poverty models were very profound and revealing. The study shows the existence of long run and short run relationships in both models. The most important and consistent variables contributing to poverty reduction are foreign direct investment (FDI), government expenditure on education and health when GDPI and LEXP were applied separately. Indeed, the significant contribution of FDI to poverty reduction validates the objective of the study. Government expenditure on health, education and agriculture coupled with agricultural output prove quite promising in contributing to poverty reduction. It is imperative however to introduce policies to improve drastically government expenditure on health, education and agriculture; and also facilitate infrastructural development in the agricultural sector (heavily dominated by the poor) in order to boost the growth of GDP by income which will eventually translate to poverty reduction. Accelerating the attraction of foreign direct investment is a well-known strategy for creating employment and

reducing poverty. Finally, by way of recommendation, it is therefore imperative for government to improve infrastructure by building and developing transportation system, boosting the availability of electricity and institutional reforms complemented by favourable and sustainable macroeconomic environment. Attraction of FDI will not only contribute to a more sustainable growth of GDP by income but also enhance employment creation and promote poverty reduction. The most important finding of the study is the positive and significant contribution of FDI to poverty reduction in Nigeria in the period covered by the study.

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