Relationship between Foreign Direct Investment and Per Capita GDP in Nigeria- An Empirical Analysis (1980-2009)

Z. T. ABDALLAH, PhD
Department of Economics
Kaduna State University
Kaduna State, Nigeria.
Email: zubairutajo@yahoo.com

ABUBAKAR ABDULLAHI
Department of Economics
Kaduna State University
Kaduna State, Nigeria.
Email: abukarba599@yahoo.com

Abstract

The role of investment has been widely recognized in economic growth process. However domestic investment, especially in developing countries, is usually insufficient to spur growth. Developing countries have therefore embarked on conscious efforts at attracting foreign investments to fill the gaps between domestic and desired investments. This study investigates the relationship between FDI and per capita GDP in Nigeria using a VECM structure. The result reveals the absence of short run causal relationship between FDI and per capita GDP. it also reveals that FDI negatively affects per capita GDP in the long run in Nigeria.

Keywords: FDI; Per Capita GDP; Vector Error Correction; Nigeria.

1. Introduction

Development economists have recognized the importance of investment to the process of economic growth[1]. It is argued that poverty and low income levels among other factors retard investment spending which as a result affect economic growth adversely[2]. Developing countries, in recent times, have embarked on conscious efforts aimed at attracting foreign direct investment (hereafter FDI). This is done in an attempt to address the problem of shortage of investment funds and to narrow the gap between domestic investment and the desired investment needed for targeted growth. For instance, inflow of FDI to Nigeria from 2003 to 2006 has been very impressive. In 2003, the value of FDI to Nigeria stood at $2.23billion. It rose to $5.31 billion in 2004 (representing a 138 per cent increase) and further jumped to $9.92billion in 2005 (denoting an 87 per cent rise) before finally declining marginally to $9.44billion in 2006[3]. The United Nations Conference on Trade and Development[4] reports that Nigeria is Africa's second top FDI recipient after Angola in the period 2001 to 2002.

FDI inflow to Nigeria has been on the rise for the past two decades[5], yet its impact on economic growth is still not well pronounced. The argument that FDI augments total domestic investment by reducing the gap between desired and domestic investment, is based on the belief that it increases revenue, improves management, fosters technological transfer/progress and skilled manpower development. But there is no clear evidence that this is so in the case of Nigeria. Again, evidence on the role of FDI on economic growth is mixed.

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Although it is posited that the relationship between them is positive[6], the cost of FDI may at times be potentially huge and thus outweigh its gains[7]. These costs in the case of Nigeria may include corruption, reduced transparency, repatriation of short term profit, unemployment, as well as unwarranted concession given to Multi National Corporations. These among other factors necessitate the call to re-examine the nexus between FDI and economic growth, especially in Nigeria. Thus, this study investigates the relationship between FDI and per capita GDP in Nigeria. Its significance is based on its potential contribution to the body of literature on FDI-growth studies. First, there is only a handful of studies on FDI-growth relationship in Nigeria. Second, most previous studies on FDI-growth relationship are cross sectional or panel data studies. Available evidences however suggest that the effect of FDI on growth may be country specific[8], hence the potential importance of this paper.

2. Literature Review

Discourse on the impact of FDI on economic growth is at best contentious. While some empirical studies indicate positive link between FDI and economic growth, others suggest the relationship is insignificant in Nigeria or worse, negative. For instance, Yauri[9], Ayanwale[10], and Ozturk[11] argue that FDI affects economic growth positively. They contend that FDI may promote growth through technological transfer and by filling the gap between actual domestic and desired investments.

On the other hand, Seetenaah and Khadaro[12], Ramires[13], Adelegan[14] find that FDI affects growth negatively. They argue that FDI may dampen growth if the profits of Multi National Corporations (MNCs) are repatriated or if MNCs enjoy substantial concessions. They also suggest that most often than not, MNCs in developing countries tend to operate in imperfectly competitive sectors of the economy which may result in crowding out domestic saving and investment. In addition, Ayanwale[15] states that MNCs may prevent the transfer of technology to affiliate firms if their operations negate the profit maximization goal.

A number of motivating factors contribute to the flow of FDI into host countries. Farrel et al[16], Hsiao and Shen[17], Garibaldi et al[18] and Development Business Reports[19] have provided evidences which suggest that market size, political and macroeconomic stability, economic growth, conducive/strong regulatory framework, financial openness and investment opportunities as important factors that attract FDI into host countries.

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3. Methodology

Solow's growth model has explicitly stated the importance of investments in economic growth process[20]. More so, the role of technological progress has been clearly stated as an important driver of economic growth in the model. It is argued that FDI not only augments domestic investment, but also embodies technologies necessary for growth. Owing to these facts, we thus adopt Solow's growth model as our theoretical framework. Following Solow's augmented production function, in which output is a function of stock of capital, labour, human capital, and productivity, we may present the functional relationship as follows

$$Y= f(AKLH) \quad (1)$$

Where; A denotes productivity, *K* represents capital stock, *L* stands for labour force, and *H* is human capital. The stock of capital is assumed to consist of domestic and foreign capital stock as shown below

$$K_t= K_{dt} + K_{ft} \quad (2)$$

Where; K_{dt} and K_{ft} denote domestic capital stock and foreign capital stock respectively. Substituting these into the growth equation, we have

$$Y_t= A_t K^{\alpha}_{dt} K^{\beta}_{ft} L^{\gamma}_t H^{\lambda}_t \quad (3)$$

Where; *Y* equals output, *A* represents total factor productivity, K_d denotes domestic capital stock, K_f stands for foreign capital stock, *L* represents labour force, and *H* denotes human skill. The subscript *t* denotes time period. It should be noted that K^{α}_{dt} *and* K^{β}_{ft} are specified in Cobb Douglas production function form so that $\alpha + \beta = 1$. Taking the log and differentiating equation 3 with respect to time, we obtain the following growth equation;

$$Y_t= a_t + \alpha K_{dt} + \beta K_{ft} + \gamma L_t + \lambda H_t \quad (4)$$

The elasticity coefficients ($\alpha,\beta,\gamma,\lambda$) are interpreted as respective shares of factor inputs to total output.

3.1 Model Specification

In this study, output is denoted by *Y*, which is a function of foreign direct investment denoted as *FDI*, human capital as *HC*, domestic investment as *DI*, growth rate of labour force as *LAB* and openness to trade as *OPEN* respectively. Thus, we may represent the relationship between growth of output and *FDI* in Nigeria as follows:

$$Y= f(FDI,HC,DI,LAB,OPEN)$$

Transforming this functional representation of the growth equation into an econometric model, we have;

$$Y_t= FDI_t + DI_t + HC_t + LAB_t + OPEN_t + \varepsilon_t \quad (5)$$

Taking the log of equation *(5)* above, we have;

$$lY_t= lFDI_t + lDI_t + lHC_t + lLAB_t + lOPEN_t + \varepsilon_t \quad (6)$$

3.2 Method of Estimation

The research utilizes Vector Error Correction Model as our method of estimation. The strength of this method, which is a system of equation model, is that it treats all variables as potentially endogenous. This helps to address the problem of endogenuity in our model. The model has two components: the first is the short run, which basically measures short run Granger Causality among the variables. The second part of the model is the long run component. This is the part of the model that measures the long run equilibrium relationship among the variables. The coefficient of the error correction term measures the speed of adjustment. In other words, it tells us how long it will take to correct any disequilibrium in the long run. The use of this model is contingent upon two criteria: first, all variables are non-stationary in level but stationary in first difference (unit root test). Second, there must exist at least or more long run co-integrating relationships among the variables (Co-integration test). In testing for the Unit root, Augmented Dickey Fuller and Phillips Perron Test statistics are employed while Trace and Max Eigen Value test statistics are used to test for the presence of Long Run Co-integrating relationship among the variables. This method of estimation was used in Akinlo[21] and Kabara[22].

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3.3 Data

This paper uses annual data from 1980 to 2009. Per Capita GDP is measured as real GDP divided by total population. Domestic investment is proxied by expenditure on capital project. FDI is measured by the net inflow of FDI. Human Capital is proxied by expenditure on education. Labour force is denoted by the growth rate of the labour force and Openness to trade is measured as the ratio of exports plus imports to real GDP. Data on domestic investment and human capital are obtained from Central Bank of Nigeria[23] while data on Per Capita GDP, FDI, Labour, and trade openness are extracted from World Bank's World Development Indicators database.

4.1 Discussion of Results

$$lnrgdpl = 106.8065 + 0.65508 lnfdi + 0.1102 lnhc - 0.3118 lndi - 0.1063 lnlab + 1.8091 lnopen \quad (7)$$
$$[7.9545] \quad [1.9427] \quad [-2.9095] \quad [-9.6813] \quad [4.2986]$$

Equation 7 shows the long run equilibrium relationship. We find FDI and trade openness to negatively affect Per Capita GDP. On the other hand, we find labour force and domestic investment to impact on growth positively. Lastly, expenditure on human capital is found to be insignificant to economic growth or Per Capita GDP.
Table 1 in appendix 1 shows the result of the unit root test. The result also shows that all variables are integrated of order 1. This means that all the variables are non-stationary in level but are stationary in the first difference.
Table 2 in appendix 2 shows the result of Co-integration tests. The table reveals the existence of 2 Co-integrating equations. Both Trace test and Max Eigen Value test confirm the existence of 2 Co-integrating equations. This implies that there is long run equilibrium relationship amongst the variables.

Table 3 in appendix 3 presents the result of short run Granger Causality based on VECM and the error correction term. The result revealed that there is no short run causal relationship between FDI and economic growth, but the coefficient of the error correction term is found to be significant. Also, we do not find short run causal link between the other variables and economic growth. Finally, the result shows that real GDP per capita and FDI to granger cause the growth of labour force in the short run.

4.2 Analysis of Results

The result of our study reveals both theoretical and empirical evidences that defined the relationship between FDI and economic growth consistent with the contemporary socio-economic realities of Nigeria. First, the absence of short run causal relationship between FDI and economic growth is not surprising, as the effect of FDI on growth may take longer time period to manifest. The finding is consistent with the work of Akinlo[24].

Second, the finding that FDI negatively impacts on economic growth is rather expected especially in the case of Nigeria. This is so because FDI in Nigeria usually takes the form of "Hot Money", which is basically intended for short term profit. This kind of investment promotes volatility and may affect growth negatively. This result is also in line with Sateenah and Khadaroo[25].

Third, the negative relationship between openness and growth makes economic sense given the fact that Nigeria is a major importer of finished products and it hardly exports any. This trade imbalance normally affects employment and current account balance adversely. It may ultimately impede the growth process.

Furthermore, the findings of a significant and positive nexus between domestic investment and growth on one the hand and between labour force and economic growth on the other are well rooted in economic theory. Investment is an important and very volatile determinant of growth. Domestic investment may be channeled to growth sensitive and growth promoting sectors, thereby fostering rapid economic growth.

Finally, the insignificant relationship between expenditure on human capital and economic growth is consistent with the scenario in Nigeria. This may imply that expenditure on education is not sufficient to promote growth because adequate funds are not available for research and development which are necessary for growth.

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It may also explain the existence of the insignificant effect of expenditure on human capital relative to economic growth in Nigeria.

5. Summary and Conclusion

Investment has been identified as an important factor necessary for growth. Poverty and low income levels however, are among other factors militating against the supply of needed funds for domestic investment, especially in developing countries. In an effort to reduce the gap between domestic investment and desired investment, most developing nations have embarked on policy actions aimed at promoting the flow of FDI into their countries. The inflow of FDI to Nigeria in particular has been very impressive; yet, the benefits of FDI on growth are yet to be noticed. This study investigates the impact of FDI on Per Capita GDP in Nigeria using a VECM structure. The result shows that there is no short run causal relationship between FDI and economic growth. In the long run, we find FDI to negatively affect economic growth. This may be due to the huge concessions given to MNCs at the detriment of the nation; such concessions may include long tax holidays. Again, the goal of most MNCs is to maximize short term profit which is repatriated back to their home economies, instead of being re-invested in the host country.

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Appendix

Appendix 1

Table 1: The Result of Unit Root Test

variables	ADF		PP	
	level	First difference	Level	First difference
lrgdpc	-0.05 (0.91)	-4.17** (0.03)	-0.55 (0.90)	-4.97*** (0.001)
lfdi	-2.69 (0.15)	-8.76*** (0.004)	-2.63 (0.34)	-8.76*** (0.003)
lhc	-2.99 (0.21)	-8.48*** (.001)	-3.62 (0.25)	-8.48*** (0.001)
llab	-1.89 (0.54)	-4.52*** (0.001)	-2.22 (0.11)	-3.53*** (0.001)
ldi	-0.86 (0.73)	-5.44*** (0.002)	-0.54 (0.41)	-5.44*** (0.003)
lopen	-2.71 (0.19)	-7.14*** (0.001)	-2.71 (0.17)	-7.15*** (0.002)

Note: lrgdc denotes log of real GDP per capita, lfdi denotes log of FDI, lhc denotes log of human capital, llab denotes log of the growth rate of labour force, ldi denotes log of domestic investment, lopen denotes log of trade openness. ADF and PP denotes Augmented Dickey Fuller and Philip Perron test statistics respectively. Lag length selection is based on Schwarz Information Criterion. Intercept and trend are included in the model. The value in parenthesis represents P-value. ** and *** implies significance at 5 and 1 per cents respectively.

Appendix 2

Table 4.2 : Johansen-Juselius Cointegration Test

HYPOTHESIZED NO OF CE(S)	TEST		CRITICAL VALUE (5%)	
	Trace Statistics	Max-Eigen Statistics	Trace Statistics	Max-Eigen Statistics
NONE*	108.0918*	48.0899*	95.7537	40.7757
AT MOST 1*	70.0020*	35.4629*	69.8189	33.8769
AT MOST 2	47.5390	18.6051	47.8561	27.5843
AT MOST 3	28.9340	12.2097	29.7971	21.1316
AT MOST 4	16.7242	10.3392	15.4947	14.2646
AT MOST 5	6.3850	6.3850	3.8415	3.8415

Appendix 3

Table 3: Granger Causality Results Based On Vecm

DEPENDENT VARIABLES	INDEPENDENT VARIABLES χ^{2}- STATISTICS						ECT_t (t-statistic)
	ΔLNRGDPL	ΔLNFDI	ΔLNHC	ΔLNDI	ΔLNLAB	ΔLNOPEN	
ΔLNGDPL	-	1.4450 (0.4855)	3.2383 (0.1981)	1.0575 (0.5910)	9.0710 (0.0107)	0.2059 (0.9022)	-0.1017** [-2.3104]
ΔLNFDI	1.5482 (0.4611)	-	3.3859 (0.1840)	0.5882 (0.7452)	1.8022 (0.4061)	0.4196 (0.8108)	0.6118 [1.6180]
ΔLNHC	1.5185 (0.4680)	0.4975 (0.7798)	-	0.6463 (0.7239)	2.9035 (0.2342)	0.7724 (0.6796)	-0.0701 [-1.5455]
ΔLNDI	1.7655 (0.4136)	1.8077 (0.4050)	0.9668 (0.6167)	-	0.1720 (0.9176)	0.1444 (0.9303)	-0.0163 [-0.05004]
ΔLNLAB	6.6821 (0.0354)**	7.0361 (0.0297)**	0.0610 (0.9699)	2.0769 (0.3540)	-	0.0942 (0.9540)	-0.0030** [-2.6428]
ΔLNOPEN	3.5984 (0.1654)	0.1508 (0.9274)	0.2073 (0.9015)	3.0249 (0.2204)	0.5574 (0.7568)	-	0.0599 [0.56750]

Notes: ** denotes significant at 5% siginificant level respectively
( ) Figures in bracket indicates the p-values
[ ] Figures in bracket indicates the t-stats