Unit Root Test of Foreign Direct Investment and Economic Growth of Nigeria

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ABSTRACT

By bridging the gap between domestic savings and domestic investment needs, and bringing the latest technology and management know-how from developed countries, Foreign Direct Investment (FDI) can play a vital role in bringing about rapid economic growth in developing countries like Nigeria. Secondary time series data sourced from National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) Statistical Bulletin were used and Unit Root Test (URT) was adopted for analysis. The results from the findings show that Credit to Private Sector, Net Export and Real Gross Domestic Product (RGDP) are positively and significantly related to FDI in later years. The researchers therefore recommend that government through her Monetary Authorities should initiate policies that will make it easier for private sector operators to access funds for their investments without too much conditionality, encourage production and consequently exports of goods and services.

Keywords: FDI, RGDP, Net Export, Credit to Private Sector, Unit Root Test

INTRODUCTION

Economists who have studied growth have found that the engine of economic growth and progress must ride on four wheels, no matter how rich or poor the economy. These four wheels or factors of growth are: Human resources (labour supply, education, motivation and discipline), Natural resources (Land, mineral, and environmental quality), Capital formation (Machines, factories, and roads) and Technology (Science, engineering, management, and entrepreneurship) (Samuelson and Nordhaus, 2005). Similarly, growth, in the view of the neo-classical economists, is brought about by increase in the quantity and quality of factors of production as well as the efficiency of their allocation and utilization (Oyeranti, 2003). In other words, increase in the capital stock, advances in technology and improvement in the quality and level of literacy are considered the pivot upon which economic growth rotate. In recent years, however, the idea of sustainable development has brought in additional factors such as environmentally sound processes that must be taken into account in growing an economy. A quick look at the make-up of the above prerequisites would clearly show that Nigeria can hardly be said to possess any of them in such quantity and quality that can engender growth.

Foreign Direct Investments (FDIs) which have been seen as investments made to acquire a lasting management interest (normally not less than 10% of voting stock) by a company or an entity based in one country, into another company or entity based in another country (where foreign is defined according to residency and not according to nationality), (World Bank, 1996). Some of the essential attributes of FDI which it carries and deposits where ever it goes include: release of the binding constraint on domestic savings; transfer of technology; increase in export as a result of increased capacity and competitiveness in domestic production; financial sector development; infrastructural development; institutional development and development in absorptive capacity, via, human capital, trade regime and degree of openness (Borenstein, De Gregorio and Lee, 1998; Ajayi, 2003; and Kamara, 2013).

Drawing a parallel between the essential attributes of FDI as highlighted above and the

ingredients/pre-requisites of growth as similarly highlighted above, it is obvious that FDI must be a tool for growth if well managed and harnessed. FDI is unequivocally good for growth and development as long as the investors do not pollute the environment or blatantly abuse workers, and the more FDI host countries can attract the better (Williamson, 2003; and Morgan, 2005).

The remaining of this paper includes literature review, the materials and methods, results and discussions and finally the conclusion and recommendation.

LITERATURE REVIEW Concept and Meaning of FDI

Foreign Direct Investment (FDI) as already described above is an investment made to acquire a lasting management interest (normally not less than 10% of voting stock) by a company or entity based in one country, into another company or entity based in another country (where foreign is defined according to residency and not according to nationality) (World Bank, 1996; Anyawale, 2007; and Obadan, 2004).

By way of example, if a Nigerian national resident in the United Kingdom decides to come to Nigeria to set up a manufacturing outfit, such an outfit would qualify to be described as an FDI, according to the World Bank, (1996). This is not withstanding that the investor is a Nigerian national. Similarly, if an American national resident in Ghana decides to invest in USA, such investment would be described as an FDI inflow to the United States, notwithstanding that the investment was made by an American national. On the other hand, if a Nigerian resident in Nigeria (say Igbo, resident in the South Eastern part of the country) decides to go to Sambisa forest in the North-Eastern part of the country to open up a meat or tomatoes processing plant, such would not qualify as an FDI inflow to Nigeria, whether the investment was a green field or Merger and acquisition type and no matter the size of the investment.

FDI is particularly important to Nigerian environment not only because it is a package of tangible and intangible assets, but also because firms deploying them are important players in the global economy. There is, for example, considerable evidence that FDI can affect positively, growth and development through complementing domestic investment and by facilitating trade and transfer of knowledge and technology (Ajayi, 2006). There is also the argument that developed countries have continued to tighten their budget, following the 2008 global economic crises, leading to a leveling off and in some cases a decline in development aid and lending from these countries. In addition, developing countries, including Nigeria, are savings deficient. This leaves Private Foreign Capital, of which FDI is a significant part, as the major source of capital for investment and consequently growth.

FDI differ substantially from indirect investments such as portfolio flows, wherein overseas institutions invest in equities on a nation's stock exchange merely for income and not for control, a distinguishing feature of FDI. Expectedly, most developing countries prefer FDI to other forms of private capital because of its very nature. It proves to be relatively stable and less sensitive/vulnerable to economic fluctuations compared to portfolio investments which many consider as 'hot money' and which many also belief, for instance, to have triggered the Asian crises

of 1997 (Kamara, 2013). FDI is "bolted" and the perception of most policy makers is that it engenders economic growth through job creation, technology transfer and consequently increased productivity.

FDI is seen as "a key driver of economic growth and development. Most governments, therefore, consider attracting FDI as priority, particularly in developing and transition economies. It is given this emphasis not just because it boosts capital formation, but also because it can enhance the quality of the capital stock".

Rational for FDI

Foreign Direct Investment is a two-way flow, inflow and outflow. Its rationale is equally two-way dimensional, recognizing the fact that two sets of interests are involved: interest of the foreign investor, and that of the host country.

Beginning with the outflow and from the point of view of the foreign investor, World Bank (1997) observed that both domestic and international structural forces were driving private investment to developing countries since the early 1990s. In industrial countries, the primary forces revolve around the search for higher return as well as an avenue to diversify their risk at home. Two other key developments in industrial countries reinforce the desire of foreign investors to look outwardly. First, competition and rising costs in domestic markets, along with falling transport and communication costs encouraged foreign firms to look for opportunities to increase efficiency and returns (that is profits) by producing abroad.

From the perspective of the host country, FDI inflow will help to transfer the requisite technological skill as well as the provision of the right training and management skill to local workers. FDI embodies advanced technology as well as production know-how and techniques, which firms would bring with them when they invest in a country. It is also envisioned that FDI will encourage innovation and spin-offs. It will also enhance the productivity of the local workforce and domestic industries (OECD, 1995).

Theories of Foreign Direct Investment (FDI)

There are many models and theories that have been used to explain the evolution of FDI as well as its effect on economic growth. The selected few of such theories includes Development Theory, Neo-classical Microeconomic (Interest Rate) Theory and Kojima Theory.

The Development Theory

This shows the many ways in which FDI could contribute to the economic growth of a host country. In the first place, there is the release from the limiting constraint of the domestic savings through foreign capital inflows. In this connection, FDI augments domestic savings in the process of capital accumulation. Savings done in a distant environment are brought into the host country through the vehicle of FDI. According to Ajayi (2006), FDI, in that situation, helps to stimulate domestic investment, hence the enhancement of total investment in the country. Additionally, FDI engenders externalities in the form of technology transfer and spillovers (Carkovic and Levine, 2002).

Obviously, by bringing new knowledge and investments in physical and human infrastructure in the form of roads, factories and human capital, foreign investors may help to reduce what Romer (1993) referred to as "Idea Gap between the developed and the developing countries (Adams, 2009).

Neo-classical Microeconomic (Interest Rate) Theory

This theory which was used to explain the reasons for FDI inflows until the 1960s is yet another theory reviewed in this study (Dunning, 1993). According to this theory, capital movements are caused by differences in interest rates that exist between countries. From the point of view of this theory, capital is a commodity which price, in the form of interest rate, determines its supply and demand (Aggarwal, 1984). The commodity (capital) thus flows from countries with excess supply and consequently low price (low rate of interest) to countries with relatively low supply and consequently high interest rates under conditions of perfect competition. This has in recent times played out in Nigeria with the monetary authorities refusing to bring down interest rate, all in the bid to attract foreign capital.

The Kojima Theory.

One of the first theories on FDI from Asian developed countries was put forward by Kojima (Kojima, 1973, 1975 and 1985) mainly with regard to FDI outflow from Japan. He contended that the inability of some firms to effectively compete in Japan compelled such firms to look for investment opportunities abroad. He was of the opinion that the more efficient local firms were pushing the less competent firms out of the local markets. Consequently, the weaker firms were moving overseas, especially to other developing countries.

Even though there are some examples of international investments that verify and validate Kojima's assumption of inability of firms to compete locally, which leads them to invest abroad, typical example of which is the Suzuki Motors Corporation (SMC) of Japan which relocated its plant to India as it was unable to compete with other automobile firms such as Toyota Motors in the domestic market. It may still not be satisfactory to generalize this proposition. Typically, Kojima's hypothesis failed to explain the expansion of business activities in international markets by the locally competent firms. Again a good example is the Toyota Company of Japan cited above, which though was well entrenched in the Japan automobile domestic market, still set up a base in India to take advantage of the liberal automobile and FDI policies (Nayak and Choudhury, 2014).

Selected Empirical Studies on FDI

Presented in Table 1 below are some selected studies that have been widely used in the literature of FDI.

Determinants of FDI	Positive	Negative	Insignificant
Real GDP per capita	Schneider & Frey (1985), Tsai (1994), Lipsey (1999)	Edward (1990) Jaspersen, Aylward and Knox (2000)	Loree and Guisinger (1995), Hausmann and Ferdnandez Arias (2000)
Openness (NE)	Edward (1990), Gastanaga et al (1998), Hausmann and Fernandez (2000)	-	-
Credit to Private Sector	Okorie and Chikwendu (2019)		

Table 1: Selected Empirical Studies on FDI

Source: Researchers' Compilation, 2023.

As is evident from table 1, the FDI growth empirical literature gives ambiguous findings and results. While Schneider & Frey (1985), Tsai (1994) and Lipsey (1999) found that Real GDP per capita and FDI positively correlated, Edward (1990), Jaspersen, Aylward and knox (2000) found them negatively correlated. In other words, to Edward and Jaspersen et al, Real GDP per capita does not exert any influence at all on FDI. On the other hand, for Loree and Guisinger (1995), and Hausmann and Ferdnandez-Arias (2000), the impact of Real GDP per capita is rather insignificant.

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Edward (1990), Gastanaga et al (1998), and Hausmann and Fernandez-Arias (2000) found that Openness (NE) and FDI positively correlated

Okorie and Chikwendu (2019) examined the impact of private sector credit on private sector investment in Nigeria using the ARDL approach between the periods1986-2018. The variables used are private sector credit, real interest rate, external debt and real gross domestic product. The result showed that private sector credit has positive and significant impact on private sector investment in the short-run, but in the long-run, private sector credit has positive and insignificant impact on private sector investment in Nigeria.

METHODOLGY

Systematic time series econometrics approach is used to analyze the impact of Foreign Direct Investment (FDI) on economic growth of Nigeria during the study period. Unit root test, Cointegration test, and Error correction model (ECM) were used to verify the stationarity of the variables, determine the number of Cointegration equations among the variables and check the speed of adjustment from short-run to long-run equilibrium.

The model is specified in the functional form as follows:

FDI = f(RGDP, NE, CPS)(1)

The functional transformation of the model is thus: $FDI = f(RGDP, NE, CPS) + \mu$ (2)

Therefore, the mathematical form of the model is thus: $FDI = b_0 + b_1RGDP + b_2NE + b_3CPS + \mu$ (3) Where:

FDI = Foreign Direct Investment RGDP = Real Gross Domestic Product NE = Net Export CPS = Credit to Private Sector b_0 = Constant b_1 , b_2 , and b_3 are parameters. μ = Error term

The re-specification of the model so as to include an error correction term (ECT) is thus: $\Delta FDI = b_0 + b_1 \Delta RGDP_{t-1} + b_2 \Delta NE_{t-1} + b_3 \Delta CPS_{t-1} + b_4 ECT_{t-1} + \mu_t.....(4)$ Where ECT = Error Correction Term.

RESULTS AND DISCUSSION

This part covers the Unit Root test result, Cointegration test result, Error Correction Term result and discussion.

i. Unit Root Test

Unit root test is a test to determine the suitability of the variables for a time series regression. This test is necessary because most economic time series have proved empirically to be non-stationary in nature. In other to achieve this, Augmented Dickey-Fuller (ADF) was adopted.

Variables	Lag	Critical	ADF test	Status	Remarks
		Value at	Statistic		
		5%	Value		
FDI	1	-2.957110	-3.475924	1(1)	Stationary
RGDP	1	-2.957110	-4.068976	1(1)	Stationary
NE	1	-2.967767	-15.69410	1(1)	Stationary
CPS	1	-2.957110	-3.757007	1(1)	Stationary

Table 2: Augmented Dickey-Fuller (ADF) Unit Root Test

Source: Researchers' Computation, 2023.

From the above table, the ADF test Statistic Values of all the series are more negative than their 5 percent Critical Value at the various differencing levels. This shows that the model follows integrating process because they are all integrated of the same order.

ii. Cointegration Test Result

This test is conducted to determine the existence of a long-run equilibrium relationship among the variables in the model. The results of the test are as summarized hereunder.

Table 5: Connegration Test					
Rank	Trace statistics	5% critical value			
FDI	162.1164	68.52*			
RGDP	60.98970	47.21*			
NE	20.94220	29.68			
CPS	6.888142	15.41			

Table 3. Cointegration Test

Source: Researchers' Computation, 2023.

*(**) denotes rejection of the hypothesis at the 5% (1%) level

Trace test indicates 2 cointegrating equation(s) at both 5% and 1% levels

The result of the Co-integration test presented above indicates two co-integration equations at 5% level of significance for the model. The result therefore confirms the existence of Cointegration among the variables.

iii. Error Correction Term Result

This test is conducted to check the speed of adjustment from short-run to long-run equilibrium using parsimonious error correction term result.

Table 4: Parsimonious Result of the Error Correction Term

Dependent Variable (FDI) Mat Least Squares Date 12/10/23 Time 0051. Sample (adjusted) 1980 2019 Included conservations 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI)(-1)	-0.127657	0.280790	-0.4544635	0.6569
D(CPS(-1))	-4652.451	5174.013	-0.899196	0.3849
D(CPS(-2)	-4784.525	4616.315	-1.036343	0.3189
D(CPS(-3))	-3780.087	4841.130	-0.780918	0.4488
D(CPS(-4)	19932.38	5286.275	3.770544	0.0023
D(CPS(-5))	15727.38	4174.600	3.767399	0.0023
D(NETEXPORT(-2))	-0.031859	0.028577	-1.114846	0.2851
D(NETEXPORT(-4))	0.124427	0.029522	4.214681	0.0010
D(RGDP(-1))	-0.016539	0.017835	-0.927305	0.3707
D(RGDP(-3))	0.087947	0.020622	4.264724	0.0009
D(RGDP(-4))	0.037339	0.022444	1.663675	0.1201
ECT(-1)	-0.992424	0.292300	-3.395223	0.0048
С	-29199.46	22747.84	-1.283615	0.2217
R-squared	0.935718	Mean dependent var		22973.76
Adjusted R-squared	0.856601	S.D. dependent var		165289.2
S.E. of regression	62591.86	Akaike info criterion		25.22374
Sum squared resid	5.09E+10	Schwarz criterion		26.01776
Log likelihood	-361.3561	Hannan-Quinn criter.		25.47775
F-statistics	11.82703	Durbin Watson Stat		2.374591
Prob (F-statistic)	0.000029			

Source: Researchers' Computation, 2023.

The above table shows the long run impact of the changes of independent variables on the dependent variable measured through the Parsimonious Error Correction Term result.

Credit to private sector is not only positively related to FDI in later years (Lags 4 and 5) of the facilities, but is also significant. This is quite understandable since the investments resulting from the facilities will take some gestation period to mature and begin to yield dividends. The earlier years are the waiting period hence their negative and insignificance as shown in the above table 4.

Net Exports in later years are both significantly and positively related to FDI. This is understandable especially for FDIs that are export oriented.

Real Gross Domestic Product is positive and significant at lag 3, implying that it is a good predictor of FDI.

The Error Correction Term (ECT) is correctly signed and corrects about ninety-nine percent (99%) of short run deviations in the long run. This, in fact, depicts a high speed of adjustment. The overall

regression is highly significant while the DW statistic suggests that the model is not serially correlated.

CONCLUSION

The result of this study shows that in the short run the Real Gross Domestic Product (RGDP) is both positively and significantly related with the Foreign Direct Investment (FDI) while Net Export (NE) is negatively but significantly related to FDI. On the other hand, Credit to Private Sector (CPS) in the short run showed a negative but insignificant relationship with FDI. The Error Correction Term result shows that the Real Gross Domestic Product (RGDP), Net Export (NE) and Credit to Private Sector (CPS) have long run positive and significant impact on the Foreign Direct Investments. The researchers therefore recommend that the government through her Monetary Authorities should initiate policies that will make it easier for private sector operators to access funds for their investments without too much conditionality, encourage production and consequently exports of goods and services.

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