THE DETERMINANTS OF FOREIGN DIRECT INVESTMENT (FDI) INFLOWS IN NIGERIA: A CAUSALITY ANALYSIS ON NIGERIA

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Abstract- The researcher empirically evaluated the determinants of foreign direct investment (FDI) inflows in Nigeria: a causality analysis. The study isolated and analyzed annual data collected through secondary sources, on some relevant variables such as FDI inflows, interest rate, fiscal policy, exchange rate, market size, infrastructure, trade openness and natural resource availability. The data were analyzed using multiple regression, descriptive statistics, Johansen co-integration technique, unit root tests and Pairwise Granger causality tests. The results indicated that FDI inflows were significantly influenced by all the independent variables except monetary policy rate and government fiscal balance. However, the causal relationship was uni-directional, running from exchange rate and infrastructure to FDI inflows which implies that the two independent variables were the principal factors determining the dependent variable. The study therefore, recommends that the other variables (dependent and independent) be further strengthened, to engender competitiveness in the economy.

Keywords- Foreign direct investment, Determinant, Causality

I. INTRODUCTION

Foreign direct investment (FDI) is made to acquire a lasting interest in foreign enterprise with the purpose of having an effective voice in its management. It is a business investment in another country, which often takes the form of setting up local production facilities or the purchase of an existing business (Rutherford, 1992 in Egbo, 2010). Thus, FDI involves the transfer of tangible or intangible assets from one country into another for the purpose of use in that country, to generate wealth under the total or partial control of the owner of the assets.

The United Nations Conference on Trade and Development (UNCTAD) defines FDI as investment in enterprise located in one country but "effectively controlled", by residents of another country, while the Organization for Economic Cooperation and Development (OECD), considers FDI as an "enterprise operating in a country other than the country of residence of the foreign direct investor" (Ndubuisi, 2009). In the context of developing countries such as Nigeria, FDI refers to the inflow of capital and personnel from abroad for investment in the country; where the foreign firm or individual must control a certain amount of shares of domestic firms such as ten or more percent of operating capital (Egbo, 2010).

FDI is the distinctive feature of multinational enterprise; hence a theory of FDI is also a theory of multinational enterprises as an actor in the world economy. Thus, FDI is not simply an international transfer of capital but also the extension of an enterprise from home country to foreign host country.

The objective to seek the highest rate of return on capital tend to be the driving force behind, its free flow across national borders. Although, economic theory points to a positive relationship between foreign direct investment (FDI) and economic growth, the determinants of this positive relationship and direction of causality has continued to generate controversy among scholars. FDI is increasingly an important channel for resource flows between and among the industrialized and developing economies. Benefits discernible from these flows include, technological capacity building, efficiency spillover, increasing job creation, improved managerial skills and productivity.

Given the capital deficient nature of African nations and benefits accruable from these investments, FDI has remained a major concern of developing economics. The enormous increase in FDI flows across countries underscores its importance in stimulating growth especially through investment in infrastructures and developments. Foreign investors are often motivated by self interest which could be political, strategic or economic and rarely on ethical considerations of assisting the host countries in poverty reduction and economic growth.

Nigeria has achieved some appreciable economic growth in recent times and a number of explanations have been adduced for it, such as improvement in economic liberalization, efforts towards diversifying the productive base of the economy and increase in FDI inflow (Ogunleye, 2010). Thus, understanding the factors that determines the flow of FDI, as well as the causal relationship are essential to providing useful information on the measures required to achieve desirable outcome. Magnus and Fosu (2007); Hansen and Rand (2004) in Abu, Obida Wafure and Abdullahi (2010) investigated the causal relationship between FDI and GDP. The results indicated non-existence of causality and bidirectional causality respectively. Also Emrah (2007), Kiiza (2007) Dritsaki et al (2004), Chowdhury and Mavrotas (2005) and Sridharan et al (2009) in Abdus Samad (2009), studied causal relationship between FDI and economic growth and the results revealed non existence of causal relationship. Long run equilibrium relationship, bidirectional as well as uni-directional

relationship running from economic growth to FDI were the result of the study carried out by Looungani and Razin (2001). However, empirical studies on the array of economic variables and direction of causality between the variables remain scanty. Therefore, this paper tried to investigate whether the economic variables used in this study, determines the inflows of FDI and the causal relationship between the dependent and independent variables. This paper is organized as follows: Section one is introduction, while section two contains the review of related literature, section three consists of methodology and data analysis, while section four is on the empirical and discussion of findings, conclusion and recommendations

II. METHODOLOGY AND DATA ANALYSIS

This paper employs the descriptive statistics, multiple regression analysis, Pairwise Granger causality tests, Johansen co–integration techniques and correlation matrix to analyze the relationship between the identified measures of FDI inflows. The econometric model expresses FDI as a function of the seven economic variables studied. Thus, the model is specified as follows:

FDIif = VOP + RGDP + GFB/GDP+ FXR + MPR + ELG + TOP ……. (i)

$LogFDIif = b_0 + b_1VOP + b_2 Log^e RGDP + b_3 GFB/GDP + b_4 Log^e F x R + b_5 MPR + b_6 Log^e X ELG + b_7 TOP$……. (ii)

Aprior: b_1, b_3, b_5, and $b_7 > 0$; and b_2, b_4 and $b_6 < 0$

$Y = F(X_1 X_2)$

Where Y = FDI inflow

X_1 = direct government policy measures (MPR, VOP, GFB/GDP, TOP)

X_2 = Indirect government policy measures (ELG, RGDP and FXR)

On the model:

FDI = Foreign Direct Investment

FXR = Exchange Rate between naira and US dollars

TOP = Degree of Trade Openness measured by Export plus Import divided by GDP

GFB = Government Fiscal Balance - surplus or deficit (proxy for Fiscal Policy)

ELG = Electricity Generated in megawatts per hour (proxy for Infrastructure)

VOP = Volume of Oil Produced in millions of barrels per day (proxy for Natural Resource Availability)

MPR = Monetary Policy Rate (proxy for Interest Rate)

RGDP = Growth Rate in GDP (proxy for Market Size).

The equations above are analyzed using the following analytical techniques. From the normality test carried out, the skewness and kurtosis rates of the variables show that the Jarque-Bera test indicated “not normal distribution” (NN) for FDI inflows, interest rate (MPR) and market size (RGDP) while it indicated “normal distribution” (ND) for natural resource availability (VOP) exchange rate (FXR), fiscal policy (GFB), trade openness (TOP) and infrastructure (ELG). See Appendix A.

The correlation between the dependent and independent variables illustrates positive correlation between FDI inflows and infrastructure (ELG), exchange rate (FXR), trade openness (TOP) and natural resource availability (VOP) as well as negative correlation between FDI inflows and fiscal policy (GFB), interest rate (MPR) and market size (RGDP). See Appendix B.

The Appendix C, result shows that all the variables tested are integrated of order one (1), that is, they became stationary after first differencing. It is necessary that each of the variables must be integrated of the same order and the order of integration must be greater than zero. The multiple regression results indicated significant relationship between FDI and all the variables tested except fiscal policy (GFB) and interest rate (MPR). The Durbin Watson statistic at 2.2384891 illustrates the absence of auto correlation and the adjusted R-squared at 0.891807 is an indication that 89.2% of the total variations in FDI is explained. The F-statistic at 35.14861 and probability of 0.0000 shows that the independent variables jointly have a significant effect on FDI, thus, the model is a good fit. See Appendix D.

In Appendix E, we Investigated for the existence of any unique equilibrium relationship(s) among the stationary variables of the same order of integration. The likelihood ratio test shows the existence of four (4) cointegrating equations of the 5% level of significance. Hence, there are four (4) long run combinations between FDI and the other independent variables. Thus, a long run equilibrium or relationship existing between the dependent and independent variables. The results of the Granger causality tests indicated that infrastructure (ELG) and exchange rate (FXR) granger causes FDI inflows, in a uni-directional form. Again, the results show that FDI inflow does not granger cause all the independent measures used as determinants of FDI inflows.

III. RESULTS AND DISCUSSION

The overall regression model shows that some of the measures used to determine the inflows of FDI, significantly influence the decision of foreign investors. In Appendix A, FDI inflows indicated probability of 0.014, meaning approximately 1.5% which was below 5% and thus, a significant ratio (Koutsoyiannis, 1977). Appendix D, also shows that all the variables are significantly related to FDI inflows except fiscal policy and interest rate. The

adjusted R^2 of 89% and F-statistic of 0.0 indicated that majority of the total variation was explained in the result and the multiple regression model was the best fit. The Durbin-Watson (DW) test shows absence of autocorrelation amongst the variables used.

The study discovered presence of long run equilibrium relationship between the dependent and independent variables. Conclusively, it shows a unidirectional granger causality running from infrastructure (ELG) and exchange rate (FXR) to FDI inflows.

From all indication, interest rate (MPR) has no significant relationship with FDI inflows. Market size (RGDP), fiscal policy (GFB), trade openness (TOP) and natural resource availability (ELG) at one point or another indicated insignificant relationship with FDI inflows. Finally, Granger Causality tests show that infrastructure (ELG) and exchange rate (FXR) have significant uni-directional relationship with FDI inflows running from the two former measures to FDI inflows.

From Appendix D, market size (RGDP) indicated negative but significant relationship with FDI inflows. This implies that increase in market size will bring about decrease in FDI inflows, showing that most FDIs to Africa are vertical or raw material seeking in nature, in response to exploration and extraction of natural resources, for home market. Thus, when there is increase in the host market size, probably to commence consumption of natural resources internally, then vertical FDIs will be forced to leave. This is a typical example of FDI not supporting growth in the host market.

The same explanation could also be given for negative but significant relationship between natural resource availability - VOP and FDI inflows. Thus, it can be deduced that increase in exploration of natural resources, other than petroleum, will bring about decrease in the number of FDI inflows in Nigeria. The inflows of foreign investors to Nigeria are particularly for petroleum exploration. This speaks of the negative effect of petroleum and why petroleum extraction, has not influenced growth in real or manufacturing sectors in Nigeria. It also, explains why a major petroleum producing nation such as Nigeria cannot boast of a functioning refinery.

From Appendix D, also, the negative and insignificant relationship between fiscal policy (GFB), interest rate (MPR) and inflows of FDI , can be attributed to better financial system in the FDIs country of origin, from where they obtain cheaper and efficient financial services. Base on the t-statistic of 5.547027 and probability of 0.0000 for electricity generated (ELG), adequate and functioning infrastructure will be a great boost to FDI inflows in Africa.

From Appendix F, the uni-directional granger causality relationship running from electricity generated (ELG) and exchange rate (FXR) to FDI inflows, reinforced the result obtained in Appendix D. The result of the granger causality tests can be attributed to increased presence of raw material seeking FDIs in Nigeria, that have no significant positive impact on the host economy. This is in agreement with Ewurum, Eboh and Igwe (2010), that between 1975 and 2000 Nigeria has earned $300billion from crude oil export but has nothing to show for it, in terms development in all ramifications and Isu (1987), Egbo (2010).

CONCLUSION AND RECOMMENDATIONS

There is no doubt that policy and economic variables used in the study, play a very crucial role in determining the flows of FDI in Nigeria.

The result obtained, shows that all the variables analyzed but two, have significant influence on determining inflows of FDI in Nigeria .Among the measures used to analyze the inflows of FDI, infrastructure (ELG) and foreign exchange rate (FXR) are principal variables affecting inflows of FDI. This is in agreement with Sanusi (2012)who said, “among the Seven-Point Agenda of Federal Government of Nigeria, powers and infrastructure should be given priority attention due to their tendency to facilitate the attainment of other items in the list”.

Based on the findings of the study, the following conclusions emerged:

1. That the variables analyzed had significant influence on FDI inflows in Nigeria except Monetary Policy Rate (interest rate) and fiscal policy (GFB).
2. That foreign exchange rate (FXR) and infrastructure (ELG) are the principal variables determining inflows of FDI. This was indicated by the coefficient results and outstanding probability of 0.0000 recorded by the two variables.
3. That government fiscal balance (GFB) and interest rate (MPR) had no significant influence on FDI inflows in Nigeria.
4. That granger causality relationship between dependent and independent variables was uni-directional running from infrastructure (ELG) and exchange rate (FXR) to FDI inflows. However, majority of the independent variables shows non-significant causality effect on FDI inflows.

That the capacity to attract FDI inflows in Nigeria, is principally determined and influenced by infrastructure (ELG) and exchange rate (FXR). Also, to a moderate, extent, natural resource availability (VOP), trade openness (TOP) and market size (RGDP) influenced the inflows of FDI

Based on the findings of the study, the following recommendations are made:

1. Foreign exchange policy should be geared towards achieving a realistic rate which would not be volatile in appreciating or depreciating, in order not to negatively affect FDI inflows. Exchange rate should be market driven with regulatory authorities, intervening periodically to ensure control.

2. There is need to deepen the culture of development, maintenance and sustainability of infrastructure in Nigeria. In this regard, educational system and human capital development should be strengthened to make the economy, knowledge based and innovation driven. This is in line with Borensztein, Gregorio and Lee (1995), that a country with highly educated labour force could maximize the benefit of FDI through speedy absorption of foreign knowledge, skills and technology.

3. From the regression result, it was evident that natural resource availability (VOP) market size (RGDP) and trade openness (TOP) have significant influence on inflows of FDI. There is need to further strengthen and enhance the impact of these measures, in order to sustain real growth in the economy.

4. There is need to further strengthen variables such as growth rate in GDP (market size), trade openness (TOP), natural resource availability (VOP), fiscal policy (GFB) and interest rate (MPR) to be among principal determinants of FDI inflows in the country.

Also, Nigeria FDI drive should be patterned in a way that foreign investors can have significant positive causal influence on the independent variables, that is, in a way the causal relationship would be bi-directional.

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Appendix A: Descriptive Statistics - Sample 1982-2012

	FDI	ELG	FXR	GFB	RGDP	TOP	MPR	VOP
Mean	307075.1	1959.757	66.49966	4.598333	27.05706	54.69333	13.35367	711.7363
Median	101622.6	1791.500	21.96860	4.4100.000	23.09511	57.90000	13.50000	731.4500
Maximum	1360308	3268.000	157.5000	11.94000	114.8339	88.20000	26.00000	919.2500
Minimum	264.300	994.6000	0.724100	0.050000	3.338424	21.60000	6.080000	450.9000
Std. Dev	427519.9	634.0258	61.30265	3.470094	24.44000	15.42181	4.164566	123.4531
Skewness	1.295834	0.436602	0.224621	0.473137	1.675254	-0.395517	0.765090	0 .546652
Kurtosis	3.231336	2.170090	1.246508	2.193987	6.707199	2.780877	4.154056	2.488003
Jarque- Bera	8.462828	1.814047	4.095690	1.931363	31.21154	0.842187	4.591623	1.821820
Probability	0.014532	0.403724	0.129013	0.380724	0.000000	0.656329	0.100680	0.402158
Observation	30	30	30	30	30	30	30	30
	NN	ND	ND	ND	NN	ND	NN	ND

Appendix B: Correlation Matrix

	ELG	FDI	FXR	GDP	GFB	MPR	RGDP	TOP	VOP
ELG	1.000000	0.817115	0891378	0.873780	-0.575348	-0189011	-0.061784	0.415167	0.766752
FDI	0.817115	1.000000	0.808593	0.961714	-0.501954	-0.503722	-0.263988	0.190182	0.384275
FXR	0.891378	0.808593	1.000000	0.826827	-0.554301	-0.247274	-0.179706	0.320365	0.726687
GDP	0.873780	0.961714	0.826827	1.000000	-0.494631	-0.479258	-0.232563	0.162087	0.424373
GFB	-0.575348	-0.501954	-0.554301	-0.494631	1.000000	-0.360489	-0.121610	-0.443057	-0.503754
MPR	-0.189011	-0.503722	-0.247274	-0.479258	-0.360489	1.000000	0.300454	0.220526	0.212026
RGDP	-0.061784	-0.263988	-0.179706	-0231563	-0.121610	0.300454	1.000000	0.332919	0.036080
TOP	0.415167	0.190182	0.320365	0.162087	-0.443057	0.220526	0.332919	1.000000	0.673856
VOP	0.766752	0.384275	0.726687	0.424373	-0.503754	0.212026	0.036080	0.573856	1.000000

Appendix C: Augmented Dickey Fuller Unit Root Results summary

Variable	ADF Test Statistic at 1st difference	Order of Integration
FDI	-3.563290	1(1)
RGDP	-6.317306	1(1)
ELG(VEG)	-3.689581	1(1)
FXR	-3.492575	1(1)
GFB	-5.209706	1(1)
MPR	-5.712517	1(1)
TOP	-5.074436	1(1)
VOP	-4.136515	1(1)
Critical Values 1% = -3.6852, 10% = -2.6242 and 5% = -2.9705		

Appendix D: Multiple Regression Results

Dependent Variable FDI

Method: Least Squares

Sample (Adjusted): 1983 2012

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std Error	t-Statistics	Prob.
C	703319.3	240719.7	2.921735	0.0097
RGDP	-3104.419	1299.315	-2.389274	0.0259
ELG	566.8850	102.1962	5.547027	0.0000
FXR	3482.298	1058.731	3.289126	0.0033
GFB	-3549.573	11371.19	-0.312155	0. 7579
MPR	-4951.721	9832.668	-0.503599	0.6195
TOP	7954.846	2685.121	2.962565	0.0072
VOP	-2820.437	547.4016	-5.152409	0.0000
R. squared	0.917923	Mean dependent var		307075.1
Adjusted R-squared	0.891807	S.D dependent var		427519.9
S.E of regression	140622.7	Akaike info criterion		26.76873
Sum squared resid	4.35E+11	Schwarz criterion		27.14238
Tog likelihood	-393.5309	F-statistic		35.14861
Durbin-Watson stat	2.238491	Prob (F-statistic)		0.000000

Appendix E: Result of the Co-integration (Johansen Technique)

Sample: 1982 2012

Included observations: 28

Test assumption: Linear deterministic trend in the data

Series: FDI RGDP ELG FXR GFB MPR TOP VOP

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.964819	295.5922	156.00	168.36	None**
0.951708	201.8692	124.24	133.57	At most 1**
0.784710	117.0154	94.15	103.18	At most 2**
0.700416	74.01388	68.52	76.07	At most 3*
0.459316	40.26378	47.21	54.46	At most 4
0.394100	23.04600	29.68	35.65	At most 5
0.275303	9.016883	15.41	20.04	At most 6
3.01E-05	0.000842	3.76	6.65	At most 7

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

L.R test indicates 4 cointegration equation(s) at 5% significance level

Appendix F: Pairwise Granger Causality Tests

Pairwise Granger Causality Test

Sample: 1982 2012

Lags : 2

Null Hypothesis:	Obs	F-Statistic	Probability
ELG does not Granger Cause FDI	29	4.67306	0.01932
FDI does not Granger Cause ELG		2.40190	0.11198
FXR does not Granger Cause FDI	29	6.25424	0.00651
FDI does not Granger Cause FXR		0.04915	0.95213
GFB does not Granger Cause FDI	29	1.78330	0.18964
FDI does not Granger Cause GFB		0.51022	0.60673
MPR does not Granger Cause FDI	29	0.15306	0.85891
FDI does not Granger Cause MPR		1.88850	0.17311
RGDP does not Granger Cause FDI	28	0.34998	0.7.839
FDI does not Granger Cause RGDP		1.22892	0.31111
TOP does not Granger Cause FDI	29	0.33063	0.72169
FDI does not Granger Cause TOP		0.97483	0.39170
VOP does not Granger Cause FDI	29	2.30932	0.12099
FDI does not Granger Cause VOP		0.35863	0.70231

★★★