

Foreign Direct Investment in Nigeria: Reassessing the Role of Market Size

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Abstract

This paper examines the influence of market size on foreign direct investment to Nigeria for the period 1970 – 2011. It answers the question: do multinational enterprises consider market size in the allocation of their foreign direct investment (FDI) to Nigeria? Unlike similar previous studies on Nigeria, this paper examines market size in terms of economy size and population size. Autoregressive Distributed Lag (ARDL) model and Granger Causality Tests were estimated. The results show that economy size and population size has positive and significant effect on foreign direct investment to Nigeria. Market size also Granger causes FDI to Nigeria. This paper, therefore, concludes that multinational enterprises consider Nigerian market size in the allocation of their foreign direct investment (FDI) to the country.

Keywords: Foreign investment, Market Size, Economy size, Population, ARDL model, Nigeria

1. Introduction

Nigeria and other developing economies in Africa consider foreign direct investment (FDI) as a source of capital for increase in production, income growth, added value, export, employment, and poverty reduction. In addition, foreign investment may influence economic growth through transition of technology, knowledge and know-how, imitation and job training. Previous studies have also shown that FDI affects the recipient country's economic growth through new inputs, new technologies and subsequent spill-overs to domestic firms and through knowledge transfers (Feenstra and Markusen, 1994; De Mello and Sinclair, 1995; Krugman, 1979 as cited in Enu, Havi and Attah-Obeng, 2013). No doubt, foreign direct investment (FDI) plays critical roles of filling capital gaps in developing countries such as Nigeria.

Consequently, it is important to consider the question: how do multinational enterprises decide on the locations of their foreign direct investment (FDI)? A theoretical framework for examining the FDI determinants attributed to Dunning (1977, 1993) as cited in Anyanwu (2011) posits that multinational enterprises investing abroad seek for three types of advantages: Ownership (advantages of property rights/patents, expertise, goodwill and other intangible assets that allow a firm to compete with others in the markets it serves irrespective of the disadvantages of being foreign), Location (advantages that make the destination foreign country a more attractive location in the light of natural resources, labour advantages, trade barriers that restrict imports, gains in trade costs and strategic advantages through intangible assets for foreign direct investment than the others), and Internalization (advantages arise from exploiting imperfections in external markets, including reduction of transaction costs and uncertainty in order to generate knowledge more efficiently as well as the reduction of state-generated imperfections such as foreign exchange controls, tariffs and subsidies) advantages.

Dunning (1993) as cited in Anyanwu (2011) also identified four categories of motives for FDI:

- i. Resource seeking: Seeking to access raw materials, physical infrastructure, and labour force resources.
- ii. Market seeking: Seeking to access the host-country domestic market.
- iii. Efficiency seeking: Seeking to take advantage of lower labour costs, lower raw material costs and other efficiency advantages.
- iv. Strategic-asset seeking: Seeking to access research and development, innovation, and advanced technology.

Based on the above discussion, this paper focuses on the market seeking motives. It answers the question: is market size a determinant of FDI to Nigeria? Therefore, the objective of this study is to ascertain if market size is a significant determinant of foreign direct investment in Nigeria. We examined market size in terms of economy size and population size. Thus, the following hypotheses were tested:

- i. H_0 : Economy size has no significant impact on FDI
- ii. H_0 : Population size has no significant impact on FDI
- iii. H_0 : There is no causal relationship between economy size and FDI
- iv. H_0 : There is no causal relationship between population size and FDI

Several researchers have examined the determinants of FDI to domestic economies. These include Holland, Sass, Benacek and Gronicki (2000) who reviewed previous studies of Eastern and Central Europe, and produced evidence of the importance of growth potential and market size as major factors influencing of foreign direct investment. Others examined the effects of macroeconomic instability and uncertainty, economic size and external debt on foreign private investment inflows to Nigeria (Anyanwu, 1998; and Iyoha, 2001). They show that market size attracts foreign direct investment to Nigeria. These studies on the role of market size in attracting FDI to Nigeria did not consider population as a market factor. Billington (1999) is among the first authors to examine population as a variable in FDI determinants estimation. She uses population density as a determinant of FDI. Thus, this paper re-examines the effects of market size – in terms of economy size and population size – on FDI attraction to Nigeria.

2. Methodology

The theoretical framework adopted in this paper follows the work of Dunning (1993) as cited in Anyanwu (2011). As stated earlier, Dunning (1993) identified four categories of motives for foreign direct investment (FDI). These are resource seeking, market seeking, efficiency seeking, and strategic-asset seeking. This paper examines if FDI to Nigeria is market seeking or otherwise. This could be expressed as follows:

$$FDI = f(\sum X_i, \sum Z_i) \dots\dots\dots 1$$

where X_i is a set market size variables (in this case, economy size measured by Gross Domestic Product [GDP] and population size [popn]); and Z_i is a set of other macroeconomic variables affecting FDI. These other macroeconomic variables affecting FDI which are considered in this study are previous FDI to Nigeria, exchange rate [exc] and economic stability measure by inflation rate [inf] (Dunning, 1993; Billington, 1999; Jaumotte, 2004; and Akin, 2009). The basic model called “market-seeking model”, relates to the stock of FDI received by a country to its domestic market size as well as the other possible determinants of FDI such as described above, is stated below.

$$FDI = \delta FDI_{t-i} + \lambda_1 GDP_t + \lambda_2 Popn_t + \lambda_3 EXC_t + \lambda_4 EXC_t + \mu_i \dots\dots\dots 2$$

where δ , and λ_i are the parameters of the model, and μ_i is the stochastic random term in the model. Equation 2 which is an Autoregressive (AR) model was estimated as an Autoregressive Distributed lag (ARDL) model with 2 as the maximum lag to test the under-stated hypotheses:

- i. H_0 : Economy size has no significant impact on FDI
- ii. H_0 : Population size has no significant impact on FDI

Stationarity Test

According to Ojide and Ogbodo (2015), regressing non-stationary data on one another often lead to spurious result. Thus, to ensure that all the variables are void of seasonal variation, stationarity test was carried out using Phillips-Perron unit root test at 1% level of significant. Following Gujarati (2004), unit root test is specified as stated below:

$$\Delta Y_t = \lambda_1 + \lambda_{2t} + \delta Y_{t-1} + \alpha_1 \sum_{i=1}^m \Delta Y_{t-1} + et \dots\dots\dots 3$$

Where

- Δ = Differences operator
- ΔY_t = The change in the logarithm of the time series.
- ΔY_{t-1} = The lagged values of the dependent variables
- m = chosen to eliminate the autocorrelation

Note that there is evidence of unit root if $\delta = 0$.

Any variable lacking stationarity at its level (that is Zero) integration was differenced till it achieved stationarity. As a result, all the variables were used at their levels of stationarity.

Causality Test

- i. H_0 : There is no causal relationship between economy size and FDI
- ii. H_0 : There is no causal relationship between population size and FDI

To test the above null hypotheses, the following causality equations were estimated:

$$FDI = \pi_0 + \pi_1 FDI_{t-1} + \pi_2 GDP_{t-1} + \pi_3 GDP_{t-2} + \epsilon \dots\dots\dots 5$$

$$GDP = \alpha_0 + \alpha_1 GDP_{t-1} + \alpha_2 FDI_{t-1} + \alpha_3 FDI_{t-2} + \epsilon \dots\dots\dots 6$$

$$FDI = \vartheta_0 + \vartheta_1 FDI_{t-1} + \vartheta_2 Popn_{t-1} + \vartheta_3 Popn_{t-2} + \tau \dots\dots\dots 7$$

$$Popn = \lambda_0 + \lambda_1 Popn_{t-1} + \lambda_2 FDI_{t-1} + \lambda_3 FDI_{t-2} + \gamma \dots \dots 8$$

where: π_i , α_i , ϑ_i , and λ_i are the parameters of the models

ε , ℓ , τ , and γ are Stochastic random terms in the models

Data sources and Description

Virtually all macroeconomic data used in this paper were obtained from the Central Bank of Nigeria, Annual Statistical Bulletin 2013. Net inflow of foreign direct investment (FDI) and population size, however, were obtained from World Bank (2015). Though limited availability of data, this paper examines the period from 1970 to 2011. The basic descriptive statistics of the variables are presented in table 1 below.

Table 1 –
Descriptive Statistics of Variables (1970 – 2011)

	FDI	GDP	EXC	INF	POPN
Mean	1783431515	59387746351	43.84	19.53	102202668
Maximum	8841952784	2.43986E+11	155	73	162470737
Minimum	-738870004	9181769912	1	3	57357275
Std. Dev.	2430719185	60277578347	57.43	16.733	31065308
Observations	42	42	42	42	42

3. Results and Discussion

The ARDL and the causality models were estimated using Eview 7. These are discussed in turn below.

Stationarity Test (Unit Root Test)

As stated, stationarity test was conducted using Phillips-Perron unit root test. Results of the tests are presented in table 2. All the macroeconomic variables became stationary at order 1 apart from gross domestic product (GDP) which became stationary at order 2.

Table 2 –
Augmented Dickey-Fuller Unit Root Test: 1970 – 2011

Variable	Critical value (5%)	Adj. t-Stat	Order of Integration
FDI	-3.610453	-8.197287*	I(1)
GDP	-3.610453	-15.70091*	I(2)
EXC	-3.605593	-5.877610*	I(1)
INF	-3.610453	-6.495037*	I(1)

*significant at 1 percent level

Co-integration Test

Equation (2) was tested for co-integration using the variables (exchange rate and inflation rate) that have the same order of integration with the endogenous variable (FDI). As indicated in table 3, both exchange rate and inflation rate are co-integrated with FDI.

Table 3 –

Co-integration Test using Johansen Co-integration Test

Sample (adjusted): 1973 2011				
Included observations: 39 after adjustments				
Trend assumption: Linear deterministic trend				
Series: D(FDI) D(EXC) D(INF)				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.557626	66.84446	29.79707	0.0000
At most 1 *	0.421509	35.03607	15.49471	0.0000
At most 2 *	0.296037	13.69015	3.841466	0.0002
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

These variables were further subjected to co-integration test using residual from their estimation as recommended by Gujarati (2004). This test also confirmed evidence of co-integration in the model. This co-integration problem, however, was corrected by the introduction of error correction mechanism (ecm) in the ARDL model.

Presentation and Evaluation of ARDL Model

Table 4 –

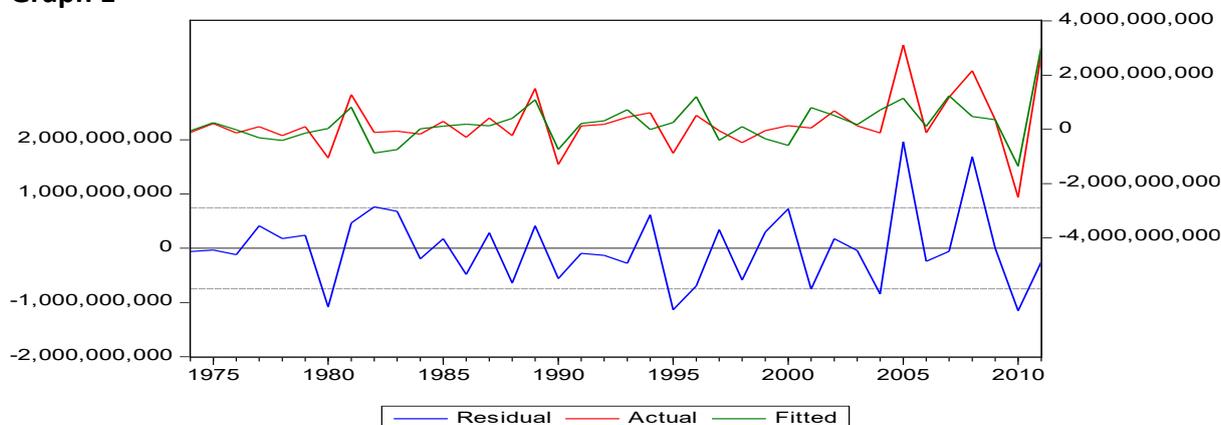
Autoregressive Distributed Lag Model

Dependent Variable: D(FDI)				
Method: Least Squares				
Sample (adjusted): 1974 2011				
Included observations: 38 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.03E+09*	6.58E+08	-3.093959	0.0042
D(FDI(-1))	3.601427*	1.566231	2.299423	0.0286
D(GDP(-1),2)	0.028855*	0.009172	3.145996	0.0037
D(GDP(-2),2)	0.023517**	0.013430	1.751113	0.0901
D(EXC)	-11534266	10208924	-1.129822	0.2675
D(INF)	5150970.	7824288.	0.658331	0.5153
POP	14.03380*	4.646842	3.020072	0.0051
ECM3(-1)	-3.992563*	1.585978	-2.517414	0.0174
R-squared	0.556106			
Adjusted R-squared	0.452531			
S.E. of regression	7.48E+08			
Sum squared resid	1.68E+19			
Log likelihood	-825.8666			
F-statistic	5.369103			
Prob(F-statistic)	0.000462			
Durbin-Watson stat	2.452628			

*(**) significant at 5 (10) percent level*

The result of the Autoregressive Distributed Lag model in table 4 achieved about 56 percent goodness of fit (about 45 percent after adjustment). This is shown graphically in Graph 1.

Graph 1



F-Prob (F-statistics) indicates that the exogenous variables are simultaneously significant in relation to their joint impact on foreign direct investment (FDI). Using 5% level of significant, estimated Durbin-Watson statistic (2.452628) is greater than upper-limit Durbin-Watson statistic (1.939). This implies that the regression result is void of autocorrelation bias.

Furthermore, at 5% level of significant, FDI (lag 1), GDP (lags 1 and 2), and population size show significant and positive impacts on FDI to Nigeria. As a result, the null hypotheses that economy size has no significant impact on FDI and that population size has no significant impact on FDI were rejected with a conclusion that market size, in terms of economy size and population, has significant and positive impacts on FDI to Nigeria. In otherwise, FDI to Nigeria is market-seeking motivated.

For instance, the result shows that a unit increase in GDP at lags 1 and 2 will increase FDI by about 0.029 units and 0.024 units respectively. Population shows greater impact on FDI. The result indicates that a unit increase in population will increase FDI by about 14.03 units.

In addition, the result shows that previous FDI to Nigeria has significant positive impact on FDI inflow. For instance, the result indicates that a unit increase in Lag 1 of FDI will lead to approximately 3.6 units increase in FDI inflow to Nigeria. This is similar to the conclusion of Enu, Havi and Attah-Obeng (2013) who concluded that first past year of foreign direct investment (FDI) to Ghana significantly influence FDI to Ghana. On the other hand, exchange rate and inflation rate are not significant determinants of FDI to Nigeria.

Causality Test

Let $\alpha = 5\% = 0.05$

Decision Rule: Reject H_0 if $Prob < \alpha (0.05)$; accept if otherwise.

The result of this test is summarized in table 5:

Table 5 –
Pairwise Granger Causality Tests

Sample: 1970 2011		Lags: 2			
Null Hypothesis:		Obs	F-Statistic	Prob. A	Remark
D(GDP,2) does not Granger Cause D(FDI)		38	6.25909	0.005	C
D(FDI) does not Granger Cause D(GDP,2)			2.05287	0.144	NC
POPNI does not Granger Cause D(FDI)		39	4.16246	0.024	C
D(FDI) does not Granger Cause POPNI			0.13890	0.870	NC

Note: C = Causality at 5%; NC = No Causality at 5%

Based on the result (table 5), the null hypothesis that market size does not granger cause FDI was rejected with the conclusion that economy size and population size granger cause FDI to Nigeria. In other words, variation in Nigerian market size in Nigeria precedes variation in FDI inflow to the country. This result suggests that market size may be a robust policy instrument for attracting FDI to Nigeria.

4. Conclusion

This paper examines whether the Nigerian market size influences FDI to the country. Autoregressive Distributed Lag (ARDL) model and Granger Causality test were estimated. The estimations were carried out using data covering the period 1970 to 2011. Market size was considered in terms of economy size measured using GDP and population size. The result agrees with other researchers who opine that economy size and population size are significant determinants of FDI to the domestic economy (Jaumotte, 2004; Chakrabarti, 2001; Billington, 1999; and Walsh and Yu, 2010). Countries with larger market size are expected to attract more FDI inflow than countries with smaller market size (Lankes and Venables, 1996; Duran, 1999; Resmini, 2000; Bevan and Estrin, 2000; Garibaldi, 2002; Nunes et al., 2006; Sahoo, 2006 as cited in Vijayakumar, Sridharan, and Rao, 2010). This paper, therefore, concludes that multinational enterprises consider Nigerian market size in the allocation of their foreign direct investment (FDI) to the country.

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