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EFFECT OF INSTITUTIONAL FACTORS ON FOREIGN DIRECT INVESTMENT IN NIGERIA

Ewubare Dennis Brown[1+]
Ekwe Ernest Ibekwe[2]

[1,2]*Department of Agricultural and Applied Economics, Rivers State University, Port Harcourt, Nigeria*
[1]*Email: dennisewubare@yahoo.com Tel: 08037068750*
[2]*Tel: 08033414665*

(+ Corresponding author)

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ABSTRACT

The study investigates the effect of economic, political and social institutions on FDI in Nigeria between 1980 and 2015. The Stock-Watson Dynamic Least Squares (DOLS) is relied upon for analyzing the data extracted from the World Bank WDI. The KPSS stationarity results indicate that all the variables were mixed integrated with FDI and political integration being levels stationary while economic and social factors were first difference stationary. The Johansen cointegration test finds evidence of two cointegrating equations in the model, indicating that long run relationship exists among the variables. The estimated cointegrating regression model showed that economic and social integrations were highly significant in explaining changes in FDI. Political institution factors, on the other hand, have an insignificant positive relationship with FDI. The Wald test showed evidence to support that the coefficients of the regressors were significantly different from zero. The result of the Granger causality test reveals that political and social institution has high predictive power for FDI flows to the Nigerian economy. Based on the findings, this study recommends that Nigeria should adopt a gradual reduction in all economic, political and social constraint to FDI inflows to optimize the benefits of foreign direct investment in Nigeria.

Contribution/Originality: This paper is one of very few studies which have investigated the role of institutional quality in mobilizing FDI in capital deficient economies. Its measure of institutional quality from social, economic and political dimensions is noteworthy which add significantly to the existing literature.

1. INTRODUCTION

The determinants of FDI in poor countries have been characterized by controversies as suggested by empirical evidences in existing literature. The sources of these controversies could be traced to the problem associated with collecting appropriate data or using the proper proxies for the variables considered as qualitative in nature. For instance, Asiedu (2002); Anyanwu (2012) and Adeoye (2009) used telephones in measuring infrastructure development, which fails to reliably and efficiently capture the level of infrastructure in the recipient economy. Although telephone lines may be available to the majority of the population, poor transportation network, inadequate power supply and underdeveloped financial system are the major bottlenecks impeding growth and and as such contracts FDI inflow. These factors tend to limit the capacity of institutional factors ability to attract FDI inflows as outlined in Farooque and Yarram (2010).

The principles underlying the importance of institutional quality in mobilizing FDI are attributed to what make up the institution. For instance, good institutional qualities in the form of political stability, security; controlled corruption and enforcement of rule of law in the host country give good signals to foreign investors. Wei (2000) argued that absence of institutional quality due to incidence of corruption, bureaucracy and high levels of extortions tend to limit the ease of doing business both for domestic and foreign investors. Hence, cost of business operation increases due to poor institutional quality. However, non-enforcement of property rights has been identified in literature as one of the sources of risks of expropriation and hence tends to deter investors from taking part in business activities in the recipient FDI countries. It is therefore necessary to take into consideration the issues underpinning the political economy of FDI. The past studies on the impact of institutional quality on FDI flows have been relatively limited in Nigeria, regardless of the huge amount of literature that exist on the predictors FDI.

2. STATEMENT OF THE PROBLEM

High-quality institutional environment has been identified as panacea to FDI inflows. Hence, it is important for the institutional factors to be identified as they help to promote the process globalization in the recipient country. However, it is notable that institutions are borne out of human beings. Therefore, building stronger institutions rather than human beings is the prerequisite for rapid growth and development, especially in mobilizing foreign capital in Nigeria. The institutional quality suggests that Nigeria consciously or otherwise build strong personalities, thus creating a barrier to free flow of foreign investments.

Furthermore, FDI has received a wide range attention as a factor determining the pace of growth in the recipient countries, especially in the poor countries like Nigeria (Khan and Ahmad, 2008). It is theoretically established that institutional quality plays important role in driving the process of growth through inflows of FDI. The nature of these institutions in Nigeria is perceived by economists and non-economists alike as not impressive compared to what is obtainable in some emerging countries. This has continued to remain a source worry to policy makers and potential foreign investors. In view of the relevance of institutional quality in driving the investment decision of foreigners, continuous fear and uncertainty have characterized the poor dimensions of institutional quality considering the extent of FDI in Nigeria. It is based on the above that this study is designed to achieve the specific objectives such as to determine the effect of economic, political and social factors on FDI on FDI Nigeria.

2.1. Theoretical and Empirical Literature

The eclectic theory also known as concept of OLI paradigm was used for this study. This theory seeks to provide better insight on the decision of a firm on locating its investment in foreign countries rather than producing locally and exporting to other countries. Past studies tried to explore relationship between institutional quality and FDI with the findings showing both direct and indirect effects. Globerman and Shapiro (1999) opined that better institutions are good for inward FDI given that they provide enabling environments for multinational companies to profitably invest outside their home countries.

In their study, Stein and Daude (2001) found that their measures of institutional variables are significant in driving inward FDI. Wei (2000) posited that poorly regulated institutions add to the constraints to bilateral FDI flows. However, Campos *et al.* (1999) are of the opinion that corruption stands as notable bottlenecks to FDI. This agrees with the conclusion of Brunetti *et al.* (1998). Additionally, Kostevc *et al.* (2007) contributed by arguing that FDI tends to move to different destinations when property rights are not clearly defined and enforced. Contrarily, some studies tend not to find any empirical evidence to support the claim that institutions and FDI are related positively. For instance, Wheeler and Mody (1992) did not find any strong link between institutions and FDI. Notably, human capital, healthcare, labor force and the quality of public facilities were identified by Globerman and Shapiro (2002) and Mody and Srinivasan (1998) as having indirect effects on FDI.

3. METHDOLOGY

Data required for the study was the time series data which consist of foreign direct investments as dependent variable and the independent variable which includes economic, political and social institutions. Country-specific time series data spanning from 1980-2015 sourced from World Bank World Development Indicators were utilized in this study.

3.1. Estimation Technique/ Method of Data Analysis

The Dynamic Least Squares (DOLS) methodology credited to Stock and Watson (1993) was employed in this study to estimate the cointegrating regression model. The choice of this estimation approach stems from its efficiency to produce robust estimates for both small datasets and relatively large sample. Additionally, the DOLS has the potential of producing optimal estimates of cointegration regressions and corrects for endogeneity usually associated with explanatory variables by adding lags and leads of the first differences of the explanatory variables.

3.1.1. Pre-Estimation Tests

i. Stationarity test: This study specifically employs Kwiatkowski *et al.* (1992) to conduct the stationarity test to determine whether or not each of the series is stationary. The KPSS has advantage over the Augmented Dickey Fuller approach as the latter tends to be associated with low power and inefficient in the evident of structural break in the series. The null hypothesis of stationarity is tested against the alternative hypothesis of no stationarity at 5 percent level. This general form of the unit root test model with a constant and trend is formalized below:

$$\Delta Z_t = \eta_0 + \eta_1 Z_{t-1} + \sum_{i=1}^{f} c_i \, \Delta Z_{t-i} + \mu_t \qquad (3.1)$$

Where: Z_t = Economic time series under consideration, η_1 and c_i = parameter estimates, f = lag length, Δ= First difference operator and μ_t = Random disturbance term

ii. Cointegration test: The Johansen Maximum Likelihood (JML) test was adopted in this study to examine whether or not the variables are cointegrated. Specifically, the Trace and Max-Eigen statistics provides basis for rejecting the null hypothesis and vice versa.

3.1.2. Post- Estimation Tests

Aside the pre-estimation tests, some post estimation tests were carried out in the course of the study. Notably, Wald test and normality tests were conducted. The Wald is relied upon to examine if the estimates of the regressors are significant different from zero. The normality test on the other hand was utilized to check if the error terms are normally distributed. The probability value of the Jarque-Bera statistics forms basis for this test. Additionally, the Granger causality test is employed to determine the direction of causality among the variables. The null hypothesis of null causality is tested against the alternative hypothesis of causality at 5 percent level. Causality is established when the null hypothesis is rejected and vice versa. The rejection of the null hypothesis depends on the computed probability value (P-value) of the chi-square distributed statistic. If the p-value is less than or equal to 0.05 the null hypothesis is rejected, but if otherwise the null hypothesis cannot be rejected.

3.2. Model Specification

The functional relationships between the dependent variable and regressors are formalized as:

$$FDI = f(ECGO, PLGO, SCGO) \qquad (3.2)$$

Where: FDI = Foreign direct investment, ECGO = Economic factor, PLGO = political factor, SCGO = social factor.

Equation (3.2) is expressed as a cointegrating model below:

$$InFDI_t = \quad h_0 + \lambda_1 InECGO_t + \lambda_2 InPLGO_t + \lambda_3 InSCGO_t + \sum_{j=-y}^{b} \emptyset_1 \Delta InECGO_{t-y} + \sum_{j=-y}^{b} \emptyset_2 \Delta InPLGO_{t-y} + \sum_{j=-y}^{b} \emptyset_3 \Delta InSCGO_{t-y} + \mu_t \quad (3.3)$$

Where: FDI, ECGO, PLGO and SCGO are as earlier defined in equation (3.2), h_0 is the constant term, $\lambda_1 - \lambda_3$ are long run multipliers which captures long run effects of variations in the regresors on the dependent variable, b and y are the maximum lag and lead lengths respectively, and μ_t is random error term.

The a priori expectations of the require that: $\lambda_1 > 0, \lambda_2 > 0, \lambda_3 > 0$.

4. TREND ANALYSIS

The trends of foreign direct investment, economic, political and social factors in Nigeria based on data adapted from notable sources, especially World Bank world development indicators and KOF institutional index are depicted in figures 1 to 4

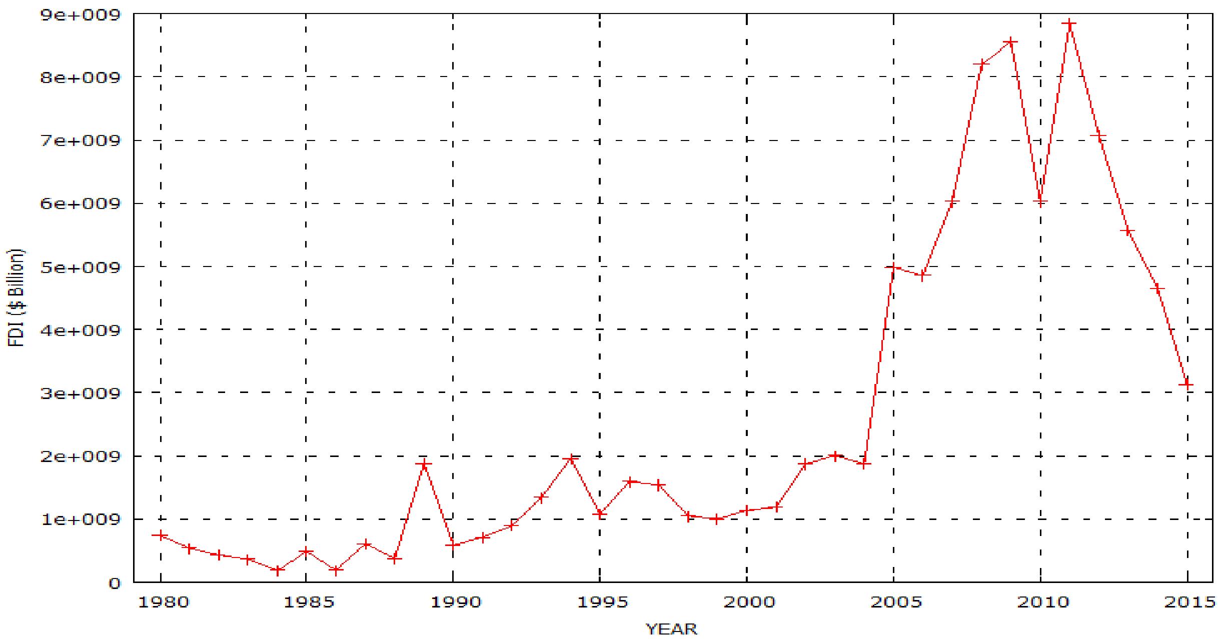

Figure 1: Trends of FDI in Nigeria, 1980-2015

Source: Author's estimation based on underlying data adapted from World Bank (2016) World Development Indicators (WDI)

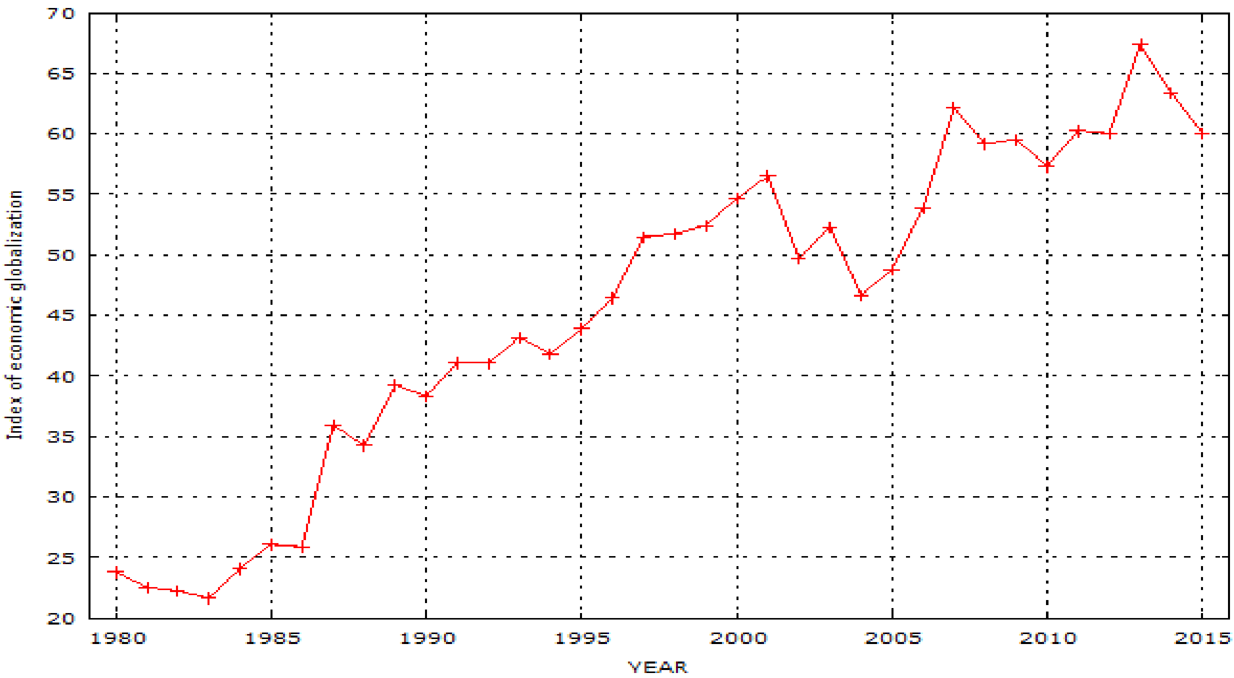

Figure 2: Trends of FDI in Nigeria, 1980-2015

Source: Author's estimation based on underlying data adapted from KOF (2013, 2014 and 2015) Index of Globalization*

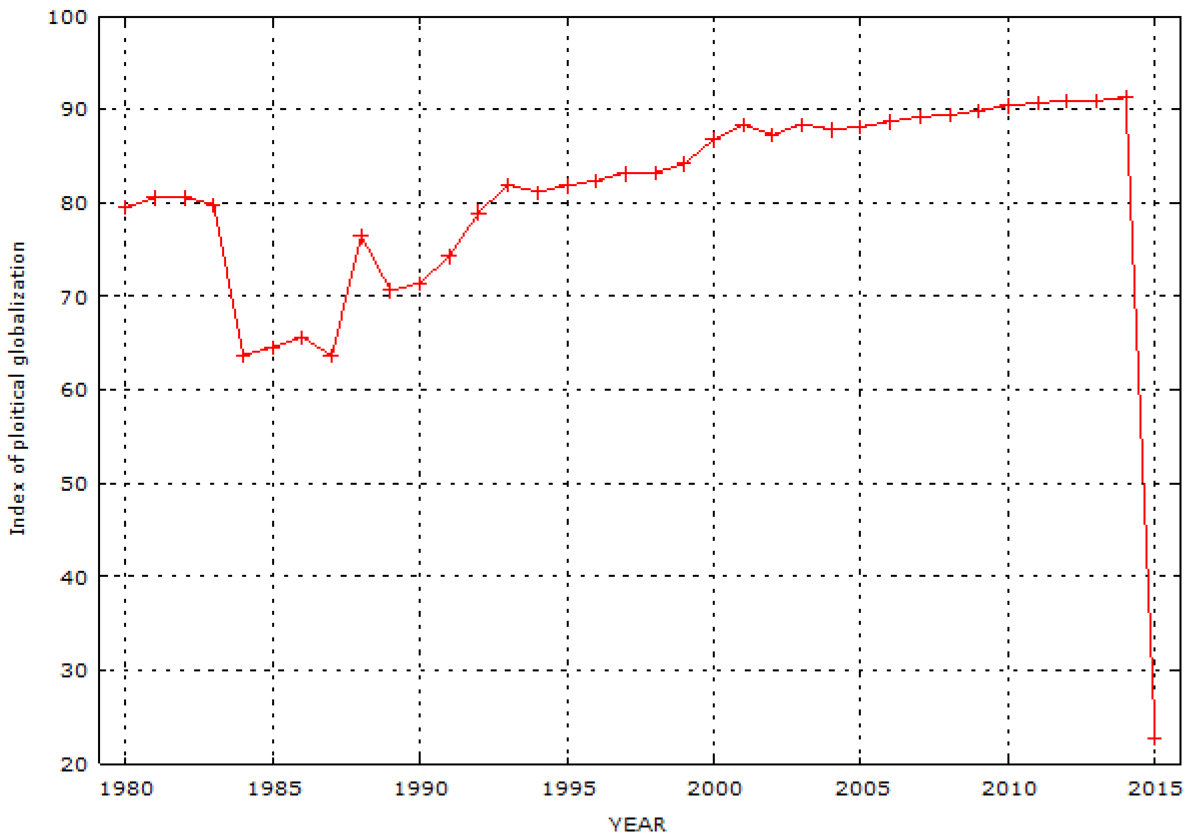

Figure-3. Trends of FDI in Nigeria, 1980-2015

Source: Author's estimation based on underlying data adapted from KOF (2013, 2014 and2015) Index of Globalization*.

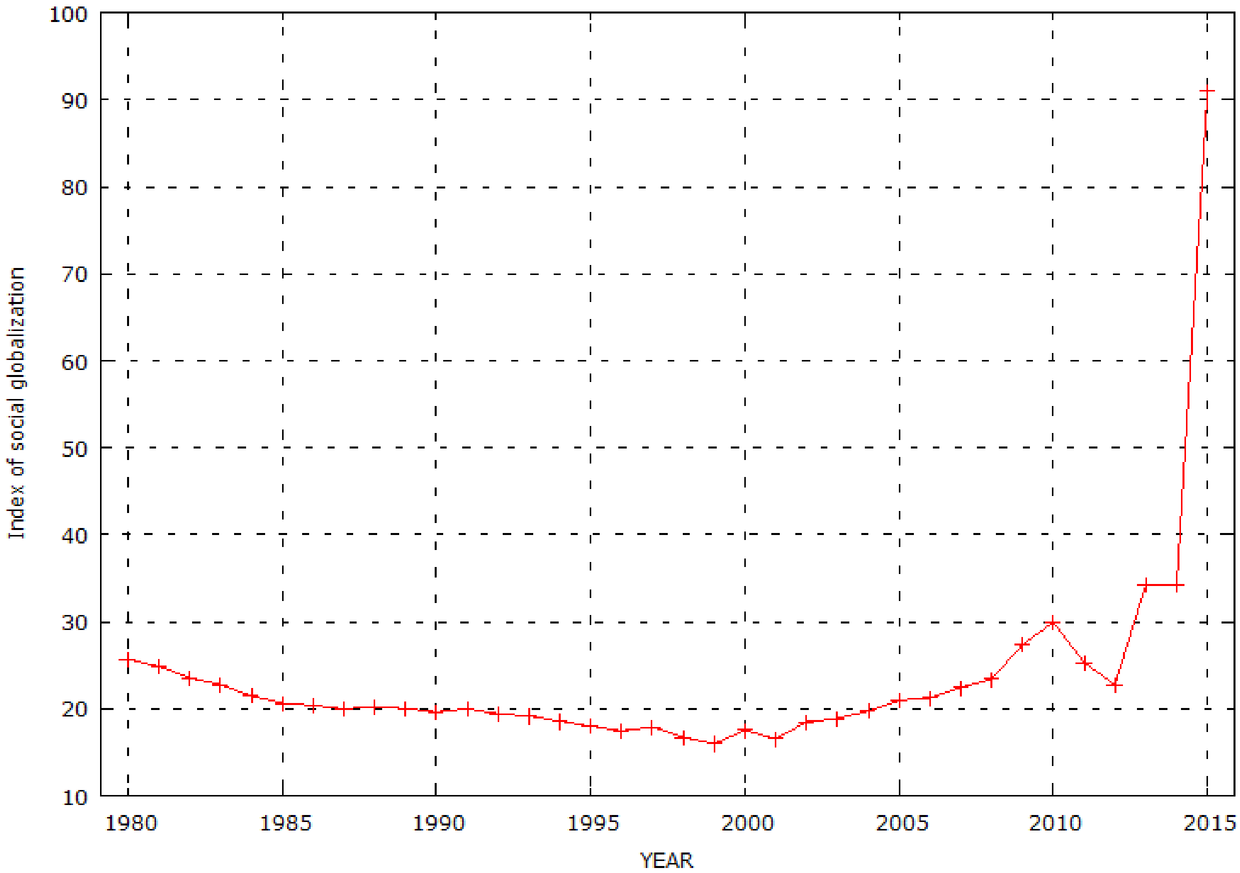

Figure-4. Trends of FDI in Nigeria, 1980-2015

Source: Author's estimation based on underlying data adapted from KOF (2013, 2014 and 2015) Index of Globalization*.

4.1. Unit Root Test

Before estimating the model, the time series characteristics of each of the underlying series is examined via unit root test. Specifically, the approach to unit root test proposed by Kwiatkowski *et al.* (1992) was adopted to examine the time series properties of the underlying series. The result is report in Table 1 hereunder.

Table-1. Results of the KPSS unit root test on the underlying series

KPSS UNIT ROOT TEST							
Variables	**Levels**			**First Difference**			
	KPSS test stat	Test critical value (5%)	Inference	KPSS test stat	Test critical value (5%)	Inference	Order of integration
Log (FDI)	0.0649	0.146	S	0.1872	0.146	NS	I(0)
Log (ECGO)	0.1817	0.146	NS	0.1023	0.146	S	I(1)
Log (PLGO)	0.1429	0.146	S	0.1397	0.146	S	I(0)
Log (SCGO)	0.2913	0.146	NS	0.1187	0.146	S	I(1)

Source: Authors computation using E-views 9

NB: NS and S respectively imply non-stationary and stationary at levels. I(0) and I(1) denote integrated of order zero and one respectively.

4.2. Johansen Conitegration Test

The Johansen coitegration approach was relied upon for examining if the series are cointegrated or not. The null hypothesis of no cointegration was tested against the alternative hypothesis of cointegration at 5 percent level. Evidence of at least one cointegrating equation provides basis for rejecting the null hypothesis. The result of the cointegration test is presented in Table 2.

Table-2. Johansen Cointegration Test Result

Series: LOG(FDI) LOG(ECGO) LOG(PLGO) LOG(SCGO)				
Trace test				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	Prob.**
None *	0.615431	70.42499	47.85613	0.0001
At most 1 *	0.552041	39.84477	29.79707	0.0025
At most 2	0.325981	14.14704	15.49471	0.0790
At most 3	0.046483	1.523132	3.841466	0.2171
Max-Eigen test				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.615431	30.58022	27.58434	0.0200
At most 1 *	0.552041	25.69773	21.13162	0.0106
At most 2	0.325981	12.62391	14.26460	0.0894
At most 3	0.046483	1.523132	3.841466	0.2171

Source: Author's Computation Using E-views 9

4.2.1. Estimation of Cointegrating Regression Model

The Stock-Watson DOLS is employed for the estimation of the cointegrating regression model. This methodology is preferred to other econometric approaches as it is considered robust for coping with small observations and corrects for endogeneity in the explanatory variables. The estimated cointegrating regression model is reported in Table 3 as follows.

Table-3. Cointegrating Regression Result

Dependent variable: LOG(FDI)				
Regressor	**Coefficient**		**t-Statistic**	**Prob.**
LOG(ECGO)	1.888132		3.077501	0.0059
LOG(PLGO)	3.520057		2.034199	0.0554
LOG(SCGO)	2.510531		4.171507	0.0005
C	-9.112314		-1.583730	0.1289
R-squared	0.899445	Long-run variance		0.188527
Durbin-Watson stat	2.154016			

Source: Author's Computation Using E-views 9

4.3. Wald test for Coefficients Restrictions

The Wald test is employed to determine whether or not the estimates of the regressors are equal to zero.. The result is presented in Table 4.

Table-4.4. Result of the Wald test

Test Statistic	Value	Df	Probability
F-statistic	28.762	(3, 20)	0.0000
Chi-square	86.287	3	0.0000

Source: Author's Computation Using E-views 9

4.4. Normality Test

The test for normality was conducted at 5 percent level based on Jargue-Bera statistics and the result is presented below.

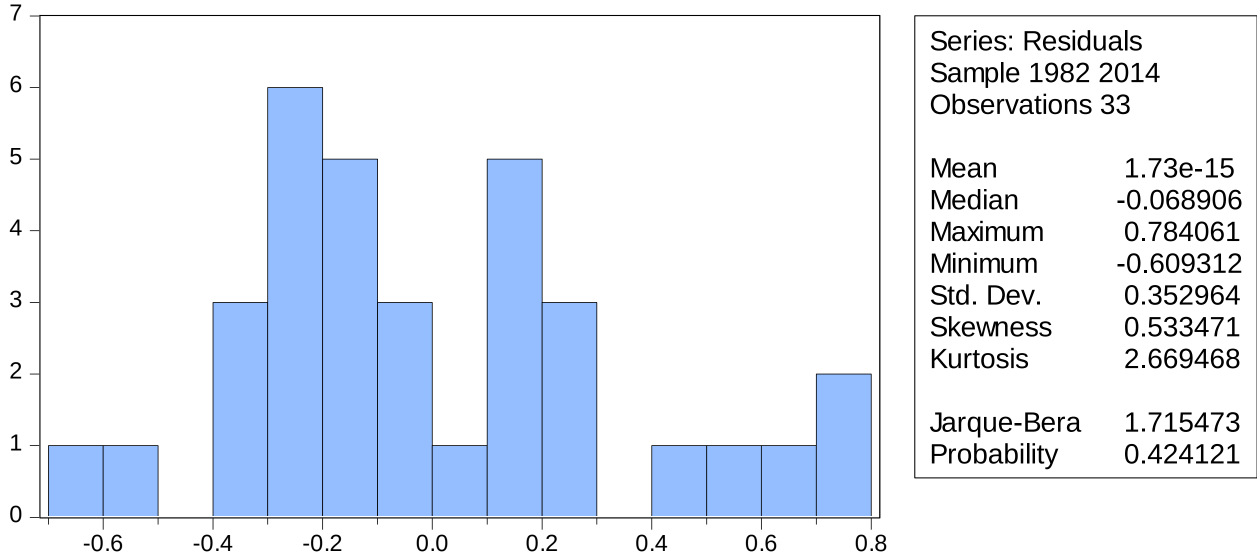

Figure-4.5. Jarque-Bera Statistic

Source: Author's Computation Using E-views 9

From the result, it was found that the probability value (0.424) of the Jarque-Bera Statistic (1.715) is more than the 0.05 level of significance. This is suggestive that the residuals are normally distributed at 5 percent.

4.5. Causality Test

This test is employed to determine the direction of causality among the variables. The result of the test is summarized in Table 5.

Table-5. Result of Granger Causality Test

Causality	DF	X^2–stat.	P-value	Remark
LOG(ECGO) → LOG(FDI)	5	16.575	0.0054	Rejected
LOG(FDI) → LOG(ECGO)	5	5.315	0.3786	Fails to reject
LOG(PLGO) → LOG(FDI)	5	52.17	0.0000	Rejected
LOG(FDI) → LOG(PLGO)	5	1.896	0.8632	Fails to reject
LOG(SCGO) → LOG(FDI)	5	16.246	0.0062	Rejected
LOG(FDI) → LOG(SCGO)	5	2.740	0.7400	Fails to reject
LOG(ECGO), LOG(PLGO), and LOG(SCGO) →LOG(FDI)	15	71.133	0.0000	Rejected

Source: Author's Computation Using E-views 9

5. RESULTS OF THE KPSS UNIT ROOT TEST

Table 1 shows the results of the stationarity test. It was found that FDI and political factor are stationary at levels. This is because their computed KPSS statistics (0.0649 and 0.1429) are less their corresponding critical values at 5 percent. Economic and social factor on the other hand are found to be stationary at first difference given their calculated KPSS statistics (0.1023 and 0.1187) reported at the right-most part of Table 1 falls below the 5 percent critical value (0.146). Based on the observations, FDI and political factor are integrated of order zero I(0) while economic and social integration are first difference stationary. Following evidences of various orders of integration for the series, the Johansen cointegration test is employed to examine whether or not the variables have long run relationship.

5.1. Johansen Cointegration Test Result

Table 2 presents the Johansen cointegration test. Both Trace and Max-Eigen statistics show evidence of two cointegration equations at 5 percent level, thus necessitating the rejection of the null hypothesis that the variables are cointegrated at 5 percent. This suggests that the variables are cointegrated. In view of this finding, the cointegrating regression model is estimated using DOLS.

5.2. Cointegrating Regression Result

The result of the cointegrating regression result in Table 3 indicates that the coefficients of economic and social factors have the expected positive signs and significant at 5 percent level. This is consistent with the a priori and statistical expectations. The result further shows that a percentage increase in economic factor has the potential of increasing FDI inflows by 1.89 percent. Similarly, 1 percent increase in political and social factor boosts inward FDI by 3.53 percent and 2.51 percent respectively. The significant positive effects of the economic and social factor on inflow of FDI necessitate the rejection of the hypotheses that the two indicators of globalization and FDI inflows in Nigeria are not significantly related. These findings suggest those economic and social factor are important predictors of FDI inflows to the Nigerian economy. The coefficient of determination (0.899) further shows that economic, political and social factor jointly accounted for 89.9 percent of the total variations in FDI inflows to Nigeria. This is very satisfactory as it exceeds the benchmark of 50 percent, indicating that the regressors have high explanatory power for FDI during the sampled period. Additionally, the long run variance (0.188) is very low and the Durbin-Watson statistic (2.15) indicates that the model is devoid of positive first order serial correlation. This is very welcoming as it validates the reliability of the estimated model for purposes of prediction and policy formulation.

5.3. Wald Test Results

Table 4 shows the Wald test result. The probability value (0.000) of the F-statistic 28.76) is less than the 0.05 significance level. This indicates that the coefficients of the regressors meet the statistical criteria. This prompts the rejection of the null hypothesis at 5 percent level.

5.4. Normality Test

From the result, it was found that the probability value (0.424) of the Jarque-Bera Statistic (1.715) is more than the 0.05 level of significance. This is suggestive that the residuals are normally distributed at 5 percent.

5.5. Causality Test

The causality test reported in Table 5 shows that a unidirectional causality runs from economic, political and social factor to FDI. This is an indication that each of the indicators of global integration has predictive power for FDI inflows to Nigeria. The result further shows that taken together, the three indicators of globalization causes FDI inflows to Nigeria. This finding authenticates the outcome of the cointegrating regression result. This necessitates the rejection of the null hypothesis that collectively economic, social and political integration do not cause FDI inflows.

6. CONCLUSION AND RECOMMENDATION

The findings of the study demonstrate that economic, political and social integrations are important drivers of FDI to the Nigerian economy. Specifically, economic and social integrations were highly significant in explaining changes in foreign direct investment in Nigeria over the study period (1980-2015). Thus, contrary to controversies surrounding the potentials of institutional factors in driving capital flows to low income countries including Nigeria, this study finds evidence to support the argument that institutional factors indeed enhances capital flows. Drawing support from the Granger causality test, it is concluded that on the average economic, political and social factors are important determinants of FDI flows to Nigerian economy. Owing to the results obtained from the study, the following recommendations were made; that Nigeria should gradually reduce all economic, political and social constraints to FDI inflows in order to optimize the benefits of institutional factors and again, more exchange rate flexibility should be allowed to accompany economic globalization in order to reduce the economic uncertainties perceived by foreign investors.

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Contributors/Acknowledgement: Both authors contributed equally to the conception and design of the study.

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APPENDIX

RESULT OF KPSS UNIT ROOT TEST ON LOG (FDI) AT LEVELS

Null Hypothesis: LOG(FDI) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.064947
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.245894
HAC corrected variance (Bartlett kernel)				0.439738

KPSS Test Equation
Dependent Variable: LOG(FDI)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.53432	0.166601	117.2520	0.0000
@TREND("1980")	0.092078	0.008186	11.24773	0.0000
R-squared	0.788177	Mean dependent var		21.14568
Adjusted R-squared	0.781947	S.D. dependent var		1.092710
S.E. of regression	0.510253	Akaike info criterion		1.546134
Sum squared resid	8.852191	Schwarz criterion		1.634108
Log likelihood	-25.83042	Hannan-Quinn criter.		1.576839
F-statistic	126.5114	Durbin-Watson stat		1.221195
Prob(F-statistic)	0.000000			

RESULT OF KPSS UNIT ROOT TEST ON LOG (FDI) AT 1ST DIFFERENCE

Null Hypothesis: D(LOG(FDI)) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 12 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.187241
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.306279
HAC corrected variance (Bartlett kernel)				0.082399
KPSS Test Equation				
Dependent Variable: D(LOG(FDI))				
Method: Least Squares				
Date: 03/29/17 Time: 05:06				
Sample (adjusted): 1981 2015				
Included observations: 35 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.041859	0.196882	0.212608	0.8329
@TREND("1980")	-3.47E-05	0.009539	-0.003634	0.9971
R-squared	0.000000	Mean dependent var		0.041235
Adjusted R-squared	-0.030303	S.D. dependent var		0.561505
S.E. of regression	0.569949	Akaike info criterion		1.768905
Sum squared resid	10.71977	Schwarz criterion		1.857782
Log likelihood	-28.95583	Hannan-Quinn criter.		1.799585
F-statistic	1.32E-05	Durbin-Watson stat		3.093127
Prob(F-statistic)	0.997122			

RESULT OF KPSS UNIT ROOT TEST ON LOG(ECGO) AT LEVELS

Null Hypothesis: LOG(ECGO) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.181780
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.016472
HAC corrected variance (Bartlett kernel)				0.056404

KPSS Test Equation
Dependent Variable: LOG(ECGO)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.240123	0.043120	75.14129	0.0000
@TREND("1980")	0.030102	0.002119	14.20695	0.0000
R-squared	0.855833	Mean dependent var		3.766909
Adjusted R-squared	0.851593	S.D. dependent var		0.342818
S.E. of regression	0.132066	Akaike info criterion		-1.157078
Sum squared resid	0.593008	Schwarz criterion		-1.069105
Log likelihood	22.82741	Hannan-Quinn criter.		-1.126373
F-statistic	201.8375	Durbin-Watson stat		0.410333
Prob(F-statistic)	0.000000			

RESULT OF KPSS UNIT ROOT TEST ON LOG (ECGO) AT 1ST DIFFERENCE

Null Hypothesis: D(LOG(ECGO)) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.102368
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.006753
HAC corrected variance (Bartlett kernel)				0.002672

KPSS Test Equation
Dependent Variable: D(LOG(ECGO))
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.050731	0.029234	1.735327	0.0920
@TREND("1980")	-0.001350	0.001416	-0.953229	0.3474
R-squared	0.026797	Mean dependent var		0.026428
Adjusted R-squared	-0.002694	S.D. dependent var		0.084516
S.E. of regression	0.084629	Akaike info criterion		-2.045626
Sum squared resid	0.236350	Schwarz criterion		-1.956749
Log likelihood	37.79845	Hannan-Quinn criter.		-2.014945
F-statistic	0.908645	Durbin-Watson stat		2.506581
Prob(F-statistic)	0.347405			

RESULT OF KPSS UNIT ROOT TEST ON LOG (PLGO) AT LEVELS

Null Hypothesis: LOG(PLGO) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.142914
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.054660
HAC corrected variance (Bartlett kernel)				0.061695

KPSS Test Equation
Dependent Variable: LOG(PLGO)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.330684	0.078548	55.13396	0.0000
@TREND("1980")	0.001937	0.003860	0.501731	0.6191
R-squared	0.007350	Mean dependent var		4.364573
Adjusted R-squared	-0.021846	S.D. dependent var		0.237987
S.E. of regression	0.240572	Akaike info criterion		0.042359
Sum squared resid	1.967748	Schwarz criterion		0.130332
Log likelihood	1.237537	Hannan-Quinn criter.		0.073064
F-statistic	0.251734	Durbin-Watson stat		1.033265
Prob(F-statistic)	0.619090			

RESULT OF KPSS UNIT ROOT TEST ON LOG(PLGO) AT 1ST DIFFERENCE

Null Hypothesis: D(LOG(PLGO)) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.139744
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.052765
HAC corrected variance (Bartlett kernel)				0.052765

KPSS Test Equation
Dependent Variable: D(LOG(PLGO))
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.075676	0.081719	0.926051	0.3611
@TREND("1980")	-0.006189	0.003959	-1.563270	0.1275
R-squared	0.068949	Mean dependent var		-0.035734
Adjusted R-squared	0.040735	S.D. dependent var		0.241535
S.E. of regression	0.236565	Akaike info criterion		0.010256
Sum squared resid	1.846776	Schwarz criterion		0.099133
Log likelihood	1.820518	Hannan-Quinn criter.		0.040936
F-statistic	2.443812	Durbin-Watson stat		1.167295
Prob(F-statistic)	0.127529			

RESULT OF KPSS UNIT ROOT TEST ON LOG (SCGO) AT LEVELS

Null Hypothesis: LOG(SCGO) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.219301
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski *et al.* (1992)				
Residual variance (no correction)				0.075132
HAC corrected variance (Bartlett kernel)				0.190291

KPSS Test Equation
Dependent Variable: LOG(SCGO)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.887580	0.092091	31.35588	0.0000
@TREND("1980")	0.011861	0.004525	2.621130	0.0130
R-squared	0.168101	Mean dependent var		3.095145
Adjusted R-squared	0.143633	S.D. dependent var		0.304785
S.E. of regression	0.282048	Akaike info criterion		0.360473
Sum squared resid	2.704735	Schwarz criterion		0.448446
Log likelihood	-4.488517	Hannan-Quinn criter.		0.391178
F-statistic	6.870325	Durbin-Watson stat		0.452670
Prob(F-statistic)	0.013011			

RESULT OF KPSS UNIT ROOT TEST ON LOG (SCGO) AT 1ST DIFFERENCE

Null Hypothesis: D(LOG(SCGO)) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

				LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic				0.118785
Asymptotic critical values*:		1% level		0.216000
		5% level		0.146000
		10% level		0.119000
*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)				
Residual variance (no correction)				0.028036
HAC corrected variance (Bartlett kernel)				0.028036

KPSS Test Equation
Dependent Variable: D(LOG(SCGO))
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.105969	0.059567	-1.778997	0.0845
@TREND("1980")	0.007894	0.002886	2.735421	0.0099
R-squared	0.184834	Mean dependent var		0.036131
Adjusted R-squared	0.160131	S.D. dependent var		0.188160
S.E. of regression	0.172438	Akaike info criterion		-0.622118
Sum squared resid	0.981246	Schwarz criterion		-0.533241
Log likelihood	12.88706	Hannan-Quinn criter.		-0.591437
F-statistic	7.482528	Durbin-Watson stat		1.591728
Prob(F-statistic)	0.009947			

JOHANSEN COINTEGRATION RESULT

Date: 03/29/17 Time: 05:30
Sample (adjusted): 1984 2015

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.615431	70.42499	47.85613	0.0001
At most 1 *	0.552041	39.84477	29.79707	0.0025
At most 2	0.325981	14.14704	15.49471	0.0790
At most 3	0.046483	1.523132	3.841466	0.2171

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.615431	30.58022	27.58434	0.0200
At most 1 *	0.552041	25.69773	21.13162	0.0106
At most 2	0.325981	12.62391	14.26460	0.0894
At most 3	0.046483	1.523132	3.841466	0.2171

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

COINTEGRATION REGRESSION RESULT

Dependent Variable: LOG(FDI)
Method: Dynamic Least Squares (DOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(ECGO)	1.888132	0.613528	3.077501	0.0059
LOG(PLGO)	3.520057	1.730439	2.034199	0.0554
LOG(SCGO)	2.510531	0.601828	4.171507	0.0005
C	-9.112314	5.753705	-1.583730	0.1289
R-squared	0.899445	Mean dependent var		21.17723
Adjusted R-squared	0.839111	S.D. dependent var		1.113082
S.E. of regression	0.446467	Sum squared resid		3.986664
Durbin-Watson stat	2.154016	Long-run variance		0.188527

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	28.76257	(3, 20)	0.0000
Chi-square	86.28770	3	0.0000

Null Hypothesis: C(1)=C(2)=C(3)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	1.888132	0.613528
C(2)	3.520057	1.730439
C(3)	2.510531	0.601828

Restrictions are linear in coefficients.

GRANGER CAUSALITY TEST RESULT

VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: LOG(FDI)			
Excluded	Chi-sq	df	Prob.
LOG(ECG)	16.57562	5	0.0054
LOG(PLGO)	52.17830	5	0.0000
LOG(SCG)	16.24641	5	0.0062
All	71.13324	15	0.0000
Dependent variable: LOG(ECGO)			
Excluded	Chi-sq	df	Prob.
LOG(FDI)	5.315730	5	0.3786
LOG(PLGO)	11.12720	5	0.0489
LOG(SCG)	5.159436	5	0.3967
All	32.82798	15	0.0050

Dependent variable: LOG(PLGO)

Excluded	**Chi-sq**	**df**	**Prob.**
LOG(FDI)	1.896989	5	0.8632
LOG(ECG)	7.570489	5	0.1815
LOG(SCG)	54.03328	5	0.0000
All	78.99206	15	0.0000
Dependent variable: LOG(SCGO)			
Excluded	Chi-sq	Df	Prob.
LOG(FDI)	2.740144	5	0.7400
LOG(ECG)	7.140130	5	0.2104
LOG(PLGO)	9.058919	5	0.1067
All	13.82895	15	0.5385