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The Consociation between Investment, Exchange Rate, Interest Rate and Economic Development in Nigeria (ARDL Approach)

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Abstract: This study seek to amplify the chemistry between foreign direct investment, exchange rate, interest rate and economic development in Nigeria between the periods 1986 to 2015 using Auto Regressive Distributive Lag model. From the statistical report, we discovered that foreign direct investment and interest rate exhibit a direct relationship to economic development in Nigeria. Study further suggest that the low rate of interest promote investment paradox and thus stimulate economic development in Nigeria while the report from the exchange rate shows that if exchange rate is appreciating, economic development is been stimulated. This therefore suggest that an appreciating exchange rate is capable of attracting foreign investors and thus promote economic development as the case may be. The inter-relationship between exchange rate, foreign investment and economic development is expected to be direct accordingly such that rise in exchange rate attract foreign investment and thus promote economic development in Nigeria. The policy implication is that if Exchange Rate appreciates, then Naira will be cheap relative to other currencies, this can attract Foreign Direct Investment inflow into the Nigerian economy through the window of reduce Naira value and cheap investment in Nigeria. Based on this findings, study recommends that authorities in charge of managing the Nigerian economy should as a matter of urgency revamp the lending habit by introducing low interest rate as this will make it cheaper to borrow and this encourages spending and investment lending to higher aggregate demand which will further stimulate economic development.

Keywords: Foreign Direct Investment, Economic Development, Macro Economic Variables

INTRODUCTION

The inter-relationships between interest rate, exchange rate, foreign direct investment and economic development in emerging economies is dynamic depending on the absorbing capacity of the country and her responsiveness to technology. According to the UNCTDA report of [1], foreign direct investment can be defined as an investment involving a long term business interest and control by a foreign investor in another country different from that of the investor. The role played by foreign direct investment in actualising economic development in a nation cannot be under estimate. As such, across the border transaction is celebrated mostly in the developing countries as it is seen as an avenue to promote and encourage inflows of technology, skill, materials and bridge the gap between savings, exchange rate and government spending [2].

Arising from the foregoing, Foreign Direct Investment, interest rate and exchange rate are interrelated through the web of globalization in recent years for development purposes. Some researchers have reported that abortive move in Foreign Direct Investment are caused by changes in exchange rate and interest rate volatilities while others see it the other way round.

The effect of the instability of interest rate and exchange rate is very significant to foreign direct investment inflow to a developing nation like Nigeria experiencing transition and emerging markets. A rise in interest rate will cause an increase in current real exchange rate. Hence, the variation between exchange rate and interest rate consistently correlates to Foreign Direct Investment inflows and thus amplified economic development. Foreign Direct Investment inflows are essential for an emerging resource-based economy like Nigeria.

The required prerequisite to attract adequate Foreign Direct Investment are classified into political, economic, legal and social factors. Higher profitability on investments, political stability, suitable investment climate, cheap labour and production cost, adequate and functional infrastructure amenities and a stable regulatory environment also help to invite and retain Foreign Direct Investment in a nation [3]. Investments are generally capital intensive and most time requires

huge loanable funds which usually demand high interest rate. Interest rate is the cost of capital, measured in naira, per year based on the money (principal) borrowed. Precisely, "the interest rate is the percentage of principal paid for a number of times at a particular period throughout the term of the loan".

Generally high interest rate on loanable funds increases the cost of capital which invariably discourages investors from accumulating more capital, and consequently discourages Foreign Investment. This therefore suggest that a reasonable level of economic development could be attained with a minimal level of interest rate which further encourages currency exchange and thus attract foreign investors. Exchange rate is the measure of the worth of domestic currency in terms of foreign currency. Exchange rate can either be nominal or real. Exchange rate is imperative to attract Foreign Direct Investment, so an over-valued exchange rate will discourage exportation and affect Foreign Direct Investment negatively.

Exchange rate and interest rate volatility has grown overtime and such economic variations can result in significant depreciation in the value of assets invested by investors in the host country as well as the future profits created by the investment. Investments in a nation like Nigeria will have a more risky stream of profits due to high degree of volatility of interest rate and exchange rate.

Another factor connecting exchange rate and interest rate to foreign direct investment, and their associated relationship to economic development is via its impact of inflation. Since nominal interest rate depends on anticipated inflation, while nominal exchange rate is determined by the relative rate of domestic and foreign inflation, an inflation shock will affect both nominal interest rate and exchange rate and thus has a spill over effect on economic development.

Apparently, Foad [4] exert that Nations with high levels of currency risk will lose out on foreign direct investment compared to nations with more stable currencies. In the Nigerian context however, Osinubi and Amaghioyeodiwe [5] as cited in monogbe [2], opined that Nigeria is a country with high currency risk. In their study, a significant and positive correlations between foreign direct investment and exchange rate in Nigeria was revealed. This implies that depreciation of the naira increase real inward foreign direct investment into the country.

Methodologically, Different studies in literature with different method tend to produce different results. The challenge with previous studies is the inconsistent results on the inter-relationship between interest rate, exchange rate and foreign direct investment inflows, usually caused by discrepancies in study frame, sample country and utilized variables by individual scholars. For instance, Campa [6]; Froot and Stein [7]; Brzozowski [8] focuses more on the impact of foreign Direct Investment, Exchange Rate and Interest Rate while the control variable was ignored thereby limiting the study to the Ordinary Least Square Estimation Technique, [9]; Hsiao and Hsiao [10]; and Toda and Yamamoto [11] e.t.c who employed the use of causality, volatility check and co-integration failed to put to good use timely and up to date data. It is on this backdrop that this study tend to amplify the Chemistry between direct investment, exchange rate, Interest rate and economic development in Nigeria using ARDL model between the periods 1986 to 2015.

THEORETICAL UNDERPINNING

Microeconomic Theory of Foreign Direct Investment

Hymer's theory states that the main intentions for internationalization of companies are: variables connected to the company's ownership of specific assets and dimension; and variables caused by existence of market inefficiencies. Hymer stated that "foreign direct investment is beneficial when firm-specific advantages across nations allow overcoming additional costs of doing business abroad". Moreover he opined that it is economical for international companies with specific advantage to operate successfully outside their own country. Hymer further asserts that foreign direct investment brings about technological advancement, helps the inflow of new features of production; also the acquisition of additional skill and expertise helps to enhance and advance other production processes. These advantages are inextricably linked from one department of a company to another irrespective of their location in one nation or more [12].

Classical Theory of Interest Rate

The classical theory of interest rate advocates that "the interest rate is the factor that brings the demand for investment and the readiness to save into equilibrium with one another". Thus, interest rate is the price that connects the demand for investment fund and supply of savings. The price of a product is automatically fixed at that point where the demand for it is equal to the supply, interest rate in a country also comes to rest in-line with the play of market forces at the point where the level of investment at that rate of interest is equal to the amount of saving at same rate [13]. The classical theory never considered the significance of monetary factors like cash, credit, hoardings etc. The fact that the demand for money may also emanate from the desire to hoard, was not given any attention in the classical theory of interest rate. It regarded interest as the function of saving and investment might be expressed as $i = f(S, I)$ [14].

Exchange Rate in Nigeria

In 1986, the Structural Adjustment Programme (SAP) brought about the foreign exchange market deregulation. The deregulation process introduced market determined and managed floating rate regime. Prior to the implementation of this program, Nigeria operated a fixed exchange rate regime, sustained by exchange control regulations that created major economic problems till date. Most of the industries in Nigeria depend solely on importation of natural resources, basic materials and finished goods from foreign countries, the CBN usually interfere in the foreign exchange market through its monetary policies and operations in the money market to tilt the exchange rate variability in the desired path such that it raises the competitiveness of the domestic economy. Today exchange rate in Nigeria is determined through the instrument of efficient resource allocation between any interacting economies by the means of import and export (BOP) which invariably affect the demand of the country's currency. Nigerian as an import dependent country was seriously affected by the deregulation exercise. The value of naira depreciates as a result of high degree of currency risk; recurrent changes in exchange rate and inflation.

Review of Related Literature

Yousaf, Shahzadi, Kanwal and Hassan, [15] examined the "influence of exchange rate movement on Foreign Direct Investment in Pakistan." between the periods of 1980 to 2011. Their study used ordinary least square regression (OLS) model along with diagnostic analysis. They established that "exchange rate shocks and inflation rate averts Foreign Direct Investment while a positive correlation exist between exchange rate and FDI".

Ellahi [16] investigated the impact of exchange rate volatility on FDI inflow in Pakistan between 1980 to 2010. Employing Autoregressive distribution lag (ARDL) model. The result clearly showed that the volatility of exchange rate has a negative impact on FDI inflow on the short run and positive impact in the long run in Pakistan economy.

Monogbe [17] amplified the behavioural effect of multination operations and its performance on the Nigeria economy between the periods 1986 to 2014. Study employed error correction model and impulse response method among others. Report shows that the operation of the multinational firm has significantly contribute to the growth of the Nigerian economy thought the contributive quadrant is minuet and as such the mangers of the Nigerian economy should put in place strategies that will attract foreign investors to ensure more inflows of foreign capital in the country.

Momodu and Monogbe [18] amplified the determinant of industrialisation and economic development in Nigeria using series of econometrics estimating tools. Study reveals that of the five explanatory variables under investigation, three of those variables were established to be an adequate drivers of industrialisation. On that premises, the study concluded that foreign direct investment, exchange rate, net export and aggregate bank lending are significant drivers of industrialisation in the Nigeria context. Hence, the study recommends that more effort be put in place to resuscitate the dormant industrial firms in the country as they appear to be a key contributor to sustainable economic development.

Wang and Wong (2009) studied Foreign Direct Investment and economic growth; they employed data from 69 nations between 1970 to 1989 under two economic situations; "human capital and well-developed financial markets". They discovered the extent of the correlation between foreign direct investment and growth, they noted that these two situations could be fundamentally different catalysts for foreign direct investment to stimulate economic growth from the viewpoint of growth accounting.

Arodeoye and Iyoha [19] investigated the relationship between foreign trade and economic growth in Nigeria, utilizing a quarterly time-series data for 1981 Quarter 1 through to 2010 Quarter 4. Using the vector autoregressive model is utilized. They discovered that there is a stable, long- run relationship between foreign trade and economic growth. It was discovered that the major sources of Nigeria economic growth variation are due largely to "own shocks" and foreign trade innovations.

Sadia *et al* [20] evaluated the role of trade openness, inflation, imports, exports, real exchange rate and foreign direct investment in enhancing economic growth in Pakistan. The analysis based on time series data for the period 1980 to 2011. This paper uses ADF; PP and DF-GLS tests to find out stationarity of the variables and Co-integration and DOLS (Dynamic Ordinary Least Square) techniques have been used for the estimation. Co integration results indicated the long run relationship among the variables.

Kakar and Khilji [21] examined the role of trade openness and foreign direct investment in relation to economic growth for Pakistan and Malaysia for the period 1980-2010. Johansen co-integration test was used in estimating the nature of relationship and Granger causality test was used to determine the direction of causality in the model. Results showed that in the long run trade openness positively effects the economic growth in both Pakistan and Malaysia.

Zakaria *et al* [22] studied the impact of trade liberalization on foreign direct investment in Pakistan using quarterly data from 1972 to 2010. The findings suggest that there is a significant positive relation between trade liberalization and FDI. The results indicate that the factors that drive foreign investment have a differential impact on FDI flows to Pakistan.

Alaba [23] examined exchange rate volatility and foreign direct investment in Sub Sahara Africa economies between 1982 and 1998. He adopted GARCH model and error correction technique. His result revealed that exchange rate volatility was not significant for foreign direct investment inflows in both agricultural and manufacturing segment of Nigeria.

Ogunleye [24] investigated exchange rate volatility and foreign direct investment in Sub Sahara Africa (SSA), they investigated nine countries in the region, Country-specific time series data and panel model estimation techniques were employed. He establish "that exchange rate instability generally limits foreign direct investment inflows to SSA.

Udoh and Egwaikhide (2008) investigate "the impact of exchange rate volatility and inflation certainty on Foreign Direct Investment in Nigeria, between the periods of 1970 to 2005. Adopting the Generalized Autoregressive Conditional Heteroskedastic (GARCH) estimation model. They concluded that exchange rate uncertainty have a negative impact on foreign direct investment inflows in Nigeria.

Yousaf, Shahzadi, Kanwal and Hassan, [15] examined the "influence of exchange rate movement on Foreign Direct Investment in Pakistan." between the periods of 1980 to 2011. Their study used ordinary least square regression (OLS) model along with diagnostic analysis. They established that "exchange rate shocks and inflation rate averts Foreign Direct Investment while a positive correlation exist between exchange rate and FDI".

Ellahi [16] investigated the impact of exchange rate volatility on FDI inflow in Pakistan between 1980 to 2010. Employing Autoregressive distribution lag (ARDL) model. The result clearly showed that the volatility of exchange rate has a negative impact on FDI inflow on the short run and positive impact in the long run in Pakistan economy.

According to Han and Ray [25] they examined the impact of exchange rate movement and stock performance on foreign direct investment inflows into Nigeria, adopting ordinary least square regression model and error correction technique, using time series data between 1980 to 2013, their findings revealed that there exist a balance framework between exchange rate volatility and returns, capital flows and equity returns.

However, Campa [6] studied Relationship between exchange rate volatility and FDI. The study opined that the investor's choice on investment abroad is based on the premise of expected future profitability from such investment. Consequential to this, Campa's models foretell "that an appreciation of the host country's currency will increase FDI into the host country". This study disagree with Froots and Stein [7] conclusion.

Blonigen [26], investigated "Firms specific assets and the link between Exchange Rates and Foreign Direct Investment", he used Japanese asset acquisition data in United States of America between 1975 and 1992, he opined that exchange rate can influence the acquisition of foreign direct investment since it involves acquisition of organization's specific assets in other country's currency which can yield profit in another currency.

METHODOLOGY

Research methodology refers to ways that the research study shall be presented. Hence, this section amplified the procedures chosen to gather the relevant data needed for the study, as well as the data analysis itself. This study intends to find the Chemistry between direct investment, exchange rate, Interest rate and economic development in Nigeria using ARDL Approach

Operational Measures of Variables

Interest Rates for Nigeria

Annual official interest rate will be proxy for INT as obtained in CBN statistical bulletin. This study utilized the nominal interest rate. Interest rate can also be either nominal or real. The real interest rate, which measures the purchasing power of interest receipts adjust nominal interest rate to account for inflation. Nominal interest rate is the rate quoted by banks and the financial press.

Exchange Rates for Nigeria

Annual official naira/dollar exchange rate will be proxy for Exchange Rate as obtained in CBN statistical bulletin.

Exchange rate can also be either nominal or real. The nominal exchange rate quoted by financial institutions and financial press is the value, price or worth of naira in terms of foreign currency, while the real exchange rate is the relative price of Nigerian goods in terms of foreign goods.

Foreign Direct Investment for Nigeria

Annual official foreign direct investment data as obtained in CBN statistical bulletin will be proxy for FDI. The global economy is characterised on one country depending on another, which means that goods produced in one country will find its way to many other countries in the world. Foreign direct investment is an investment offshore which is aimed at profitability and cost minimization.

Human development Index

This is a proxy for economic development, it is a composite statistic life expectancy rate, mortality rate education, and income per capita indicators, which are used to rank countries into four tiers of human development.

Model Specification

The theoretical base of this study is Aliber's [27] theory on foreign direct investment based on strength of various currencies. He opined that any economy with weak currencies compared with country with stronger currencies has a higher capability to attract foreign direct investment in order to take lead of differences in the market capitalization rate.

Autoregressive distributive lag (ARDL) mechanism is used basically on two condition. When the number of observation or sample size under consideration is small or below 25 years altogether, then ARDL mechanism is adequate and secondly, when there is a mixed stationarity response of the time series under investigation. That is when data became stationary at order 1(1) and order 1(0), Autoregressive distributive lag (ARDL) mechanism is appropriate. On this premises, Autoregressive distributive lag (ARDL) mechanism could be designed mathematically thus ,

$$yt = ßo + ß1t \sum_{i-1}^{p} øi \;\; yt-1 \; + \; ß\,xt + \sum_{i-0}^{p} ß_1 + \Delta xt - 1 + \pi t \qquad (1)$$

Where x_t represent the dimension of 1(1) variable which are not stationary $ß_1$ represent the matrix which makes autoregressive process stable while πt is the error term [17].

For the purpose of this work, we designed our model in the functional form thus

HDI = f (FDI, INTR, EXCR) (2)

The model is further recast into ARDL econometrics form thus;

$\log HDI_t = a_0 + \sum_{i=1}^{p} a_{1\log} HDI_{t-I} + \sum_{i=1}^{p} a_{2\log} FDI_{t-i} + \sum_{i=1}^{p} a_{3\log} INTR_{t-i} + \sum_{i=1}^{p} a_4 \log EXCR_{t-i} + ∂_2 FDI_{t-I} + ∂_3 INTR_{t-I} + ∂_4 EXCR_{t-I} + \pi t$.....(3)

a_0 is the intercept, α t-I where i=1,2,3,4 signifies short term coefficients which reflects short term effect of exogenous variables on economic development and $∂_{2,3,4}$ reflect the long term co-integration coefficient of the exogenous variables which affect the endogenous variable.

Where

HDI = Human Development Index

FDI = Foreign Direct Investment

INTR = Interest Rate

EXCR = Exchange Rate

a_0 = Constant Parameters

$a_1, a_2, α_3, α_4$ = Estimation parameters

πt = Error term

On a priori $a_1, a_2, α_{3>0}$

DATA PRESENTATION AND ANALYSIS

Considering the fact that time series data are prone to stationarity problems, Gujarati and Porter (2009) advice that time series data should be subjected to stationarity test to ensure reliability of such data set. Sequel to this connotation, we subject our data to stationarity test using Dickey fuller unit root test.

Table 1: Presentation of Unit Root Output

Variables	ADF stat	critical value	P-value	Order of integration
LOG(HDI)	**-7.03324**	**-2.95711**	**0.0001**	**1(0)**
LOG(FDI)	**-6.33602**	**-2.95711**	**0.0001**	**1(1)**
LOG(INTR)	**-5.37304**	**-2.96041**	**0.0376**	**1(0)**
LOG(EXCR)	**-4.84536**	**-2.95711**	**0.0004**	**1(1)**

Source: Extraction from E-view Output

The result of the stationality test presented in the table above shows a mixed response of stationarity trend of the time series under investigation. FDI and EXCR became stationary in the order of 1(1) integration while INTR and HDI became stationary in the order of 1(0) which suggest a compliance to ARDL conditions.

Table 2: Presentation of Bound Test Co-Integration Output

ARDL Bounds Test		
Date: 03/08/17 Time: 11:01		
Sample: 1984 2014		
Included observations: 31		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	1.777398	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Extraction from E-view output

Bound co-integration test is employed to examine the extent to which the time series under investigation are co-associated in the long run. The decision rule here states that, if the F-statistics value is greater than the upper and the lower bound statistics at all level, we reject the null hypothesis and thus conclude that this is a long run association among employed variables if otherwise, we do not reject. From the result presented in table 2 above it is obviously clear that the F-statistics is lower than the lower and upper bound value at all level. Hence, we do not reject the null hypothesis. Therefore we conclude that there exist no long run association among the variables under investigation.

Table 3: Estimation of Long Run Coefficient Using ARDL Mechanism

Dependent Variable: LOG(HDI)				
Method: ARDL				
Date: 03/08/17 Time: 11:38				
Sample (adjusted): 1982 2015				
Included observations: 33 after adjustments				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic): LOG(FDI) LOG(EXCR) LOG(INTR)				
Fixed regressors: C				
Number of models evalulated: 8				
Selected Model: ARDL(1, 1, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(HDI(-1))	0.667060	0.111400	5.987949	0.0000
LOG(FDI(-1))	0.022986	0.008390	2.739556	0.0110
LOG(EXCR(-1))	-0.159825	0.035569	-4.493377	0.0001
LOG(INTR(-1))	0.085063	0.038393	2.215609	0.0357
C	-0.430135	0.176524	-2.436700	0.0220
R-squared	0.785478	Mean dependent var		-0.660259
Adjusted R-squared	0.735973	S.D. dependent var		0.114126
S.E. of regression	0.058642	Akaike info criterion		-2.648894
Sum squared resid	0.089411	Schwarz criterion		-2.331453
Log likelihood	50.70675	Hannan-Quinn criter.		-2.542085
F-statistic	15.86665	Durbin-Watson stat		2.537341
Prob(F-statistic)	0.000000			

Source: Extraction from E-view output

The result above tend to amplify the long run influx among employed variables using lag one as suggested by the model selection method. At lag one, if all other variables are held constant, economic development index will increase to the tune of 0.6670 all things been equal. Furthermore, foreign direct investment report a positives and significant relationship to economic development in Nigeria. FDI exhibit a significant P-value of 0.0110 with a coefficient value of 0.022982 which suggest a direct relationship between foreign direct investment and economic development in Nigeria. One can empirically

say that a percentage increase in the inflows of direct investment is capable of stimulating economic development in Nigeria to the tune of 0.02298 accordingly. Interest rate also report a significant relationship to economic development as it P-value stood at 0.0357 with a corresponding coefficient of 0.08506. The influx between interest rate and economic development is against theoretical postulation. Theoretically, we expect interest rate to be negatively significant in stimulating economic development but the result report otherwise. Against all odds, This result suggest that the high rate of interest promote investment paradox and thus stimulate economic development in Nigeria while the report from the exchange rate shows that if exchange rate is appreciating, economic development is been stimulated. This therefore suggest that an appreciating exchange rate is capable of attracting foreign investors and thus promote economic development as the case may be. The inter-relationship between exchange rate, direct investment and economic development is expected to be direct accordingly such that rise in exchange rate attract direct investment and thus promote economic development in Nigeria.

From the global statistics, the adjusted R^2 exhibit a viable coefficient of 0.7359 which suggest that about 74% variation in the dependent variable is jointly explained by the explanatory variables while the Durbin Watson statistics reflect an absence of auto correlation. The F-statistics and the probability value shows the significances of foreign direct investment and interest rate accordingly judging by their significant P-value of 0.0110 and 0.0357 respectively.

Diagnostic Test

Table 4: Presentation of LM Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.707089	Prob. F(2,24)	0.2027
Obs*R-squared	4.109839	Prob. Chi-Square(2)	0.1281

Sources: Extraction from E-view output

LM serial correlation test was conducted in fulfilment of the condition of classical liner regression model assumption in consonant with econometrics modelling. The decision rule here is that if the Obs R-square is greater than the 5% level of significant, were reject the null hypothesis and if otherwise, we do not reject. From the result presented above, we found that the Obs R-square is greater than the selected level of alpha (0.1281>0.05). Hence, we do not accept the null hypothesis and thus conclude that there is absence of serial correlation.

Table 5: presentation of Heteroskedasticity Test Output.

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.359189	Prob. F(6,26)	0.8979
Obs*R-squared	2.525986	Prob. Chi-Square(6)	0.8655
Scaled explained SS	0.991669	Prob. Chi-Square(6)	0.9859

Extraction from E-View Output

From table 5 above, we observe absence of heterosckedasticity judging by the probability chi-square value of (0.8655) which is greater than 5% alpha level. Hence we conclude that there is an existence of homosckedasticity which suggest that our residual are normally distributed and thus in consonant with classical linear regression model assumption (CLRMA).

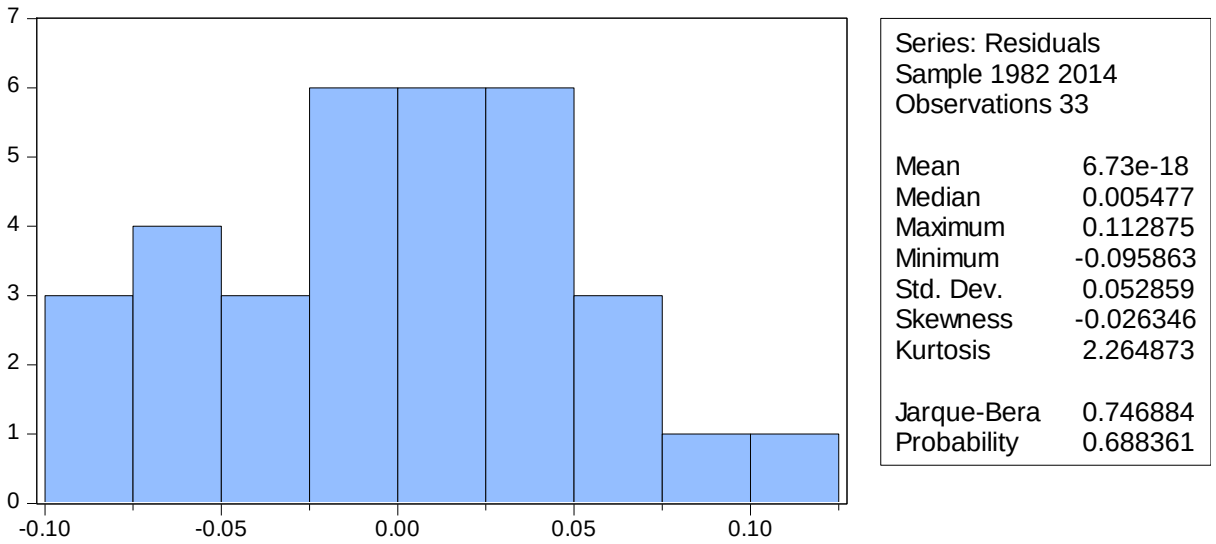

Fig-1: Presentation of Jarque Bera Normality Test output

Source: Extraction from E-view 9 output

The result of the jarque bare test above reveals that the jarque bare probability value stood at 0.68836 which is greater than 5% alpha level thus suggest that our residual are normally distributed and thus justifying the fitness of our model. The variables under consideration are all negatively skewed towards normality and are all playokultic in nature.

Table 6: Presentation of Causality Test

Pairwise Granger Causality Tests			
Date: 03/08/17 Time: 13:46			
Sample: 1981 2014			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(FDI) does not Granger Cause LOG(HDI)	32	0.67004	0.5200
LOG(HDI) does not Granger Cause LOG(FDI)		1.04800	0.3645
LOG(EXCR) does not Granger Cause LOG(HDI)	32	0.89753	0.4194
LOG(HDI) does not Granger Cause LOG(EXCR)		0.19317	0.8255
LOG(INTR) does not Granger Cause LOG(HDI)	32	0.09798	0.9070
LOG(HDI) does not Granger Cause LOG(INTR)		2.60102	0.0927

Source: Extraction from E-view output

The result of the causality test above reveals the absence of neither uni nor bi causal relationship among employed variables under investigation. The result further validate the report from the ARDL bound test and thus implies absence of long run relationship among the variables under consideration.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study seek to amplify the chemistry between foreign direct investment, exchange rate, interest rate and economic development in Nigeria between the periods 1986 to 2015 using ARDL model. From the statistical report, we discovered that foreign direct investment and interest exhibit a direct relationship to economic development in Nigeria. This suggest that rise in foreign direct investment is capable of promoting economic development in the Nigerian context to the tune of 0.0229 while the report from the interest rate is against our a priori expectation. Theoretically, we expect interest rate to be negatively significant in stimulating economic development in Nigeria but the result report otherwise. Against all odds, This result suggest that the high rate of interest promote investment paradox and thus stimulate economic development in Nigeria while the report from the exchange rate shows that if exchange rate is appreciating in favour of naira, economic development is been stimulated. This therefore suggest that an appreciating exchange rate is capable of attracting foreign investors and thus promote economic development as the case may be. The inter-relationship between exchange rate, direct investment and economic development is expected to be direct accordingly such that rise in exchange rate attract direct investment and thus promote economic development in Nigeria. The

policy implication is that if Exchange Rate appreciates, then Naira will be cheap relative to other currencies, this can attract Foreign Direct Investment inflow into the Nigerian economy through the window of reduce Naira value and cheap investment in Nigeria. This also validates the position of Salako and Adebusuyi [28] whose study examined the empirical determinants of FDI in Nigeria. Their findings revealed that exchange rate is one of the major determinants that encourage the inflow of foreign direct investment into a nation. Based on this findings, study recommends the following,

- Managers of Nigeria economy should in an attempt to attract inflow of foreign direct investment Normalise The domestic business environment in such a way that local producer will be encourage through high patronage and the level of environmental, political and ethnical hazard should be curtail to a dearest minimal as this will help to cushion the export tendency of the nation and thus ensure favourable balance of payment.
- The result also revealed that the relationship between interest rate and human development index is against a priori expectation; interest rate is expected to affect economic development. Thus, authorities in charge of managing the Nigerian economy should as a matter of urgency revamp the lending rate by introducing low interest rate as this will make it cheaper to borrow and this encourages spending and investment lending to higher aggregate demand which will further stimulate economic development.

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