Trade Liberalization and Capital Flows in Nigeria: A Partial Equilibrium Analysis

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Abstract: *This study explores the link between trade liberalization and Capital flows in Nigeria between 1986 and 2015. The objectives were to:determine the effects of level of trade openness, tariff reduction, exchange rate differential and economy size on foreign direct investment in Nigeria. The required datasets were adapted from World Bank World Development Indicators, United Nations Conference on Trade and Development and Central Bank of Nigeria Statistical Bulletin. The study adopted a partial equilibrium analysis with focus on foreign direct investment as the most stable form of capital flows and relying on Autoregressive Distributed Lag model. Evidence from the ARDL bounds test for cointegration result indicates that long run relationship existed among the variables. It results showed that trade openness has significant negative impact on FDI in the long run but tariffs and exchange rate differentials impair FDI flows to Nigeria. In contrasts, the size of the Nigerian economy captured by real gross domestic product is significant in mobilizing foreign direct inflows into the country. This is indicative that Nigeria's position as the economic giant in the sub-Saharan African is key in the decision of foreign investors to invest in the country. Owing to the findings, this study recommends that stabilize exchange rate and improve on tax reforms and enhance total libralisation of the economy.*

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I.   Introduction

The design and implementation of policy reforms in terms of reducing or eliminating barriers and other constraints to trade to stimulate capital flows in many countries, especially developing economies has received greater attention in both policy and academic cycles. Proponents of trade liberalization argue that it provides incentives for capital inflows which generate positive externalities by stimulating competition and efficiency in the domestic economy. Trade liberalization policy is often designed to open up the economy to foreign investment and reduce barriers to trade through the reduction or removal of tariff (Mukhopadhyay and Chakraborty, 2005).

It is noteworthy that from the postulations of international trade theories countries are better-off in a regime of free trade than in autarky considering various levels of specialization in production which they enjoy comparative advantage. The neoclassical theorists argue that capital flow from rich countries to poor countries given the high marginal productivity of capital in the latter. However, Lukas (1990) found no evidence to support this assumption as the structural rigidities add to the factors that constrained free flow of capital. Nevertheless, many researches such as Antras and Caballero (2007)and Shah and Samdani (2015) amongst others have given credence to trade integration as ideal policy for any economy, especially a developing one given that it provides basis for improved output growth and inflow of capital. Although trade liberalization tends to contract the fiscal ability of government through reduction in tariffs and other duties, the benefits associated with it outweigh its costs (Ude and Agodi, 2015).

Trade policies in most countries, especially developing economies have favoured trade integration at the expense of protectionist policy. However, controversies still exist on whether or not countries are better-off with the adoption of liberalization policies. Notably, many developing economies embraced outward economic reforms in the 1960s and 1980s at the expense of protectionist policies (Galan, 2006). The Nigerian economy is not an exception as the Structural Adjustment Programme (SAP) adopted in 1986 allowed for relatively more open economy due to the adoption of trade liberalization and other associated deregulation policies. Ude and Agodi (2015) opine that the broad based trade liberalization and realistic exchange rate management system associated with the Structural Adjustment Programme in Nigeria resulted to increase in total trade as a ratio of gross domestic product from 0.21 percent to 0.64 percent in 1986 and 1987 respectively and expanded to 18.8 percent by 1997. However, policies relating to inflow of foreign resources, especially foreign direct investment (FDI) to Nigeria have since been liberalized with the adoption of Structural Adjustment Programme. However,

empirical evidences from different researches indicate that the associated benefits are not very impressive. This is a pointer that the Nigerian economy has not optimally benefited from the outcomes of the outward-oriented policy reforms. Schadler (2008) as cited in Masahiro and Shinji (2008) posits that FDI is considered being very desirable among long-term flows given that they are closely linked to underlying real considerations and seem difficult to reverse. On the other hand, inflows of foreign portfolio investment are viewed as very volatile given its high sensitivity to market fluctuations.

Yusuf, Malarvizhi and Khin (2013) argue that trade liberalization in the face of infrastructural rigidities; inefficient productive base and poor human capital may generate undesirable effects in the process of growth in Nigeria. These tend to pose serious challenges to the sustainability of liberalization policy due to the growing marginal propensity to import in the absence of diversifiedexport base. However, with an outward looking policy initiative in the form of trade integration, the Nigerian economy tends to provide opportunity for the inflows of capital to meet the savings-investment gap and overcome other structural macroeconomic problems. The extent to which the outward-oriented trade policy in Nigeria has stimulated capital flows with regard to FDI remains a source of concern to policy makers and other relevant stakeholders in the economy. This has prompted questions such as: Does trade liberalization spurs capital flows to Nigeria? Do trade integration and capital flows in Nigeria have long-run relationship? In the light of the above, the thrust of this paper is to provide appropriate answers to these questions and more through an empirical analysis of the link between trade liberalization and capital inflows to Nigeria.

1.2 Statement of the Problem

The structural macroeconomic imbalance prevalent in developing economies in the 1980s necessitated the adoption of trade liberalization polices in most developing economies including Nigeria. The anticipated economic turnaround to be associated with policy reforms were so high following the prevailing neo-liberal, but seemingly misleading assumptions that it would enhance free flow of goods, investments, technology and capital necessary to stimulate industrialization and overall growth of the economy (Onuegbu, 2015).The policy thrust of trade integration in Nigeria focuses on engendering sustainable growth through diversification of the export base from oil-oriented to real sector-driven. Unfortunately, the problem tend to persist as oil remains the key driver of Nigeria's exports accounting for over seventy percent of Nigeria's export earnings in the Post SAP era (Amuka, Agu, and Ojike, 2013). Again, it is worrisome that infrastructural rigidities and economic disincentives in terms of multiple tax system, policy inconsistency and insecurity among other bottlenecks impair capital flows to Nigeria despite the adoption of trade liberalization policy.

It is important to note that the Structural Adjustment Programme that necessitated the liberalization of trade in Nigeria following the neoliberal logic of the Washington consensus limited government participation in the economy to regulatory functions. Also, inconsistency and poor control mechanism that characterized fiscal and monetary policy frameworks associated with trade liberalization tend to constrain capital flows to Nigeria. This is in accordance to the assertion of Wilson (2005) that there is disconnect between Nigeria's economic reform agenda and regulatory forces as well as legal institution required to engender competitiveness and development. However, despite policy actions, especially trade integration geared towards encouraging capital flows, the trend of foreign direct investment in Nigeria as the most stable form of capital flows has not been impressive. Egwuatu (2014) posits that FDI decreased from 235.2 billion naira in the second quarter of 2013 to 137.6 billion in the third quarter of 2013. Again, the United Nations Conference on Trade and Development (UNTAD, 2015) reports that FDI in Nigeria witnessed negative growth of 27 percent in 2014. Thus, controversies abound on the effectiveness of trade liberalization in encouraging inward FDI. Accordingly, this paper seeks to explore the effects of trade openness, exchange rate differential, tariffs and economy size on FDI inflows into Nigeria.

Thespecific objectives of this study were to: determine whether long run relationship exists among capital flows, level of trade openness, exchange rate differential, tariff and economy size and whether Long run relationship exists among capital flows, level of trade openness, exchange rate differential, tariff and market size in Nigeria..

II. Review Of Related Literature

2.1 Theoretical Literature
i. Heckscher-Ohlin Theory

The Heckscher-Ohlin theory emerged from the publication of Eli Heckscher and BertilOhlin which offered deeper insight into the rationale for the comparative advantage enjoyed by countries in the production of different commodities. According to them, countries enjoyed comparative cost advantage because they have different factor endowments. This is a pointer that some countries are rich in capital while some are richly endowed with labour resources. Their view of factor endowment followed two approaches which include:

Factor ratio: In terms of factors ratio, a country is considered to be labour abundant if the ratio of the total amount of labour to the total amount of capital is greater compared to other country. This necessitates the production and export of labour-intensive goods by this country. Assuming there are two countries (X and Z) and two factor inputs [capital (K) and labour (L)]. Based on Heckser-Ohlin assumptions, country Y is labour abundant if $(^L/_K)Y > (^L/_K)Z$. Conversely it follows that country Z is capital abundant if $(^K/_L)Y < (^K/_L)Z$. This requires each of them to specialize in the production of the commodity they enjoy comparative advantage given their relative factor endowments.

Factor Price: As regards to factor price, a country is labour endowed if the ratio of the price of labour is lower compared to the other country. Both the demand and supply of labour as an abundant factor input is captured by this criterion. Using the previous example of two countries (Y and Z) and two factor inputs (Labour and Capital), country Y is labour abundant if $\left(\frac{PL}{PK}\right)Y < \left(PL/_{PK}\right)Z$ while country Z is capital abundant if $\left(PL/_{PK}\right)Y > \left(PL/_{PK}\right)Z$.

The Heckscher–Ohlin model stipulates that a country will export the commodity whose production requires the intensive utilization of the country's relatively abundant and cheap input and import the commodity which requires the utilization of the relatively scarce and expensive input in the production process. Clarke and Kulkarni (2009) opine that the publication of Heckscher-Ohlin proposed that nations in possession of abundant capital would export capital-intensive goods and import labour intensive goods, while countries that are labour-abundant would export labour intensive goods and import capital-intensive goods. The Heckscher-Ohlin theory states that trade will increase the demand for commodities produced by a country's relatively abundant and cheap resources (Ince, Kozanoglu and Demir, 2011).

More importantly, the Heckscher-Ohlin model is based on the existence of two countries, two products and two factor inputs (2x2x2) model. The exchange of goods internationally is therefore indirect factor arbitrage which enhances transfer of services of otherwise immobile production factors from regions of factor abundance to regions where factor inputs are relatively scarce (Leaner, 1995).

However, despite various impressive clarifications provided by Heckscher-Ohlin model, it is been criticized for making some unrealistic assumptions in terms of the existence of homogenous production function, constant return to scale and absence of qualitative disparity in factor inputs among others. Again, the two countries, two commodities and two factor inputs (2x2x2) model proposed by the theory is very restrictive considering the existing realities in the contemporary world.

ii. Neoclassical Theory of Capital Flows

This basic assumption of the neoclassical theory is that capital flows from rich to poor countries. This is based on the standard assumption that there exist constant return to scale and the same factor inputs. Therefore, if capital is allowed to flow freely, new investments would be created only in the poorer country (Alfaro, Kalemli-Ozcan and Volosovych, 2008).

The saving-investment gap is narrowed through the inflow of capital to developing countries which stimulates the level of economic activities. However, the predictions of the neoclassical theory appear to be unrealistic which consequently generates paradox in international macroeconomics.

iii. Lucas Puzzle-Theory

The Lucas Puzzle theory often referred to as the "Lucas Paradox" emerged from the seminal paper of Robert Lukas in 1990. It argues that the postulation of neoclassical economists on free flow of capital from rich to poor countries is unrealistic. The neoclassical theory assumes that given the diminishing returns of capital, it should flow from the capital-sufficient countries to capital-deficit countries. To this effect, the neoclassical theorists predict that investors in developed countries channel their investments to poor countries considering the high potential of profitability in these countries.

However, Lukas (1990) publication of "Why doesn't capital flow from rich to poor countries" revealed that the assumptions of the neoclassical economists about marginal product return differentials between rich and poor countries as determinant of capital flows were not true. Lukas compared the United States and Indian economy and found that, if the neoclassical theory were reliable, the marginal product of capital in India should be 58 times that of the United States (Alfaro, Kalemi-Ozcan and Volosovych, 2003). This implies that investment in India should be highly attractive from the United States' viewpoint. Unfortunately, Lukas did not observe these differences in marginal product of capital which necessitated questions about the validity of the neoclassical assumptions and the possible assumption that could replace it. Joffe (2014) describes this as the key question for economic development.

More broadly, the possible reasons for this discrepancy as observed from the Lukas paradox followed two outstanding theoretical explanations which include:

- **Differences in the fundamentals that affect the production structure of the economy:** Thedifferences in macroeconomic fundamentals involve omitted factor inputs, government policies and institutions (Alfraro, Kalemi-Ozcan and Volosovych, 2003). Omitted factors of production in the forms of human capital and land that positively influence the returns to capital determine capital flows from rich to poor countries. Given that human capital positively influence the return to capital, less capital tends to flow to countries where human capital endowment is low. Non-investment accommodating government policy in the form of multiple taxes can obstruct the inflows of capital and marginal returns to capital. The societal institutions such as traditions, customs and formal rules are identified in the Lukas' seminal paper as constraints to flow of capital from developed to developing economies.
- **Imperfections in International capital market:** The Second theoretical explanation for discrepancy in flow of capital from developed to developing economies is the prevalent imperfections in the international capital market which mainly involve asymmetric information and sovereign risk among others. The problem of asymmetric information persists due to the inability of foreign investors to adequately access information concerning domestic market which constrains their tendency to invest in poor countries. Also, it involves the inability of lenders to monitor borrowers' investment. Moreover, the sovereign risk which is concerned with default on loan contracts with foreigners, seizure of foreign assets located within a country or preventing nationals from fulfilling obligations to foreign capital affect capital flows from rich to poor countries.

According to Reinhardt, Ricciard and Tressel (2013), the premise of the classic paper of Lukas (1990) asserts that very little capital flows from rich to poor economies, compared to the assumptions of the neoclassical theory which is classified as Lukas paradox. Undoubtedly, Lukas rejected the neoclassical model as he finds no empirical evidence to support it. In support of this, Franken and Wijnbergen (2010) posit that assuming discrepancy in capital intensity are the determinant of income differences, capital should flow from rich to poor economies, given that marginal productivity of capital is negatively related to capital intensity in the Solow-Swan framework.

2.2 Empirical Literature

Several studies across the globe have tried to investigate the link between trade liberalization and capital flows. These researches are predicated on the postulations of international trade and capital flow theories in evaluating the perceived link between the variables. However, the findings that emerge from these earlier studies are characterized by controversies. For instance, some of these studies show evidence of positive impact of trade integration on capital flows while others reveal that trade integration contracts capital flows. The review of these earlier works is provided below:

Antras and Caballero (2009) assessed the implications of trade integration on capital flows in less financially developed economies. The study is based on the theoretical assumption that trade integration provides the required incentives for capital mobility in developing countries. The result shows that trade integration in developing economies increased net capital inflows. The study concludes that protectionism as a capital flow rebalancing policy is detrimental to the process of growth and development in the developing countries.Goldar and Banga (2009) examined the implications of trade liberalization on foreign direct investment in Indian industries. An econometric method was adopted in analyzing the panel data sourced from 78 industries for the post reform period. The results reveal that the foreign direct investment is vertically integrated as industries with higher cross border trade attracted high foreign direct investment. The study concluded that foreign equity inflows are largely dependent on the dynamic nature of domestic firms.

Azam et al. (2010) explored the impact of institutional factors and macroeconomic policy reforms, especially credible trade liberalization on inflows of foreign direct investment in seven South Asian economies which spanned through a twelve-year period (1996-2007). Panel data were obtained for each of the countries and the Ordinary Least Squares (OLS) was employed as the analytical tool. The results show that poor macroeconomic policy in the form of incredible trade integration generated negative effect on inflow of foreign direct investment. The study recommended for the incorporation of political and economic policy reforms into the broad policy objective of attracting foreign direct investment.

Franken and Wijnhergen (2010) appraised the determinants of capital flows to low income countries between 2000 and 2006. The estimation method employed for analyzing the panel data is standard unconstrained Classical Least Squares approach. It was evident from the findings that level of trade openness remains one of the most important country-specific drivers of private capital flows. The study concludes that open economies attract foreign direct investment as the Lukas paradox does not seems to hold for foreign direct investment.Liargovas and Skandalis (2011) investigated the effectiveness of trade openness in stimulating inflows of foreign direct investment in 36 developing economies globally between 1990 and 2008. Specifically, the countries covered cut across Africa, Commonwealth Independent States, Latin America, Asia and Eastern Europe. The panel regression results revealed that trade openness has a long-run positive impact on inflow of

foreign direct investment. The study suggested for proactive measures to be put in place to ensure that the liberalization policies provide the necessary incentives for capital inflows.

Adams (2013) investigated the effectiveness of trade liberalization policy in stimulating inflow of foreign direct investment in 29 Sub-Saharan African economies. Cost of import and export as well as direction and the number of required documents for the completion of trade transaction were used as measures of trade liberalization. Both static and dynamic estimation tools were employed in analyzing the perceived relationship among the key variables. Evidence from the results indicates that policy of openness is positively related with foreign direct investment. The study recommended for conscious policy actions to be directed towards reducing cost of trade to enhance free flow of commodities across national boundaries.

Khan, Adnan and Hyee (2014) analyzed the impact of economic liberalization on the inflow of foreign direct investment in Pakistan. Both financial and trade liberalizations were used as measures of overall liberalization and the data obtained covered the period of 1971-2009. The order of integration in each of the variables were analyzed using Dickey Fuller Generalized Least Square test while Autoregressive Distributed Lag model was adopted to ascertain the existence of long-run relationship between the variables. The findings show that the two indicators of liberalization, financial and trade openness as well as real interest rate negatively impacted on inflows of foreign direct investment in Pakistan. Thus, the study suggested that the liberalization policy in emerging economies should be associated with concerted efforts to end corruption, political instability and monopolies in financing.Shah and Samdani (2015) explored the link between trade liberalization and FDI flows to D-8 countries comprising Nigeria, Bangladesh, Indonesia, Iran, Malaysia, Pakistan, Egypt and Turkey from 1991 to 2012. The study utilized panel data for the countries for the analysis and found that trade liberalization had a positive and significant effect on FDI flows to the D-8 countries during the study period. The study concluded that trade liberalization and other push factors are key predictors of FDI flows to developing countries.

III. Materials And Methods

3.1.1 Model Specification

This study used the quasi experimental research design. The paper adoptedtheAutoregressive Distributed Lag (ARDL) model anchored on the neoclassical theory of capital flows. Basically, the neoclassical theory of capital flows assumes that in an outward-oriented trade regime, capital flows from rich countries to poor countries due to the prevalence of high marginal productivity of capital in the latter. The model builds on the work of Shah and Samdani (2015) with modification due to the extension of the time frame and improvement on the variables under investigation as well as the use of country-specific time series data. The functional form of the model is formalized as:

FDI = F (LTO, EXD, TFF, RGDP)   1

As stated earlier, an Autoregressive Distributed Lag (ARDL) model of equation (1) is adopted to examine iflong-run relationship exists among the variables. The ARDL model is specified as:

$$\text{InFDI}_t = \lambda_0 + \phi_1 \text{InFDI}_{t-1} + \phi_2 \text{LTO}_{t-1} + \phi_3 \text{EXD}_{t-1} + \phi_4 \text{InRGDP}_{t-1} + \phi_5 \text{TFF}_{t-1} + \sum_{i=1}^{g} \beta_1 \Delta InFDI_{t-1} +$$

$$\sum_{i=1}^{h} \beta_2 \Delta LTO_{t-1} + \sum_{i=1}^{h} \beta_3 \Delta EXD_{t-1} + \sum_{i=1}^{h} \beta_4 \Delta InRGDP_{t-1} + \sum_{i=1}^{h} \beta_5 \Delta TFF_{t-1} + U_{1t} \qquad 1.1$$

Where: FDI = Foreign direct investment, LTO = level of trade openness, DEX = Dual exchange rate differential, RGDP = Real gross domestic product, proxy for economy size, TFF = Import tariff, In= Natural logarithm operator, Δ= First difference operator, λ_0 = term, ϕ_1 - ϕ_5= long run multipliers, $\beta_1 - \beta_2$ = coefficients of the lagged first-differenced regressors, λ_0 = term,g and h = lag lengths, U_{1t} = Random disturbance term

The error correction model (ECM) of ARDL model specified in equation (1.1) is utilized to reconcile the short-run dynamics with long-run equilibrium. The ECM of ARDL model is expressed below:

$$\Delta InFDI_t = \alpha_0 + \sum_{i=1}^{y} \alpha_1 \Delta InFDI_{t-1} + \sum_{i=1}^{y} \alpha_2 \Delta LTO_{t-1} + \sum_{i=1}^{y} \alpha_3 \Delta EXD_{t-1} + \sum_{i=1}^{y} \alpha_4 \Delta InRGDP_{t-1}$$

$$\sum_{i=1}^{y} \alpha_5 \Delta TFF_{t-1} + \Phi ECM_{t-1} + V_t \qquad 1.2$$

Where: FDI, LTO, EXD, RGDP, TFF, In and Δ are as described   in equation 1.1
α_0 = Constant parameter, $\alpha_1 - \alpha_4$ = short-run coefficients of the regressors, y = lag length

ECM = Error correction term lagged for one period, ɸ = Coefficient of ECM which measures the speed of adjustment, V_{1t}= Random disturbance term

3.2 Data and Variable Description
The data required for this study were adapted from World Bank World Development Indicators (WDI), United Nations Conference on Trade and Development (UNCTD) and Central Bank of Nigeria (CBN) Statistical Bulletin.The variables included in the model are described as follows:

a. Response variable
i. **Foreign direct investment (FDI):**Foreign direct investment is concerned with investments where a firm's shares and managerial functions are greatly under the control of the investor (Koekpe, 2015). The rationale for the choice of FDI as the measure of capital flows in this study stems from its attribute as the most stable form of capital flows in developing economies. The annual monetary value of FDI which measures net inflow from foreigners into Nigeria in physical plants and equipment with long-term considerations is utilized as the response variable.

b. Explanatory variables
i.   **Level of trade openness (LTO):** This involves the revealed openness measured by the ratio of the sum of export and import to gross domestic product (export +import/gross domestic product). Increased level of trade openness is expected to impact positively on capital flows. This is akin to Prasad et al (2003) assertion that trade integration increases capital flows to developing economies.
ii. **Exchange rate differential (EXD):** This entails difference between fixed official exchange rate and market-driven parallel exchange rate. It reveals the degree of control in the foreign exchange market and level of valuation of the domestic currency. Rummel (2010) opines that exchange rate is helpful in enabling countries take optimum advantage of increasing openness. The convergence of the fixed official and market-driven parallel exchange rates is expected to trigger inward foreign direct investment.
iii. **Economy size (RGDP):** This refers to the level of economic activity in an economy. It is captured by the real gross domestic product (RGDP), the actual value of final goods and services after adjustment by removing the effects of inflation. The inclusion of this variable stems from the gravity theory which assumes that economy size determine capital flows between countries. Thus, increase in the economy size is expected to attract capital flows.
iv. **Tariff (TFF):** This entails tax levied on imported commodities often measured in percentage. The graduation reduction in tariff as allowed under regime of trade liberalization is expected to enhance the attraction of foreign direct investment.

3.3 Estimation Techniques
The Autoregressive Distributed Lag (ARDL) model is utilized to examine the existence of long-term relationship among the variables. It is also considered helpful in ascertaining the long-term effects of each of the regressors on the dependent variable. The rationale for adopting Autoregressive Distributed Lag (ARDL) model developed by Pesaran and Shin (1999) and applied by Pesaran, Shin and Smith (2001), Shittu et al. (2012) and Belloumi (2014) and more stems from its application notwithstanding whether the variables are I(0), I(1) or a combination of I(0) and I(1). The ARDL model is very suitable and produces a robust result for small and relatively large sample size (Belloumi, 2014). The robustness of the ARDL tends to manifest when the observations are less than 30 (Nkoro and Uko, 2016). Thus, the suitability of the ARDL for small sample is noteworthy considering the sample size for this study. Again, Giles (2013) asserts that the ARDL model allows for easy application and interpretation as it involves a single equation set-up and provides room for assigning different lag to different variables in the model. Additionally, the expression of some of the variables, especially FDI and real GDP in natural log forms is to allow for their transformation from their highly skewed magnitude to more approximately normal forms and facilitate the interpretation of the results via elasticity.Additionally, the error correction mechanism (ECM) is employed to estimate the short-run dynamic coefficients of the regressors and the speed at which the model reconciles short-run dynamics with long-run equilibrium. Notably, the estimation of the ECM as posited by Engel and Granger (1987) depends on the evidence of long-run relationship among the variables. More importantly, pre-estimation and diagnostics tests are conducted. Discussions of each of these tests are provided as follows:
i. **Multicollinearity test:** This study employs multicollinearity test to check if any two of the explanatory variables are highly correlated. Gujarati (2004) posits that a correlation coefficient in the excess of 0.84 indicates evidence of severe multicollinearity. Specifically, a correlation matrix is utilized for this test as it provides insight into the extent of association between each of the variables under investigation.
ii. **Unit root test:** The time series characteristics of the variables in the model are ascertained via stationarity test. Specifically, it is applied to examine whether the mean, variance and autocovariance of each of the series

are time invariant. The Phillips and Perron (1988) method, an alternative procedure to the popular Augmented Dickey and Fuller (1981) approach is relied upon for the unit root test. The null hypothesis of a unit root is tested against the alternative hypothesis of no unit root. To validate the test results of the Phillips-Perron and avoid the problem of low power often associated with Phillips-Perronprocedure, the Kwiatkowski, Phillips, Schmidt and Shin, KPSS (1992) approach to stationarity test is employed as a complementary test procedure. The KPSS null hypothesis of stationarity is tested against the alternative hypothesis of non-stationarity. The model for the unit root test is formalized below:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=1}^{m} \beta_i \Delta Y_{t-i} + \lambda_t \qquad (2)$$

Where: Y_t = variables included in the model, α_1 and β_i = parameter estimates, m = lag length, Δ = First difference operato and λ_t = Random disturbance term

ii. Cointegration test

The bounds test approach to co-integration is applied to determine the existence of long term relationship among the variables. This is done by conducting a Wald test (F-test) for evidence of long run relationship among the variables. If the calculated F-statistic is greater than the upper bound critical value, the null hypothesis of no long run relationship will be rejected, but if it lies below the lower bound of the critical value, the null hypotheses cannot be rejected. The test will be described as inconclusive if the calculated F-statistic falls between the lower and upper bound critical values.

i.Serial correlation test: The Breusch-Godfrey (B-G) serial correlation LM test is relied upon to test for the existence of autocorrelation in the model. The choice of B-G serial correlation LM test stems from its efficiency and robustness in testing for autocorrelation beyond the first order and in the case of lagged endogenous variable.

iv. Misspecification test: The regression equation specification error test (RESET) credited to Ramsey (1960)is utilized to check whether the functional forms of the models are correctly specified. De Benedicts and Giles (1996) describes as it very useful for implicitly checking for evidence of functional misspecification in an estimated model.

v.Stability test: The cumulative sum (CUSUM) test of the recursive residual will be applied to examine the stability of the model over the sampled period. It is noteworthy that Brown, Durbin and Evans (1975) advocated for coefficients stability tests based on recursive residuals. However, Ploberger and Krämer (1990) extend the CUSUM test based on OLS residuals using a graphical approach. This allows for plotting the cumulative sum together in line with 5 percent critical lines.Residuals outside the area between the two critical lines show evidence of instability in the model

IV. Results And Discussions
4.1 Trend Analysis of the Series
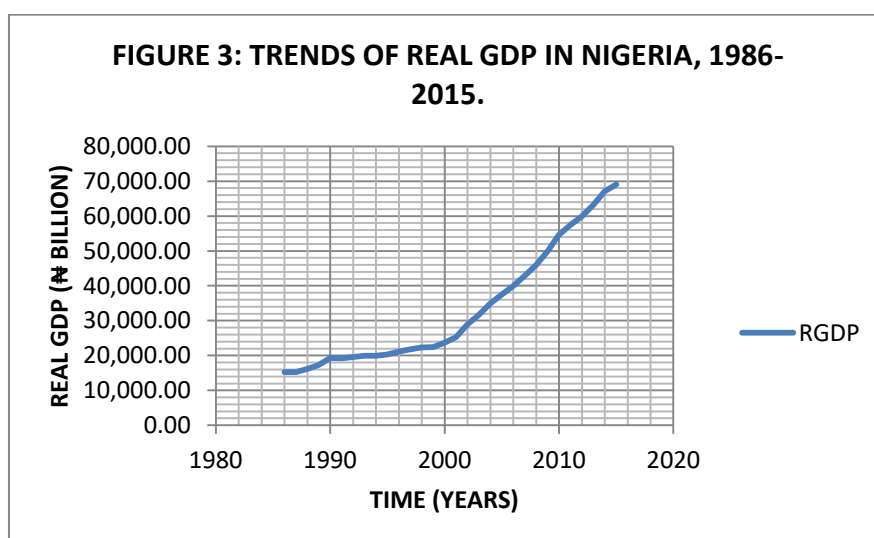

FIGURE 1: TRENDS OF FDI IN NIGERIA, 1986-2015.
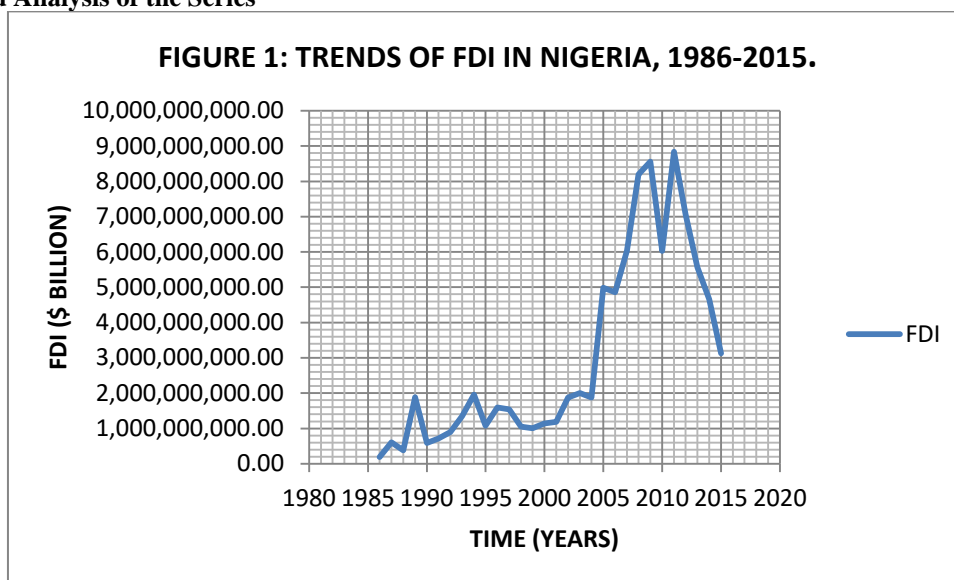
Source: Authors' estimation based on data adapted from World Development Indicators (2016) and complemented by data from United Nations Conference on Trade and Deveplopment (2015).

FIGURE 2: TRENDS OF LEVEL OF TRADE OPENNESS IN NIGERIA, 1986-2015
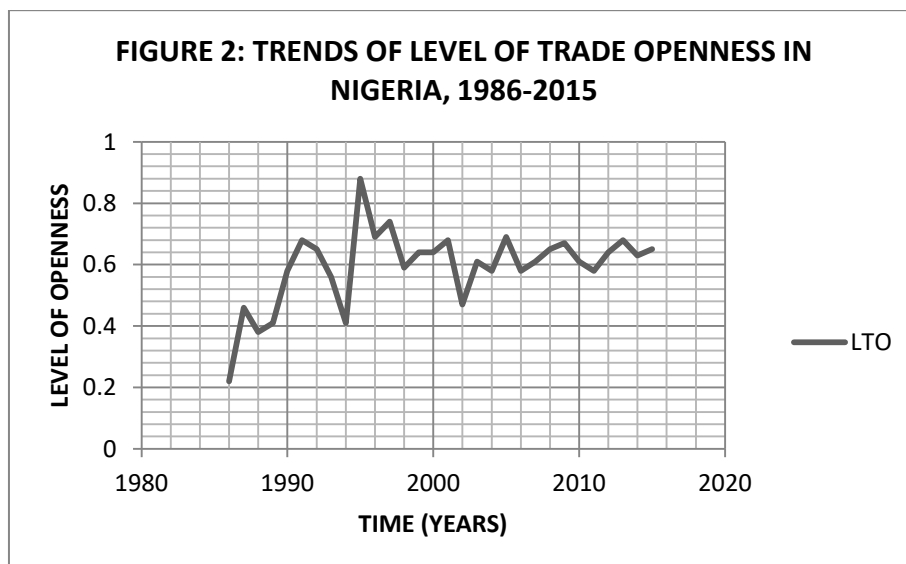
Source: Author's estimation based on data sourced from World Development Indicators (2016).

FIGURE 3: TRENDS OF REAL GDP IN NIGERIA, 1986-2015.

Source: Authors' estimation based on data obtained from Central Bank of Nigeria (2015) Statistical Bulletin.
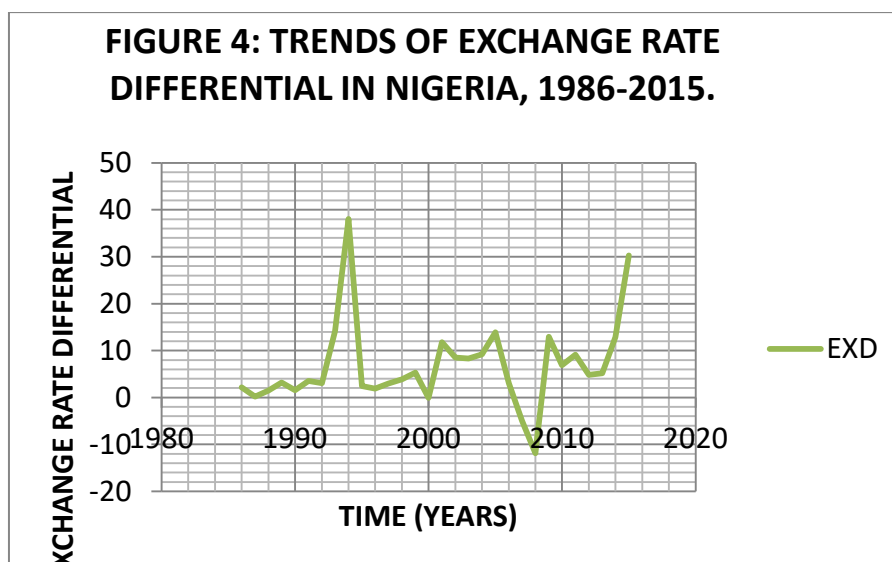
FIGURE 4: TRENDS OF EXCHANGE RATE DIFFERENTIAL IN NIGERIA, 1986-2015.

Source: Authors' estimation based on underlying data from Central Bank of Nigeria (2015) Statistical Bulletin.
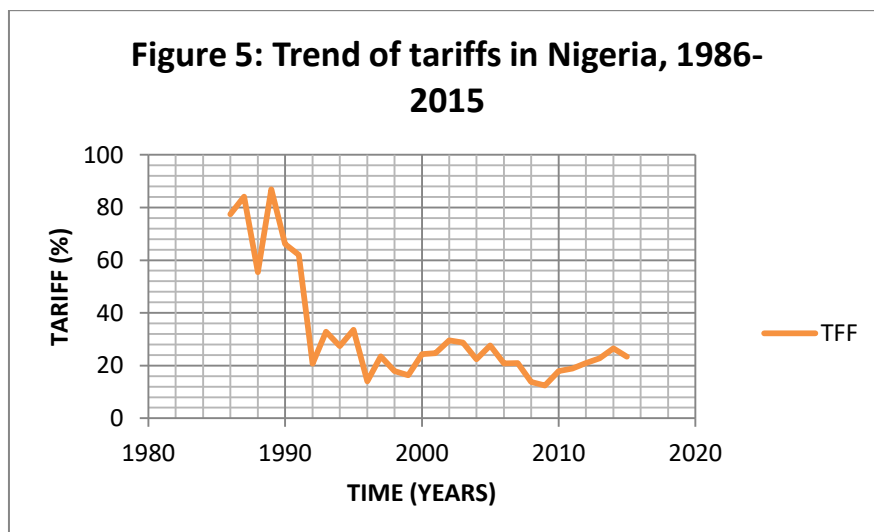
Source: Authors' estimation based on underlying data from Central Bank of Nigeria (2015) Statistical Bulletin.

Figures 1 to 5 shows the trends of foreign direct investment (FDI), level of trade openness (LTO) real GDP (RGDP), exchange rate differential (EXD) and tariffs (TFF) in Nigeria from 1986 to 2015. As depicted in figure 1 FDI fluctuated over the sampled, suggesting perhaps that its mean, variance and autocovariance are invariant over time. It reached a record high of 8,841,113,287 billion dollars in 2011. Similarly, level of openness tends to be mean reversal during the period under consideration. This gives intuitive information into its time series properties which are examined using the unit root tests. Evidence in Figure 3 indicates that real GDP is upward trending, indicating that its mean values increases over time. It reached a maximum value of 69,023.93 billion naira in 2015. As illustrated in figure 4, EXD measured by the difference between parallel flexible and fixed official exchange rates fluctuated during the sampled period. It attained an all-time high in 1994, but declined to a record low in 2008. This is a pointer that the Nigerian foreign exchange market witnessed some level of control despite the deregulation of the market that is associated with the trade liberalization policy introduced in 1986. The trend of tariff depicted in figure 5 reveals that it fluctuated between 1986 and 2015, attaining a maximum of 86.93 percent in 1989 and a minimum of 12.4 in percent 2009.

4.2. Basic Descriptive Statistics

The basic descriptive statistics involving mean, standard deviation, range, skewness and Jacque-Bera statistics amongst others were employed to identify the distribution of the economic variables based on their average values, convergence or divergent from their respective mean values, their respective minimum and maximum values as well as normal distribution. The results of the descriptive statistics for each of the series are summarized below in table 1.

Table 1: Summary of basic descriptive statistics for FDI, RGDP, LTO, EXD, and TFF

	FDI	LTO	RGDP	EXD	TFF
Mean	3.03E+09	0.595333	33416.67	6.793667	32.46867
Median	1.87E+09	0.620000	24477.91	4.360000	23.90500
Maximum	8.84E+09	0.880000	69023.93	38.07000	86.93000
Minimum	1.93E+08	0.220000	15237.99	-11.89000	12.40000
Std. Dev.	2.69E+09	0.125389	17281.67	9.346018	21.40663
Skewness	0.917966	-0.876357	0.784741	1.516563	1.506470
Kurtosis	2.453441	4.665553	2.200290	6.635619	3.915815
Jarque-Bera	4.586713	7.307594	3.878510	28.02197	12.39566
Probability	0.100927	0.025893	0.143811	0.000001	0.002034
Observations	30	30	30	30	30

Source: Authors' estimation from E-views 9

The basic descriptive statistics reported in table 1 above reveals that foreign direct investment (FDI) averaged 3,030,000,000 billion dollars while real GDP (RGD), level of openness (LTO), exchange rate differential and tariff (TFF) averaged 0.595333, 33416.67, 6.793667 and 32.46867 respectively between 1986

and 2015. As indicated in the minimum and maximum values of each of the series FDI ranged from 193,214,907.50 to 8,841, 113,287 while RGDP ranged from 15237.99 to 69023.93, LTD ranged from 0.220 to 0.880, EXD ranged from -11.890 to 38.070 and TFF ranged from 12.40 to 86.93. Evidence from the standard deviation indicates that FDI, LTO, RGDP and TFF converged around their respective mean values while EXD is divergent from its mean value. Additionally, it was observed from the skewness that all the variables except level of openness (LTO) are positively skewed (tailed to the right). It was equally found that aside real GDP, the other variables are associated with thick tails. Moreover, it was uncovered that the errors in FDI and RGDP are normally distributed at 5 percent level given that the probability values of their Jacque-Bera statistics exceed 0.05. It therefore follows that the null hypothesis of normal distribution cannot be rejected for FDI and RGDP while it is rejected for the other variables under investigation.

4.3 Multicolinearity Test

This study relied on correlation matrix as it provides insight into the extent of association between each of the variables under investigation. Basically, it is helpful in identifying the problem of multicolineraity given its harmful effect in the estimated model as outlined by Gujarati (2004) and Vanghan and Berry (2005). The correlation matrix is presented in table 2 as follows.

Table 2: Correlation matrix of the series

	FDI	LTO	RGDP	EXD	TFF
FDI	1				
LTO	0.2435	1			
RGDP	0.8039	0.2975	1		
EXD	-0.0267	-0.0939	0.2119	1	
TFF	-0.4941	-0.5853	-0.5058	-0.1646	1

Source: Authors' estimation from E-views 9

The correlation coefficient between each of the explanatory variables is below 0.84 which is considered by Gurati (2004) as evidence of severe multicolinearity. Thus, it can be concluded that the variables are free from multicollineary and can be estimated without instability in the coefficients.

4.4 Unit Root Test

The unit root test employed by this study to examine if the mean, variance and autocovaraince of each of the series are time invariant relied on the Phillips and Perron (1988) method, an alternative procedure to the popular Augmented Dickey and Fuller (1981) approach. The null hypothesis of a unit root is tested against the alternative hypothesis of no unit root. To validate the test results of the Phillips-Perron and get rid of the problem of a possible low power, this study adopted the Kwiatkowski, Phillips, Schmidt and Shin, KPSS (1992) approach as a complementary stationarity test to Phillip-Perron unit root test procedure. The KPSS null hypothesis of stationarity is tested against the alternative hypothesis of non-stationarity. The results of the Philips-Perron and KPSS unit root test are summarized in table 3 and 3.1 respectively.

Table 3: Summary of Philips-Perron Unit root test results

Variable	Philips-Perron test statistics				
	Levels	Bandwidth	1st difference	Bandwith	Order of intersection
I_nFDI	-3.668 (0.0411)	3	-9.455 (0.0000)	2	I (0)
LTO	-5.573 (0.0005)	14	-15.392 (0.0000)	12	I (0)
InRGDP	-1.468 (0.8173)	2	-3.264 (0.0266)	1	I (1)
EXD	-3.134 (0.1175)	6	-11.619 (0.0000)	27	I (1)
TFF	**-2.333 (0.402)**	**7**	**-22.771 (0.0000)**	**27**	I (1)

Source: Authors' computation from E-views 9
Note: Figures in parenthesis represent the corresponding Mackinrom (1996) one sided p-values. I(0) and I(1) respectively denote integrated of order zero and order 1.

Table 3.1: Summary of KPSS stationarity test results

Variable	KPSS test statistics				
	Levels	Bandwidth	1st difference	Bandwidth	Order of integration
I_nFDI	0.071 (0.146)	3	0.097	1	I (0)
LTO	0.384 (0.463)	2	0.315 (0.463)	13	I (0)
InRGDP	0.162 (0.146)	4	0.103 (0.146)	2	I (1)
EXD	0.08 (0.146)	4	0.500 (0.146)	28	I (0)
TFF	0.476 (0.463)	4	0.396 (0.463)	22	I (1)

Source: Author's computation from E-views 9
Note: Figures in parenthesis are the asymptotic critical values at 5 percent level.

Tables 3 and 3.1 present the Philips-Perron and KPSS unit root tests results respectively. The Newey and West (1994) bandwidth selection approach was applied to automatically decide the bandwidth for each of the series at various levels of test. The test results of Philips-Perron approach reveal that FDI and level of trade openness (LTO) are stationary at levels while real GDP (RGDP), exchange rate differential (EXD) and tariff (TFF) are stationary at first difference. It follows that FDI and LTO are integrated of order zero while the other variables (RGDP, EXD and TFF) are integrated of order one.

Additionally, the complementary test of KPSS for evidence of stationary indicates that FDI, LTO and EXD are stationary at levels while RGDP and TFF are stationary at first difference. The above results indicate that the variables are fractionally integrated with a combination of I(0) and I(1). Having established that none of the series is I(2), the condition for applying for test bounds test approach to cointegration of the ARDL method as proposed by Pesaran and Shin (1999) is fulfilled.

4.5 ARDL Bounds Test for Cointegration
The cointegration test with focus on ARDL bounds testing method was utilized by this study to examine if the variables have long run relationship. The F-statistic test (Wald test) is applied to test the null hypothesis of no long run relationship against the alternative hypothesis of long run relationship and the result is summarized in table 4 below.

Table 4: Summary of the result of ARDL based bounds test approach to cointegration

Test statistic	Value	K
F- statistic	5.823	**4**
Bounds critical values		
Significance level	**Lower bounds [I(0)]**	**Upper bounds [I(1)]**
1 percent	3.74	5.06
2.5 percent	3.25	4.49
5 percent	2.86	4.01
10 percent	2.45	3.52

Source: Authors' computation from E-views 9
Note: k denotes number of regressors

Table 4 shows the bounds test result for evidence of long run relationship among the variables. The Wald test of coefficients in the ARDL model was employed to compute the F-statistic. It was uncovered that the computed F-statistics (5.823) is higher than the upper bounds critical value (4.01) at five percent level, indicating that long run relationship exists among the variables. Thus, the null hypothesis that no long run relationship exists is rejected at 5 percent level. Having established that the variables have long run relationship, the ARDL estimates and long run coefficients are estimated.

4.6 Estimation of ARDL model and Long run Coefficients
The ARDL (1, 2, 3, 0, 3) model is automatically decided based on Akaike information criterion (AIC) and the estimates as well as long coefficients of the regressors are reported in Table 5.

Table 5: Estimated long run coefficients of the regressors Dependent variable: $InFDI_t$

Regressor	Coefficient	T-statistic	P-value
I_nRGDP_t	1.042 ***	3.494	0.0040
LTO_t	-15.944 ***	-3.031	0.0096

EXD$_t$	-0.0239 **	-2.456	0.0287
TFF$_t$	-0.073 ***	-3.332	0.0054
Const	22.861 ***	3.621	0.0031
R-squared = 0.959, Prob. (F-stat) = 0.0000			

Source: Authors' computation from E-views 9
Note: * and ** respectively indicate significant at 1 percent and 5 percent levels.**

The ARDL model depicting the process (1, 2, 3, 0, 3) and estimated long run coefficients of the regressors are reported in Table 5. It was uncovered from the result that the level of trade openness does not appear with the hypothesized positive sign as it is found to generate a significant negative effect on FDI. This is suggestive that the Nigeria's economic environment tends not to justify the neoclassical assumption that openness to trade encourages flow of capital from capital-rich economies to capital-poor economies. Real GDP on the other hand has a very high significant positive impact on FDI. This finding demonstrated that 1 percent increase in real GDP leads to 1.04 percent increase in FDI, implying that real GDP is very important in mobilizing FDI to Nigeria as it gives good signal to foreign investors about the Nigerian market size. Contrarily, the long term effects of exchange rate differential and tariff on FDI is negative. The coefficients of these regressors are equally found to be significant at 5 percent level. These findings are consistent with the hypothesized signs and statistical criteria. The significant negative effect of exchange rate differential on GDP is a pointer that the existence of both fixed official and parallel market exchange rates in the Nigerian economy tends to contract Nigeria's competitiveness in the global economic environment with regard to promotion flows of FDI. The robustness of the estimated ARDL model is equally demonstrated by its very high coefficient of determination, given that approximately 96 percent variations in FDI are jointly explained by changes in real GDP, level of trade openness, exchange rate differentials and tariff. This is very satisfactory as it is far above the benchmark of 50 percent. More so, the probability value of the f-statistics is very insightful as it indicates that taken together, the regressors are significant in influencing FDI in Nigeria.

4.7 Error Correction Representation of the ARDL Model
The error correction representation of the ARDL process (1, 2, 3, 0, 3) is employed to partly demonstrate the short run behavior of the lagged endogenous and explanatory variables as well as capture the speed of adjustment. The estimated parsimonious ARDL–ECM for FDI is summarized below in Table 6.

Table 6: summary of parsimonious ARDL –ECM result Dependent variable: ΔInFDIt

Variable	Coefficient	T-statistics	p-value
$\Delta I_n FDI_{t-1}$	0.579 **	2.596	0.0256
$\Delta I_n FDI_{t-2}$	0.143	0.765	0.4614
$\Delta I_n RGDP_t$	-4.777	-1.765	0.1159
$\Delta I_n RGDP_{t-1}$	7.785 **	2.356	0.0402
$\Delta I_n RGDP_{t-2}$	-4.524	-1.685	0.1228
ΔLTO_t	-3.317 ***	-4.241	0.017
ΔLTO_{t-1}	-1.894 ***	-2.509	0.00309
ΔLTO_{t-2}	-2.275 **	-2.531	0.0298
ΔLTO_{t-3}	-3.069 ***	-4.328	0.0015
ΔEXD_t	-0.0144	-2.106	0.0614
ΔEXD_{t-2}	0.004	0.660	0.5241
ΔTFF	-0.0204	-1.932	0.0821
ΔTFF_{t-1}	-0.303 ***	-4.142	0.0020
ΔTFF_{t-3}	0.0136	1.8261	0.0978
ECM (-1)	-1.480 ***	-3.563	0.0052
Const	0.1099	0.751	0.4695
R=Squared = 0.851, Prob. (F-Stat) = 0.0189			

Source: Authors' estimation from E-views 9
Note: ** and * respectively represent significant at 1 percent and 5 percent levels.**

The short run behaviour of the regressors in the parsimonious ARDL–ECM reported in table 6 are consistent with their long run behaviour showed in table 5. The first lag of FDI has significant positive effect on current level of FDI. The first lag of real GDP on the other hand exerts significant positive effects on FDI in the short run. Like their long term effects on FDI, the short run behaviours of level trade openness, exchange rate differentials and tariff indicate that they contract FDI flows to Nigerian economy. This is very insightful as it shows the effectiveness of trade liberalization and its associated policy reforms in mobilizing capital flows to Nigeria. The ECM coefficient is consistent with the hypothesized negative sign and it is highly significant at 1 percent level. With a coefficient of -1.480, the ECM suggests that the convergence is instantaneous with 100 percent of deviations from the previous period's shock being adjusted to long run equilibrium in the current period. The R-squared and adjusted R-squared respectively reveal that 85 percent variations in FDI are

explained by all the regressors while the regressors that actually influenced FDI during the period of analysis explained approximately 63 percent in its total variation. Thus, the model is considered as a good fit given that the adjusted R-squared exceeds the criterion of 50 percent. Again, the overall model is considered as significant given that the probability value of F-statistic falls below 0.05 significance levels. These findings validates the assertions of Nkoro and Uko (2016) that the relative efficiency of the error correction representation of the ARDL tends to manifest in the evidence of long run relationship among the series from the Wald test.

4.8 Diagnostic Tests
The results of these diagnostics are summarized in respectively in Table 7.

Table 7: Diagnostic test results

a. Test results for the ARDL model

Test type	Test stat.	p-value
Breush-Godfrey LM test	X^2-statistics	0.5763
White's heterskedasticity test	X^2-statistics	0.5954
Normality test	Jacque-Bera stat.	0.8250
Ramsey RESET test	F-statistics	0.4146
b. Test results for the parsimonious ARDL – ECM		
Test type	Test stat.	p-value
Breush-Godfrey serial correlation LM test	X^2 statistics	0.2163
White's heterskedasticity test	X^2 statistics	0.4682
Normality test	Jacque-Bera stat.	0.7693
Ramsey RESET test	F-statistics	0.0748

Source: Authors' estimation from E-views 9

Table 7 shows the summarized results of the diagnostic test for both models. It was uncovered from the serial correlation LM test result that both models are not serially correlated at 5 percent level given that the p-value of the chi-square distributed statistics are more than 0.05. Thus, this study fails to reject the null hypothesis of no serial correlation for both models. Similarly, the White's heteroskedasticity test reveals that the variance of error term is constant in both models, indicating that the null hypothesis that the variance of the random variable is homoscedastic cannot be rejected at 5 percent level. Additionally, the probability value of Jarque-Bera statistics shows that the errors are normally distributed. Evidence from the Ramsey-RESET test reveals that the computed p-value is greater than 0.05, indicating that the functional forms of both model are specified correctly. The results of the diagnostics tests discussed above are very welcoming as they authenticate the efficacy and reliability of the models for forecasting and long term policy implementation.

4.9 Stability Test
The stability test was employed to graphically investigate the stability of the estimated coefficient of the error correction model as proposed by Pesaran and Shin (1999). This is depicted in figure 6 below

Figure 6: plot of the cumulative sum (CUSUM) of the recursive residual.
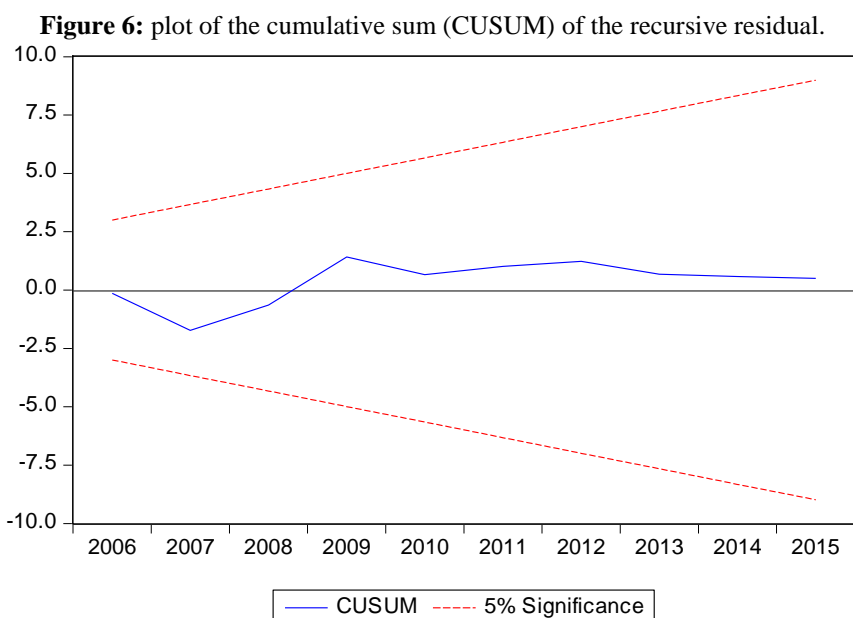
Source: Authors' estimation from E-views 9

The stability test illustrated in Figure 6 above indicates that the estimated coefficients are stable over the years under consideration as the CUSUM plot lies within the 5 percent critical lines. Thus, the stability of the estimated coefficients is established over time.

V. Discussion of Findings and Policy Implications

The findings from the empirical analysis of the datasets are discussed with focus on the long and short term effects of the regressors on FDI over the years under consideration, 1986 – 2015. Again, the policy implications of these findings and their link to earlier related studies are equally provided.

a. Level of trade openness and FDI in Nigeria

The empirical result reported in table 5 indicates that the long term effect of level of trade openness on FDI in Nigeria is negative. Although consistent with the Lukas (1990) finding in India, this finding is in contrasts to the findings of Shah and Samdani (2015) that trade liberalization attracted FDI to D-8 economies comprising Nigeria, Bangladesh, Indonesia, Malaysia, Pakistan, Egypt and Turkey over the period, 1992–2012. Again, it corroborates to the findings of Klan, Adnan and Hyee (2014) that trade openness as an indication of liberalizations contracted FDI inflows to Pakistan. The explanations for the negative effect of trade openness on FDI in Nigeria are based on the structural rigidities, poor macroeconomic fundamentals and weak institutions prevalent in the Nigerian economy. Thus, high economic uncertainties and sub-optimal outcomes often characterized trade liberalization policy when these prerequisites are not put in place.

b. Real GDP and FDI in Nigeria

It was uncovered from the estimated ARDL model that real GDP is an important driver of FDI in Nigeria. A percentage increase in real GDP is found to enhance FDI by 1.04 percent. This finding coincides with the theoretical underpinnings and statistical requirements. Again, it is very insightful as it indicates that the Nigerian market size gives an impressive signal to foreign investors. This supports the gravity theory assumption that the size of the economy is a key driver of FDI to the recipient economy.

c. Exchange rate differential and FDI in Nigeria

The long term effect of exchange rate differential on FDI is negative. This is suggestive that the prevalence of fixed official and parallel exchange rate systems in Nigeria adds to economic uncertainties envisage by foreign investors in making their investment decision in Nigeria. The implication of this finding is that the foreign exchange market has not experienced the required deregulations in accordance with international best practices. Thus, this does not provide the Nigerian economy the required competitiveness by making it an attracting environment for FDI.

d. Tariff and FDI in Nigeria

As showed in table 5, tariff has a significant negative effect on FDI in the long run. This is indicative that efforts geared towards attracting FDI in Nigeria through reduction in tariffs tend not to generate intended and desired effects. It follows that the gradual removal of barriers to trade through tariff reduction fails to create the intended benefits in form increased FDI inflows as identified by (Ude and Agodi, 2015) and at the same contracts the fiscal ability of the government in meeting increasing responsibilities of welfare maximization.

VI. Concluding Remarks and Policy Recommendations

The focal point of this paper is the empirical analysis of the long term effect of trade liberalization on capital flows to Nigeria using ARDL model. Again, the re-parameterization of the ARDL model into parsimonious ARDL-ECM is equally demonstrated to provide insight into the short run behavior of the regressors. It was uncovered that the short run and long run impact of level of openness on inward FDI is negative. This is synonymous with the effects of tariffs and exchange rate differential on FDI. Contrarily, it was discovered that real GDP is an important predictor of FDI in both short run and long run. Owing to the above findings, this paper concludes that the generalization of the neoclassical assumption that in a liberalized trade regime; capital flows from rich to poor economies is misleading. Another conclusion drawn from the findings is that the large size of the Nigerian economy sends good signal to foreign investors which helps the economy to advance on the on the ladder of FDI. Thus, this paper is considered to have offered plausible insights into the issues surrounding trade liberalization and its effectiveness in attracting FDI to Nigerian economy. To make Nigeria an attractive environment for capital flows owing to the empirical findings of this paper, the following policy actions are proffered:

1. Government should ensure that the framework for prudential implementation of trade liberalization policy is associated with the establishment of requisite macroeconomic fundamentals and strong institutions required to make Nigerian a conducive environment for capital inflows.

2. Government and other stakeholders in the Nigerian economy should strive to increase the Nigerian's market size by keeping the economy on the path of growth in order to make the country an attractive area for FDI.
3. Monetary authorities should ensure that constraints to foreign exchange market flexibility are removed in order to increase the competeveness of the Nigerian economy with regard to attracting capital flows.
4. The fiscal stimulus, especially tariffs reductions which are often associated with trade liberalization should be adequately communicated to foreign investors in order to increase its effectiveness in mobilizing FDIs and optimize their impacts on the Nigerian economy.

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