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CROSS-BORDER INVESTMENT: A CRITICAL FACTOR FOR THE ECONOMIC GROWTH OF NIGERIA

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Abstract
This study sized-up the impact of cross-border investment on economic growth of Nigeria for the period ranged from 1982 to 2022. To realize robust results, unit root tests were conducted with the aid of the Augmented Dickey-Fuller unit root test and Zivot-Zandrews structural adjusted unit root test. The result outcomes of the unit root tests, led the study into engaging the Autoregressive Distributed Lag (ARDL) model and the Kernel-Based Regularized Least Squares (KRLS) model to estimate the variables of the study. The variables used in the research were gross domestic product as the explained variable, whereas foreign direct investment inflows, foreign direct investment outflows, GDP per capita, exchange and inflation rate were employed as the explanatory variables. The results reported that foreign direct investment inflows and foreign direct investment outflows had no significant average marginal influence on gross domestic product in Nigeria. The results also indicated that GDP per capita and exchange rate had significant and positive average marginal impact on economic growth; while inflation rate had no significant but increasing average marginal influence on gross domestic product in the economy. On the above note, the study recommended that government should take inward looking economic policies aimed at attracting foreign direct investments in Nigeria. This can be done by granting tax waivers or reducing taxes on capital inflows or even on foreign companies operating in the country. More so, insecurity challenges should be severely dealt with to secure foreign capital inflows and protect outflows of foreign direct investment from cyber-crimes. It is in this view that foreign direct investment can on average affect economic growth of Nigeria significantly and positively.
Keywords: Cross-border investment, Inflows, Outflows, Factor, Economic growth

1. Introduction

The main factor of economic globalization or integration in the world economy is foreign direct investment. Foreign direct investment complements domestic resources in the economic growth and development processes (Matzner, 1996). At a time of resource deficiency in financing long-term development, nations relied on foreign capital, especially on foreign direct investment to bridge the resource-gap and achieve rapid economic growth. According to Kose (2018), foreign direct investment is described as an investment made by an individual or a company or an investor in a country other than the investor's own country, for which business is established or acquiring business assets in the foreign nation.

Capital account liberalization, also known as the trade openness is the channel through restrictions to cross-border capital flows are eased (Kose, 2018). Trade openness plays a crucial role in promoting foreign direct investment and economic growth in any country (Grossman, 1990; Romer, 1990; Young, 1991). With the rise of globalization, the integration of national economies through international trade, and capital transfers has boosted global economic growth. One important clarification in this research borders on the fact that foreign direct investment (FDI) including its inflows, outflows and export-advancing activities are essential

in deepening nation's economic development level. It serves as a vehicle for innovation transfer, increase in domestic investments and human capital development. In the opinion of Matzner (1996), foreign direct investment aids economic control transfers and wealth to foreign economies ultimately resulting in economic marginalization of the FDI host countries. Contrarily, the neo-liberal scholars argue that foreign direct investment provides vast benefits to host countries of third country nations (TCNs) (Noko 2016). They are of the belief that FDI brings crucial western knowledge and value in the form of superior western management qualities, business ethics, entrepreneurial attitude, better labour-capital ratio, and production techniques (Ayanwale, 2004).

The important of FDI on the host economy hinges on the fact that it facilitates the exploitation and use of local raw materials, transfer of modern techniques of management and marketing, creating easy access to new technologies, creation of employment opportunities, and improved exchange rate conditions among others. Increase in human capital stock often result in a rise in the domestic production, thereby matching the flow of foreign direct investment. However, poor domestic output lures an economy in depending heavily on foreign direct investment, which could expose the economy to the problem of deficit balance of payments (Olokoyo, 2012). Many developing countries and continents see attracting FDI as an important element in their strategy for economic growth and development. Hence, there is a general consensus among economists of the positive relationship between FDI and economic growth as it can bring about new capital, technology, and expertise that can spur innovation and productivity that will foster economic growth.

Emphatically, most nations of the world, Nigeria inclusive strive to attract foreign direct investment (FDI) due to its acknowledged advantages as a tool for economic development (Egwaikhide, 2012). Specifically, Nigeria and other African countries seek foreign direct investment because of its role in economic expansion, creating employment opportunities, poverty reduction and increase per capita income. This is evidenced by the formation of the New Partnership for Africa's Development (NEPAD), which has the attraction of foreign investment to Africa as a major objective. Due to its market size and resource endowment, Nigeria has been mostly favoured and one of the destinations of foreign investment, as it accounts for a large proportion of foreign direct investment inflows in Africa (Olokoyo, 2012).

However, Trading Economics (2015) observed that the level of foreign direct investment attracted by Nigeria volatile over the years. Statistical report from the CBN (2022) and UNCTAD (2009, 2014) showed that the Nigeria foreign direct investment inflows stood at 1.64 percent in 2000, and rose to 2.84 percent in 2005. It, however, declined to 1.64 percent in 2010. It further fell to 0.62 percent in 2015. From 0.62 percent in 2015, it fell again to 0.55 percent in 2020. Similarly, the performance of FDI outflows was as well volatile over the period which has a negative impact on growth, knowing well that FDI outflows act as a capital flight in the economy.

Nigeria has abundance of resources but she is rated as one of the poorest economies of the world. This is blamed on persistent decrease in FDI inflows, caused by political instability, lack of skilled labour, lack of follow up on FDI policies and trade openness restrictions that impedes FDI inflows in the economy. However, Nigeria adopted such policy as the openness of the economy so as to promote foreign direct investment but unfortunately, the growth experience of Nigeria in the attraction of foreign direct investment has not been very satisfactory as they are faced with many challenges and continued to wallow in abject poverty. Given the flow of foreign direct investment in Nigeria over time and the prevailing economic situations in the economy, the study examined the impact of foreign direct investment components on economic growth of Nigeria.

2. Theoretical Framework

There are several economic theories of growth explaining the nexus between capital flows and economic growth in development process of nations. However, the major ones considered in this study include the Mundell-Fleming model, endogenous growth theory, classical theory of foreign direct investment, and dependency theory.

2.1 Mundell-Fleming model

The Mundell-Fleming model was first developed by Mundell in the early 1960s and popularized by Fleming in 1962. The Mundell-Fleming model can also be referred as the IS-LM-BOP model. The Mundell-Fleming model development followed the improvement of the IS-LM model to incorporate open economy in which the product and capital markets were internationally brought together and thus, providing knowledge on how exchange rate is ascertained (Danladi et al., 2015). While the Mundell-Fleming model is an improvement of the IS-LM model, the IS-LM model basically focused on a closed economy.

The Mundell-Fleming model is an integration of the close and open economies. The major difference between the IS-LM and the Mundell-Fleming models is that the Mundell-Fleming model involves an economic model which integrates foreign trade into the macroeconomic model (IS-LM model). The model is closely related to IS-LM model. The two models assumed that price level is fixed and then indicates what leads to short-run fluctuations in aggregate output or income as well as shifts in the aggregate demand curve. The Mundell – Fleming model postulated the nexus between the nominal exchange rate and output in an economy in the short run. According to Danladi et al, (2015), interest rate is a critical component in the determination of both the good and the money markets' equilibrium. Considering the Mundell – Fleming framework in a close economy, the rate of interest is fixed and equilibrium in the both markets could be achieved by a change in nominal exchange rate.

In the Mundell-Fleming model, the system of exchange rate introduced is crucial as it can have several implications under different regimes of exchange rate. For instance, under a flexible regime of exchange rate, the model indicates that fiscal policy is significantly ineffective in affecting output, whereas monetary policy is very much effective. However, if fixed exchange rate is adopted in the economy, the monetary policy would become ineffective in stimulating output of the nation while the fiscal policy significantly becomes effective in the output and exports growth of the economy (Danladi et al., 2015). This Model in addition to the Solow-Swan model will form the theoretical framework for this study.

2.2 Endogenous Growth Theory

Endogenous growth theory is a theory which explains the long-run growth rate of an economy on the bases of endogenous factors as against the exogenous factors of the neoclassical growth theory. The theory was developed by Romer (1990). The theory emphasizes technical progress resulting from the rate of investment, the size of the capital stock and the human capital. The assumptions of the theory are; there are many firms in a market, knowledge or technical advances is a non-rival good, there is increasing returns to all factors taken together and constant returns to a single factor, at least for one, technological advance is based on the creation of new ideas, individuals and firms have market power and earn profits from their discoveries. This assumption arises from increasing returns to scale in the production that leads to completion. The model is in the form

$$Y_i = A(K)F(K_iL_i) \qquad 1$$

Where Y_i denotes output of firm i, K_i denotes firm capital stock, L_i denotes its labour stock, K denotes the aggregated stock of capital and A is the technology factor. For output of an economy to grow, it involves that the capital stock, skilled labour and technological

advancement must be highly encouraged. In Nigeria increase in infrastructural development, educational investment to produce skilled is highly needed, while policies conducive for investors attracts foreign investment with the needed technology will lead to the increase in gross domestic product and generate employment opportunities for teeming Nigerians.

2.3 Classical Theory of Foreign Direct Investment

According to the classical economic theory, FDI is wholly beneficial to the host economy. In other words, it is the host economy where investment i=s made that benefits the most from FDI as a result of the capital inflows that is made available to the host economy by the investors. The transfer of technical knowledge and skills which are not available in the host economy, creation of employment opportunities to solve the problem of unemployment in the host economy as the greater the flow of foreign direct investment, the more beneficial it is to the host economy(World Bank, 1992). Nevertheless, strong criticism has been directed against the theory. It is argued that the flow of resources to a host country does not bring about the development of the economy as it only benefits the elites and brings about an unequal development within a nation because the elites benefits while a large group is exploited in the economy by the investors.

2.4 Empirical Review

A work carried out by Ayano (2023) investigated the impact of foreign direct investment (FDI) on economic growth in Nigeria from 1980 to 2020, using multiple regression techniques and result shows a long run relationship among the variables, there exists a negative and significant nexus between foreign direct investment inflow and real gross domestic product, a negative but not significant relationship between inflation rates and real gross domestic product, a positive but not significant relationship between real effective exchange rate and real gross domestic product, a positive and significant relationship between lending interest rate and real gross domestic product, and finally, a negative and insignificant relationship between gross capital formation and real gross domestic product.

Oghenefejiro (2023) also examined the impact of FDI on economic growth in Nigeria with the period of 1980-2022 using descriptive statistics. The results indicated that FDI inflow had a positive and significant impact on economic growth in the economy. Similarly, Mwitta (2022) evaluated the impact of FDI on economic growth in Tanzania from 1990-2020. It was found that FDI inflow had a positive and significant impact on gross domestic product in the economy. Nguyen (2022) examines the impact of FDI on economic growth in Vietnam within the period of 1990-2020, and the study discovered that FDI inflow has a Negative but significant impact in the short run and positive and significant impact in the long run. Oyebanji et al. (2022) examines the effects of FDI on structural development proxied by economic growth in Nigeria within the period of 1996-2020. The finding revealed that FDI inflows is positive and has a significant impact on economic growth (GDP) while other variables used in the model such as exchange rate and inflation rate are negative but has a significant impact on economic growth in Nigeria.

Liang et al. (2021) examined the role of fdi inflow in economic growth: evidence from developing countries from 2000-2019 using hausman fixed effect and instrumental variables two stage least square region. It was discovered that there exist appositive relationship between fdi inflow and economic growth and it was significant while unemployment and economic growth is found to be negative. Oyegoke (2021) investigated the effects of FDI inflow and FDI outflow on economic growth with evidence from Nigeria for the period 1970-20. The OLS single regression result shows FDI inflow has a positive impact on the economy. On the other hand, FDI outflow has a negative effect on economic growth, though not significant. Chaudhury et al. (2020) examined the impact of FDI on economic growth in south Asia to see

if the nature of FDI matters from the period of 1990-2014 to ascertain the impact of FDI on economic growth which was analyzed in a panel data framework using econometric software STATA which revealed that overall FDI inflow has a positive impact on economic growth. Joshua et al. (2020) investigated the impact of FDI inflows on economic expansion for a selection of 200 economies around the world for the period of 1990-2018 using pooled ordinary least square (POLS) and generalized method of moments (GMM). The study found that FDI, debt stock have insignificant positive impact on GDP while trade openness and exchange rate had a mixed impact (negative and positive) on GDP. Adekanmbi et al. (2020) examined the effect of foreign direct investment on economic development in Nigeria from the period of 1986-2018 using OLS discovered that fdi inflow has a positive and significant effect on economic development of Nigeria while exchange rate has not significantly affected Nigerian economic development.

Joshua (2020) also examined the influence of external factors on economic expansion in South Africa and confirmed that FDI inflows promote economic expansion. The study recommends the need for authorities to adopt policies that promote business environment (both political and economic) through stable exchange rates and other macroeconomic variables to boost the confidence of existing foreign firms and to woo new ones. In contrast, Joshua et al. (2020), through the causality method found that FDI inflows do not drive economic growth in Nigeria. Ahmed (2019) studied the impact of FDI inflows and outflows on economic growth of developed and developing countries such as USA, UK and France and developing countries such as Turkey, Malaysia and Iran from 1980-2017 using ARDL where it was discovered that FDI inflows and outflows for developed countries (USA and UK) have a positive impact on GP while France has a negative impact on GDP and FDI inflows and outflows of all developing countries looked at in the study have positive impact on economic growth.

Oziengbe (2019) examined the effect of financial openness on FDI inflows in Nigeria using data that span the period from 1981 to 2016.The FMOLS estimator is employed. The study finds that financial openness is negatively and significantly related to FDI inflows, but its interaction with political regime is positive and significant. Kalai (2019) studied the relationship between FDI, trade, and economic advancement in the Middle East and North Africa (MENA) region and revealed that FDI inflows significantly promote economic advancement. Kolade (2019) examined the impact of FDI on economic growth in Nigeria within the period of 1986-2017 using descriptive and regression analysis revealed that interest rate has a positive but insignificant impact on GDP, exchange rate has a positive and significant impact on GDP while FDI inflows has a positive and significant impact on GDP. Najeh (2019) examined the impact of FDI on economic growth: evidence from Tunisia for the period of 1980-2015 using ARDL discovered that FDI has positive and significant impact on economic growth in both the short run and long run while human capital and domestic investment has a positive impact on economic growth. On the other hand, the degree of trade openness has a negative effect on economic growth in both the short run and long run.

More so, Oyegoke (2021) investigates the effects of FDI inflow and FDI outflow on economic growth with evidence from Nigeria for the period 1970-20. The OLS single regression result shows FDI inflow has a positive impact on the economy and on the other hand, FDI outflow has a negative effect on economic growth, though not significant. Ahmed (2019) studied the impact of FDI inflows and outflows on economic growth of developed and developing countries such as USA, UK and France and developing countries such as Turkey, Malaysia and Iran from 1980-2017 using ARDL where it was discovered that FDI inflows and outflows for developed countries (USA and UK) have a positive impact on GP while France has a negative impact on GDP and FDI inflows and outflows of all developing countries looked at in the study have positive impact on economic growth. Abinado (2023) examined the relationship between

trade openness and economic growth from 1990-2021 using descriptive statistics, Augmented Dickey Fuller (ADF), Cointegration test and ECM, it was discovered that trade openness has a positive and significant impact on GDP. Oziengbe (2019) examined the effect of financial openness on FDI inflows in Nigeria using data that span the period from 1981 to 2016.The FMOLS estimator is employed. The study finds that financial openness is negatively and significantly related to FDI inflows, but its interaction with political regime is positive and significant.

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2.5 Gap in Empirical Literature

This study is an improvement on other studies reviewed in this research. while other studies utilized co-integration test, vector error correction model, and autoregressive distributed lag (ARDL) model in their estimation; this study improved on their research efforts by extending the estimation techniques to Kernel-Based Regularized Least Squares (KRLS) approach. This method attempts to bridge the argument surrounding linear and non-linear economic model.

3. Theoretical Model

To empirically evaluate the impact of cross-border investment on economic growth in Nigeria from 1981 to 2022, cross-border investment was decomposed into foreign direct investment inflows and foreign direct investment outflows. The unit root test, autoregressive distributed lag (ARDL) model and Kernel-Based Regularized Least Squares (KRLS) model are methods utilized in the analysis. The functional model used for the estimation included the variables such as gross domestic product (GDP), foreign direct investment inflows, foreign direct investment outflows, gross domestic product per capital, exchange rate, and inflation rate. Data on these variables were sourced from the Central Bank of Nigeria (CBN) statistical bulletin, volume 33, 2022, and World Bank Development Indicators, 2022 data report.

3.2 Model Specification

The model specification of this study follows the theoretical model of the exogenous or neo-classical growth model of Solow-Swan (1956 and 1957) and the Mundell-Fleming model. The Solow-Swan theoretical model assumes that economic growth is function of the accumulation of exogenous factors of production such as stock of capital and labour. It used the Cobb-Douglas production function or aggregate production function such as capital input (both domestic and foreign), labour input, and the rate of technological progress explain economic growth in the economy. The capital accumulation contributes directly to economic growth in proportion to capital's share of national output. Through the exogenous growth model, foreign direct investment (FDI) affects economic growth directly via capital accumulation and the inclusion of new inputs and foreign technologies in the production function. Therefore, the exogenous

growth model unveils that FDI promotes economic growth by increasing the amount and the efficiency of investment in the host domestic economy. The Cobb-Douglas production function was used to express the exogenous growth model as shown below:

$$Q = AL^{\beta} K^{\alpha} \quad 2$$

Where; Q = quantity of output produced, L = quantity of labour force employed in production, K = capital input used in production A = technological progress, as it captures variables that account for effects in technological progress; β is the output elasticity of labour while α output elasticity of capital. The equation 1 was modified in the work of Waithe et al, (2011) as study specified the total factor productivity function thus:

$$Y_t = A_t K_t^{\alpha} L_t^{\beta} \quad 3$$

Where Y_t denotes aggregate output in the economy at period t; A_t represents total factor productivity level; K_t and L_t depict levels of capital stock and labour stock, respectively; and α and β are the output elasticity of capital and labour

On the other hand, the Mundell-Fleming model also referred to as IS-LM-BOP model is an extension of the IS-LM model to integrate open economy. Both the product and capital markets were integrated internationally for the purpose of providing good knowledge on how output is determined in an economy. In the international domain, the Mundell-Fleming model integrates finance and foreign trade into macroeconomic theory. The model is closely related to the IS-LM model. Meanwhile, the both models assume that the interest rate is fixed and then indicates the causes of short-run changes in aggregate output, and aggregate demand curve shifts in an economy. Considering the commodity and money markets, interest rate is the major determinants of equilibrium in the markets, while interest rate is fixed under the Mundell-Fleming framework, and equilibrium in both markets is indicated by changes in the nominal exchange rate. In the Mundell-Fleming model, an open economy is described by four equations shown below.

$$Y = C(Y-T) + I(r) + G + NX(\varepsilon) \quad 4$$

$$e = (1 + i)Ee'/(1 + i^*) \quad 5$$

$$\varepsilon = ep / P^* \quad 6$$

$$r = i - E\,\pi \quad 7$$

The equation 3shows commodity market; and the equation 4 look into the interest rate parity condition and revealed equilibrium in the foreign exchange market. More so, the equation 5 describes the real exchange rate, and the equation 6 is the fisher equation which deals with the nexus between nominal interest rate, real interest rate and the expected inflation. In summary, the four equations determine the equilibrium positions for the four endogenous variables including real exchange rate, real interest rate, nominal exchange rate and income.

In Mundell-Fleming model, the exchange rate is the main determinants of the level of foreign trade in any economy. This model was used in the work of by Flavio (2016) in his study on the effect of exchange rate movement on foreign trade. In the study, foreign trade was model was modeled as a function of exchange rate, gross domestic product, investment and inflation. The equation below shows relationship between the variables:

$$FT = f(EXR, GDP, FDI, INF) \quad 8$$

Where FT is the foreign trade, EXR denotes exchange rate, GDP represents gross domestic product, FDI is the foreign direct investment and INF connotes inflation.

In order to realize the objectives of this study, we modify equation 7 to get equation 8 by having equation 2 and 3 integrated and modified to include gross domestic product, trade openness, FDI inflows and FDI outflows. This boils down to the role they play in facilitating growth and development of the economy. Hence, the modification model is presented in a functional form as shown in equation 8 below:

$$GDP = f(INFDI,\ OUTFDI, GDPPC, EXR, INF) \quad 9$$

Where; GDP represents gross domestic product, INFDI is the foreign direct investment inflow, OUTFDI is the foreign direct investment outflow.

In linear function, the relationship is specified thus:

$$GDP_t = \emptyset_0 + \emptyset_1 INFDI_t + \emptyset_2 OUTFDI_t + \emptyset_3 GDPPC_t + \emptyset_4 EXR_t + \emptyset_5 INF_t \varepsilon_t \quad 10$$

We log equation 9 to get the log function; it is illustrated in equation 10 as:

$$linGDP_t = \emptyset_0 + \emptyset_1 INFDI_t + \emptyset_2 OUTFDI_t + \emptyset_3 linGDPPC_t + \emptyset_4 linEXR_t + \emptyset_3 INF_t + \varepsilon_t \quad 11$$

Where; linGDP is the explained variable; whereas INFDI, OUTFDI, linGDPPC, linEXR and INF are the explanatory variables; $\varepsilon_t$is error term; φ_0 = constant term; log is the log function of the equations, whereas φ_s are the coefficients of the regression equation.

3.3 A priori expectation

Theoretically, the study expects that foreign direct investment inflow, GDP per capita and exchange rate would have positive relationship with GDP, while FDI outflow and inflation rate are expected to have negative relationship with the GDP. The patterns of the a priori expectation behavior of the variables in relation to their parameters in the equation are: $\varphi1>0$, $\varphi2>0$, $\varphi3>0$, $\varphi4<0$, $\varphi5<0$.

3.4 Estimation Procedure

The estimation procedure of this study ranges from the unit root tests via the models of the Augmented Dickey-Fuller (ADF) stationarity root test and Zivot-Andrews structural adjusted unit root test, the Auto-Regressive Distributed Lag (ARDL) model, dynamic ARDL simulation model to Kernel-Based Regularized Least Squares (KRLS) model. Stata 16 will be used for the estimation. These estimation procedures are outlined below:

3.4.1 Unit root test

Augmented Dickey-Fuller (ADF) test

The Augmented Dickey-Fuller (ADF) stationarity unit root test will be employed to unveil the order of integration among the variables of the study. This test rejects the null hypothesis of unit root in the variable if the ADF statistic is greater than 0.05 critical value. The generic model for the ADF unit root with trend and intercept are given as:

$$\Delta logY_t = a_0 + \rho_t + a_1 logY_{t-1} + \sum_{i=1}^{n} a_1 \Delta logY_{t-i} + e_t \quad 12$$

Where; GDP, INFDI, OUTFDI and TOP denoted by Y which are the variables whose order of integration are being determined, Δ = first difference operator in a manner that $\Delta GDP_{t-1} = GDP_t - GDP_{t-1}$, $\Delta INFDI_{t-1} = INFDI_t - FDI_{t-1}$, $\Delta OUTFDI_{t-1} = OUTFDI_{t-1}$, $\Delta GDPPC_{t-1} = GDPPC_t - GDPPC_{t-1}$, … $\Delta INF_{t-1} = INF_t - INF_{t-1}$, α_0 = constant term, t = linear time trend of the series, n = the optimum number of lags, and et is the stochastic variable. Thus, if the test at levels failed to reject the test, it shows absence of unit root in the variable, and it is integrated of order zero.

But if it fails to reject the test at levels but rejected it at first differencing, the result shows that there is one unit root in the variable, hence, it implies that the variable is integrated of order one.

Zivot-Andrews (ZA) Structural Adjusted Unit Root Test

Structural adjusted unit root model was developed by the Zivot and Andrews (1992) in attempt to modify the Phillips-Perron unit root model with the view of determining an exogenously break date into an unconditional unit root model. Rather than treating break date as constant, ZA model estimated break date. The model used intervention outlier model for changing growth model instead of additive outlier model as applied by the Phillips-Perron unit root model. The generic model of the ZA model is expressed below:

$$logY^{B}{}_{t} = \hat{\alpha}^{B} logY_{t-1} + \sum_{i=1}^{k} \hat{C}_i^{\,B}\, \Delta logY^{B}{}_{t-1} + \hat{\varepsilon}_t \quad 13$$

Where, $\widehat{GDP}^{B}{}_{t}$, $\widehat{INFDI}^{B}{}_{t}$, $OUTFDI^{B}{}_{t}$, $GDPPC^{B}{}_{t}$, $EXR^{B}{}_{t}$ and $INF^{B}{}_{t}$ denoted by Y_t are the residuals from a regression with GDP, FDII, FDIO and TOP as the explained variables and where the explanatory variables contains a constant, time trend and deterministic trend. More so, it treats structural break as an endogenous occurrence and the null hypothesis for the model is expressed thus:

$$linGDP_t = \alpha_0 + linGDP_{t-1}e_t \quad 14$$

$$INFDI_t = \alpha_0 + INFDI_{t-1}e_t \quad 15$$

$$OUTFDI = \alpha_0 + OUTFDI_{t-1}e_t \quad 16$$

$$linGDPPC_t = \alpha_0 + linGDPPC_{t-1}e_t \quad 17$$

$$linEXR = \alpha_0 + linEXR_{t-1}e_t \quad 18$$

$$INF_t = \alpha_0 + INF_{t-1}e_t \quad 19$$

The chosen breakdown of the variable was taken in view of the results of the estimation procedure, designed to fit regressed to a determine trend stationary representation. ZA model assumed that the option hypothesis specifies that the regressed can be a trend stationary process with a break in the trend which surfaces at an unspecified period.

3.4.2 Autoregressive Distributed Lag (DARDL) Model

The ARDL is a co-integration test engaged especially when the research sort to investigate the long-run relationship and short-run interactions among the variables under study. It is most suitable in research when there is mixed order of integration. The beauty of the Autoregressive Distributed Lagged (ARDL) is that it can be applied even when the sample size of the series is small. However, if co-integration exists, the ARDL is reparameterized into error correction model (ECM) to account for both the short term and long term effect of explanatory variables on the regressed. The distributed lag connotes the inclusion of lagged regressors in the model. The outcome of its estimation indicates whether the variables are co-integrated or not. The model is shown as:

$$\begin{aligned}\Delta linGDP_t = \omega_0 + &\sum_{i=1}^{p} \omega_1\, IinGDP_{t-i} + \sum_{i=1}^{p} \omega_2\, INFDI_{t-i} + \sum_{i=1}^{p} \omega_3\, OUTFDI_{t-i} + \sum_{i=1}^{p} \omega_4\, linGDPPC_{t-i} \\ &+ \sum_{i=1}^{p} \omega_5\, linEXR_{t-i} + \sum_{i=1}^{p} \omega_6\, INF_{t-i} + \varnothing_1 INFDI_t + \varnothing_2 OUTFDI_t + \varnothing_3 linGDPPC_t \\ &+ \varnothing_4 linEXR_t + \varnothing_5 INF_t + \varnothing_4 ECT_{t-1} \\ &+ \varepsilon_t \end{aligned} \quad 20$$

In equation 17, GDP represents gross domestic product, INFDI is the foreign direct investment inflows, OUTFDI denotes foreign direct investment outflows, GDPPC stands for GDP per capita, EXR represents exchange rate and INF is the inflation rate. Similarly, ECT stands for error

correction term, log is the log function, ε is the scholastic variable, p is the maximum lag-length. The symbol Δrepresents first difference.$\omega_1 - \omega_5$ measures the short-run effect while $ø_1 - ø_4$ determine the long-run effect.

Engle (1987) observed that error correction term occurs when the variables are shown to be co-integrated equations. If co-integrated, it means that there is linear combination among the variables. The error-correction term (ECT) measures speed of adjustment and the degree at which the short-run deviation is adjusted towards long-run relationship. Therefore, ARDL bounds cointegration includes estimating equation 33 and confining the variables of the lag level variables to zero. The model also checks the hypothesis from equation 17 as expressed below:

H_0: $\varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = 0$
H_1: $\varphi_1 \neq \varphi_2 \neq \varphi_3 \neq \varphi_4 \neq \varphi_5 \neq 0$

In estimating the bound model, the F-statistic is then compared with the Pesaran, Shin and Smith (2001) with two asymptotic critical value limits to ascertain evidence of long-run relationship among the equations. The error correction model (ECM) in generic form is specified as:

$$\Delta linGDP_t = \delta_0 + \sum_{i=1}^{n} \delta_{1i}\, \Delta linGDP_{t-i} + \sum_{i=1}^{n} \delta_{2j}\, \Delta INFDI_{t-i} + \sum_{i=1}^{n} \delta_{3i}\, \Delta OUTFDI_{t-i} + \sum_{i=1}^{n} \delta_{4i}\, linGDPPC_{t-i} + \sum_{i=1}^{n} \delta_{5j}\, \Delta linEXR_{t-i} + \sum_{i=1}^{n} \delta_{6i}\, \Delta INF_{t-i} + \lambda ECM_{t-1} + u_t \quad (21)$$

Even though the ARDL model requires no pre-test for unit root, to circumvent ARDL model crashing in the presence of integrated stochastic trend of I(2), the unit root test is crucial to determine number of unit roots in the series used in the investigation and to also enable the study choose suitable econometric model for estimation of the variables.

3.4.3 Kernel-Based Regularized Least Square (KRLS) Model

The Kernel-based Regularized Least Squares (KRLS), a machine learning algorithm is applied in the research as estimation boost. It implements the pointwise derivatives to determine the causal-effect relationship. It accounts for pointwise marginal effect of the explained variables with respect to changes in the explanatory variables. The model is shown below:

$$k(xj, xi) = e^{-\frac{IIx_j - x_iII^2}{\sigma^2}} \quad (22)$$

In equation 21, $IIx_j - x_iII$ stands for the Euclidean distance between the covariate vectors x_j and x_i. The equation equals normal distribution, σ^2. However, it is essential to note that the KRLS model as well captures non-linear models, and the sample average pointwise marginal effects provide only a summary. For instance, a covariate could have positive marginal effects on one area of the covariate space and a negative effect in the other hand, but the average marginal effect may be near to zero. To this effect, KRLS allows for interpretation beyond these average values. In particular, KRLS provides researchers with a means to directly examine marginal effect heterogeneity as well as interpretation of interactions.

4. Results and Discussion

4.1 Unit Root Test

The unit root test is conducted mainly to determine the level of integration of the variables of the study, using the Augmented Dickey-Fuller (ADF) unit root test Zivot-Andrews structural adjusted unit root test. The results are indicated in Table 1 below.

Table 1: Unit Root Test

Variables	Level Diff ADF	1st Diff ADF	Level Diff ZA	1st Diff ZA	Rank
linGDP	-1.463	-3.488**	**-3.059**	**-5.015****	I(1)
INFDI	-3.721*	-9.851**	-4.827*	-10.191**	I(0)
OUTFDI	-4.236*	-9.069**	-5.682*	-9.530**	I(0)
linGDPPC	-1.490	-5.232**	-3.579	-5.655 **	I(1)
linEXR	-2.167	-5.431**	-2.942	-6.149**	I(1)
INF	-3.050*	-5.903**	-5.014*	-8.088 **	I(0)

Sources: Computation from Stata 16.0, 2024

Note: ADF stands for the Augmented Dickey-Fuller unit root test, while ZA denotes the Zivot-Andrews structural adjusted unit root test; * and ** indicate rejection of null hypothesis at 5% significance level. From the results, all the variables except INFDI, OUTFDI and INF were non-stationary at level both at the ADF and ZA levels. But at first differencing, the non-stationarity variables indicate stationarity, implying that the variables have long-run property tendencies. Hence, their mean, variance and co-variance are constant over time.

Optimal Lag Length Criteria

Table 2: Selection-Order Criteria

Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-294.873				0.303679	15.8354	15.9274	16.094
1	-73.1756	443.39	36	0.000	0.000018	6.06187	6.70584	7.87184
2	-14.408	117.54	36	0.000	6.2e-06	4.86358	6.05953	8.22494
3	65.2697	159.36	36	0.000	9.5e-07	2.56475	4.31268	7.47751
4	151.863	173.19*	36	0.000	1.8e-07*	-0.098029*	2.20187*	6.36613*

Source: Computation from Stata 16.0, 2024

The results in Table 2 show the optimal lag length selection-order criterion. In the Table 2, the optimal lag length selected is lag 4 with more concentration of the Akaike information criterion (AIC).

4.2 Autoregressive Distributed Lag (ARDL) Model Estimation

The application of the autoregressive distributed lag (ARDL) model in the investigation was as a result of the unit root tests' outcomes, in which the results showed mixed of integration including I(0) and I(1). Thus, the ARDL model was utilized to determine the state of its long-run equilibrium relationship and short-run dynamics of the variables of the study. The results are expressed in the Tables below:

Table 3: ARDL Estimation Model

EQN	COEF.	Estimate	SE	t-Stat	P-Value	Min 95	Max 95
ECT	L_1linGDP	-0.260907	0.0797297	-3.27	0.006**	-0.4331525	-0.0886615
Long-Run	L_1INFDI	0.1297683	0.1124321	1.15	0.269	-0.1131265	0.3726632
	L_1OUTFDI	-0.6023505	0.2359412	-2.55	0.024**	-1.11207	-0.0926306
	L_1linGDPPC	0.7912205	0.1636533	4.83	0.000**	0.4376689	1.144772
	L_1linEXR	1.044108	0.0350208	29.81	0.000**	0.9684503	1.119766
	L_1INF	0.0294846	0.0132588	2.22	0.045**	0.0008406	0.0581286
	_Cons	0.1921746	1.124251	0.17	0.867	-2.236623	2.620972

Short-Run	LDlinGDP	-0.4911246	0.1425468	-3.45	0.004**	-0.7990782	-0.1831711
	L_3linFDI	0.0196179	0.0088636	2.21	0.045**	0.0004694	0.0387665
	Δ_1OUTFDI	-0.0713628	0.0274343	-2.60	0.022**	-0.1306311	-0.0120945
	$\Delta_1$linGDPPC	0.3305751	0.0700184	4.72	0.000**	0.1793094	.4818407
	$\Delta_1$linEXR	0.2260233	0.0506615	4.46	0.001	0.1165758	0.3354709
	Δ_1INF	0.0039163	0.0005837	6.71	0.000	0.0026552	0.0051774
ARDL(4,4,2,3,2,4)	**OBS**	**38**		**R^2**	**0.9874**	**Root MSE**	**0.0211**

Source: Computation from Stata 16.0, 2024

Table 3 shows the ARDL estimation results, for which SE denotes standard error; ** indicates statistical significance at 5% level. The results revealed that foreign direct investment inflows (L_1INFDI) with a coefficient of 0.1297683 and a p-value of 0.269 has no significant influence on gross domestic product (linGDP); while foreign direct investment outflows (L_1OUTFDI) indicating a coefficient of -0.6023505 with a p-value of 0.024 has a significant but negative impact on gross domestic product in the economy in the long-run. In the same vein, the results showed that GDP per capita (L_1linGDPPC) with a coefficient of 0.7912205 and a p-value of 0.000, exchange rate (L_1linEXR) reporting a coefficient of 1.044108 and a p-value of 0.000, and inflation rate (L_1INF) with a coefficient of 0.0294846 and a p-value of 0.045 have a significant and positive impact on gross domestic product in the long-run. On the other hands, the results unveiled that all the variables in the short-run such as foreign direct investment inflows with a coefficient of 0.0196179 and a p-value of 0.045, GDP per capita reporting a coefficient of 0.3305751 and a probability value of 0.000, exchange rate showing a coefficient of 0.2260233 and p-value of 0.001, and inflation rate with a coefficient of 0.0039163 and a p-value of 0.000 exert significant and positive influence on economic growth (linGDP); while foreign direct investment outflows (L_1OUTFDI) has significant but negative impact on economic growth (linGDP) in the short-run in Nigeria.

Furthermore, the error correction term ECT(-1) indicated a coefficient value of -0.260907 with a p-value of 0.006. The coefficient of the error correction term (ECT) showed as speed of adjustment is negative, fractional, and significant. As anticipated, the parameter borders between 0 and -1 for convergence to occur. Thus, the result means that linGDP adjusts to INFDI, OUTFDI, linGDPPC, linEXR, and INF in equilibrium long-run relationship. Hence, the system corrects its short-run deviation at a speed of 26.1% towards long-run relationship in a year. Similarly, the result revealed a multiple coefficient of determination (R^2) value of 0.9874, implying that 98.7% of the changes in the gross domestic product is accounted for by the independent variables such as INFDI, OUTFDI, linGDPPC, linEXR, and INF, while the remaining 1.3% is attributed by other variables excluded from the regression model. The result also has shown a root mean square error (Root MSE) of 0.0211, which indicates low average prediction error of 0.02% in the estimation results. The result is in line with the classical economic theory of foreign direct investment, which negative relationship between economic growth and foreign direct investment in the economy.

4.3 ARDL Bounds Test

Considering the unit root properties status of the sampled variables alongside the estimated variables via the ARDL model, the research went on to investigate the cointegration relationship among the variables through the modified Pesaran, Shin, and Smith (2001) ARDL bounds test with Kripfganz and Schneider critical values. Based on ARDL (4,4,2,3,2,4), the results are expressed below:

Table 4: Pesaran, Shin, and Smith bounds test

		10%		5%		1%		KS Critical Bands	
	K	**1(0)**	**I(1)**	**1(0)**	**I(1)**	**1(0)**	**I(1)**	**1(0)**	**I(1)**
F	7.352	2.08	3.00	2.39	3.38	2.70	3.73	3.06	4.15
t	-3.272	-2.57	-3.86	-2.86	-4.19	-3.13	-4.46	-3.43	-4.79

Source: Computation from Stata 16.0

In the Table 4, I(0) and I(1) indicate the lower and upper critical band at 10%, 5% and 1% significant level of the Pesaran, Shin, and Smith ARDL bounds test. As a decision rule, accept if F-calculated is less than critical value for I(0) regressors or reject if F-calculated is greater than critical value for I(1) regressors. Table 4 reveals the ARDL bounds test results for co-integration among the variables of the study. The estimated F-statistic based on a sample of 6 variables, and 38 observations is 7.352 whereas t- statistic is -3.272. The F-statistic of 7.352 is greater than the upper bound critical values (4.15) at 5% significance level and above the critical values of all I(1) variables in 10% and 1% levels, as well as the KS critical values. Thus, the study rejects the null hypothesis of no relationship level as both PSS bounds test and Kripfganz-Schneider critical values confirm the existence of long-run equilibrium relationship in the regression model.

4.4 Diagnostic Tests

The diagnostic tests were conducted to test for structural serial correlation, validity and stability of the regression models using the Breusch-Godfrey LM serial correlation, heteroscedasticity, Ramsey Reset and cumulative sum residual tests. The results are shown in the Tables below:

Table 5: ARDL Model Diagnostics

Test	**Model**	**lags(*p*)**	**Chi2**	**Df**	**Prob > chi2**
Test for serial correlation	Breusch-Godfrey LM Test	1	0.888	1	0.3461
Test for Heteroskedasticity	(ARCH) test	1	1.805	1	0.1791
Test for model misspecification	Ramsey RESET test	**F(3, 11)**		**Prob > F**	
		0.91		0.4718	

Source: Computation from Stata 16.0 result, 2024

The null hypotheses tested are the coefficients lag 1 gross domestic product (L_1linGDP), lag 1 foreign direct investment inflows (L_1INFDI), lag1 foreign direct investment outflows (L_1OUTFDI), lag 1 GDP per capita (L_1linGDPPCC), lag 1 exchange rate (L_1linEXR) and lag 1 inflation rate (L_1INF). The short-run and long-run tests returned Chi-Squares for serial correlation test was 0.888 with a probability value of 0.3461, heterosedasticity test result reported a Chi-Square value of 1.805 and a p-value of 0.1791, while model misspecification test returned F-statistic value of 0.91 with a p-value of 0.4718.

In all, the p-values are not significant at 5% level, implying that the null hypotheses are not rejected in each case. These mean that there are no serial correlation, heteroscedasticity and misspecification model in the regression equations. In other words, the relationship between cross-border investment coefficient variables and the gross domestic product in the 6 sample variable is stable, reliable and has goodness of fit. As such the estimation results would be used to predict future economic conditions.

Stability Test

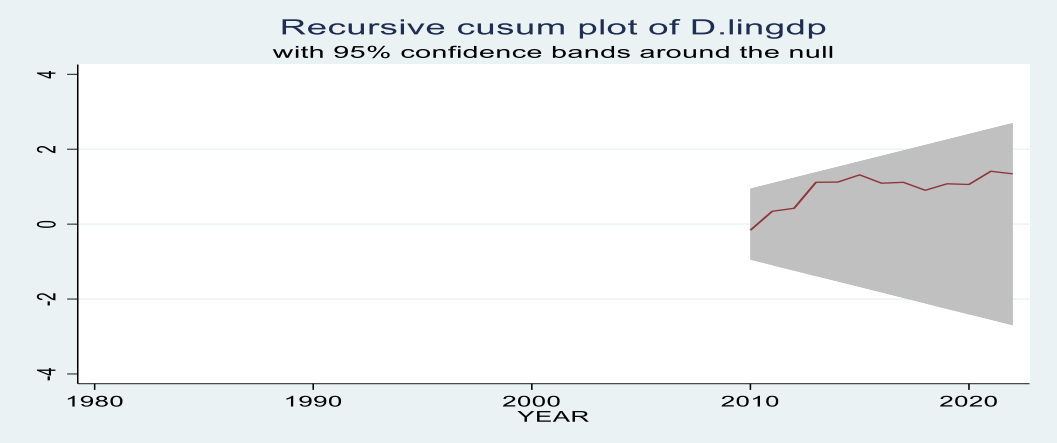

Figure 1: Cumulative Sum (CUSUM) Residuals Test

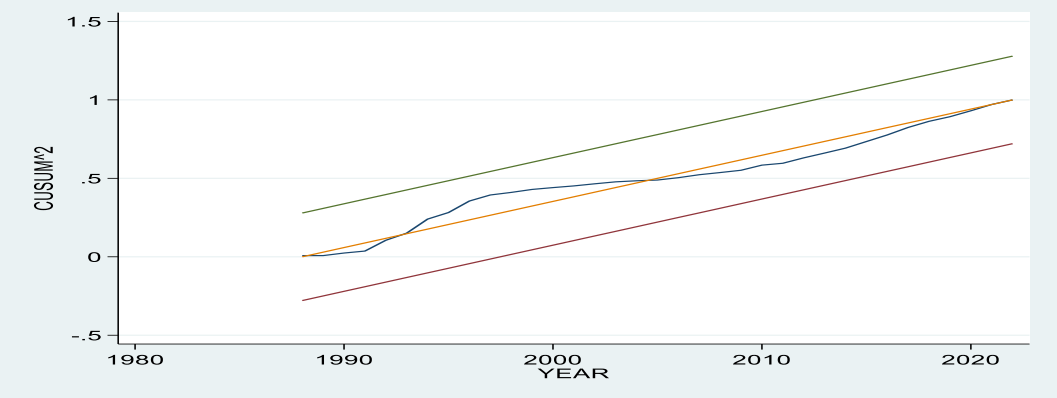

Figure 2: Cumulative Sum (CUSUM) Square Test

The cumulative sum (CUSUM) residuals test is employed to determine the structural changes in the parameters of regression model, whereas the cumulative sum squares (CUSUMSQ) detects sudden changes in the constancy of the regression parameters of the error term. From Figures 1 and 2, the results showed that there are stabilities in the parameters of the regression equations at both the CUSUM residuals and the CUSUMSQ just as the plots lie in-between the critical bands at a 5% level of significance.

4.3 Kernel-Based Regularized Least Squares (KRLS) Estimates

The KRLS model implements pointwise derivatives mainly to determine the marginal effects of gross domestic product. Hence, the study examines the structural adjustments in the growth of domestic product via empirical estimation utilizing marginal effects technique.

Table 6: Pointwise Derivatives using KRLS

linGDP	Avg.	SE	T	P>|t|	P25	P50	P75
INFDI	-0.048091	0.029738	-1.617	0.114	-0.286455	-0.117392	0.21543
OUTDI	0.019294	0.09991	0.193	0.848	-0.660398	0.119131	.59772
linGDPPC	0.503192	0.044506	11.306	0.000	0.149411	0.616413	0.899107
linEXR	0.563921	0.013954	40.414	0.000	0.311385	0.562948	0.771428
INF	0.004583	0.002787	1.644	0.109	-0.001798	0.003041	0.019102
Diagnostics							
Lambda	0.07562	Sigma	5	R^2	0.9979	Obs	42
Tolerance	0.042	Eff.Df	22.47	Looloss	5.553		

Source: Computation from Stata 16.0, 2024

Table 6 unveils the result of the average marginal effects of foreign direct investment inflows, foreign direct investment outflows, GDP per capita, exchange rate and inflation rate including their standard errors, t statistics and p-values. At 5% significance level, the results revealed statistically significant with a predictive power of 0.9979, indicating that the explanatory variables account for 99.8 percent changes in the changes in the gross domestic products. Furthermore, the results showed heterogeneous marginal effects, as the derivatives of the explanatory variables are shown as P25, P50 and P75 percentiles in the Table 6. The result reported evidence of heterogeneous marginal effects in the sampled variables, thereby authenticating the robustness of the pointwise derivatives. This implies that the mean average marginal effect of foreign direct investment inflows, foreign direct investment outflows, GDP per capita, exchange rate and inflation rate on gross domestic savings are -0.04, 0.02, 0.5, 0.6, and 0.005 percentage points, respectively.

In comparing the results of the conventional ARDL with that of KRLS, the KRLS results reported that GDP per capita with a coefficient of 0.503192 and a p-value of 0.000, and exchange rate coefficient of 0.563921 with p-value of 0.000 had significant and positive average marginal impacts on gross domestic product in the long-run. However, the results unveiled that foreign direct investment inflows with a coefficient of -0.048091 and a p-value of 0.114, foreign direct investment outflows with a coefficient of 0.019294 and a p-value of 0.848, and inflation rate having a coefficient of 0.004583 with a probability value of 0.109 had no significant average marginal influence on gross domestic product (linGDP) in the long-run. But in the ARDL estimation results, all the variables except foreign direct investment inflows with a coefficient of 0.1297683 and a p-value of 0.269 had significant and positive impact on linGDP in the long-run, while in the short-run, all the variables were significant though foreign direct investment outflows indicated negative impact on linGDP. More so, the estimate of the average marginal effect is larger, indicating that a percentage point rise in foreign direct investment inflows will decrease linGDP average marginal effects by 0.05 percentage points, and a percentage increase in foreign direct investment outflows improves linGDP average marginal influence by 0.02 percentage points. Similarly, a percentage rise in GDP per capita impacts a 0.5 percentage point increase in gross domestic product on average. In the same way, exchange rate had significant and positive average marginal effect on gross domestic product, showing that exchange rate exert a 0.6 percentage point increase on gross domestic product on average at a percentage increases. Furthermore, inflation rate also has a significant and positive average marginal effect on gross domestic product, and indicates that a percentage rise in inflation rate has a 0.005 percentage point improvement in gross domestic product in Nigeria.

In summary, the improved model fit further authenticate that the relationship among foreign direct investment inflows, foreign direct investment outflows, GDP per capita, exchange rate, and inflation rate are not linear as implied by the ARDL-based OLS model. However, the relationship has been shown to be non-linear model, which KRLS equation fit appropriately, learns the trend of the conditional expectation of the functional relationship of the models.

Table 7: Distribution of the Marginal effects

sum d_infdi, detail

d_infdi

	Percentiles	Smallest		
1%	-0.6123216	-0.6123216		
5%	-0.4199635	-0.5179064		
10%	-0.3523943	-0.4199635	Obs	42
25%	-0.2864549	-0.3582947	Sum of Wgt.	42
50%	-0.1173917		Mean	-0.048091

	Largest		Std. Dev.	0.319963
75%	0.2154301	0.4928056		
90%	0.4290127	0.5177431	Variance	0.1023763
95%	0.5177431	0.6434422	Skewness	0.6244881
99%	0.6622707	0.6622707	Kurtosis	2.497399

Source: Computation from Stata 16.0

Table 7 shows the results of the detailed average marginal effects of gross domestic product. The estimation results reported that the average marginal effect of foreign direct investment inflows is 0.05, while that of foreign direct investment outflows is 0.02 which are in tandem with the quantities displayed in the KRLS Table 6 under the Avg. column for foreign direct investment inflows and foreign direct investment outflows. These quantities are akin to the coefficient estimates from the linear regression as they can be interpreted as average marginal effects. The results also clearly revealed the heterogeneity in the marginal effects. For instance, at the 1st quartiles, a 1% increase in foreign direct investment inflows is associated with a -0.3 percentage point declines in average marginal effects of gross domestic product, whereas at the 3rd quartiles, a 1% rise in foreign direct investment inflows exert a 0.2 percentage rise in average marginal effects of gross domestic product in Nigeria. The median of the average marginal effects of gross domestic product is -0.1 percentage fall in average marginal effects of GDP.

Derivative of the Non-Linear Conditional Model

The revealed results in Figures 3 and 4 indicate how the marginal effect estimates from KRLS accurately track the derivative of the non-linear conditional nexus in the estimation model.

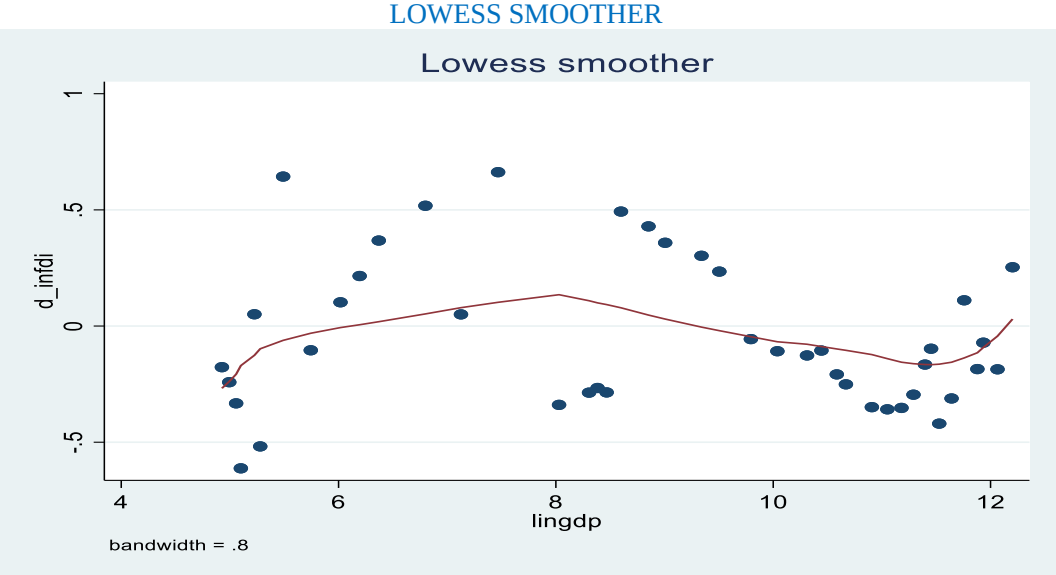

Figure 3: Marginal effect of INFDI on linGDP

LOWESS SMOOTHER

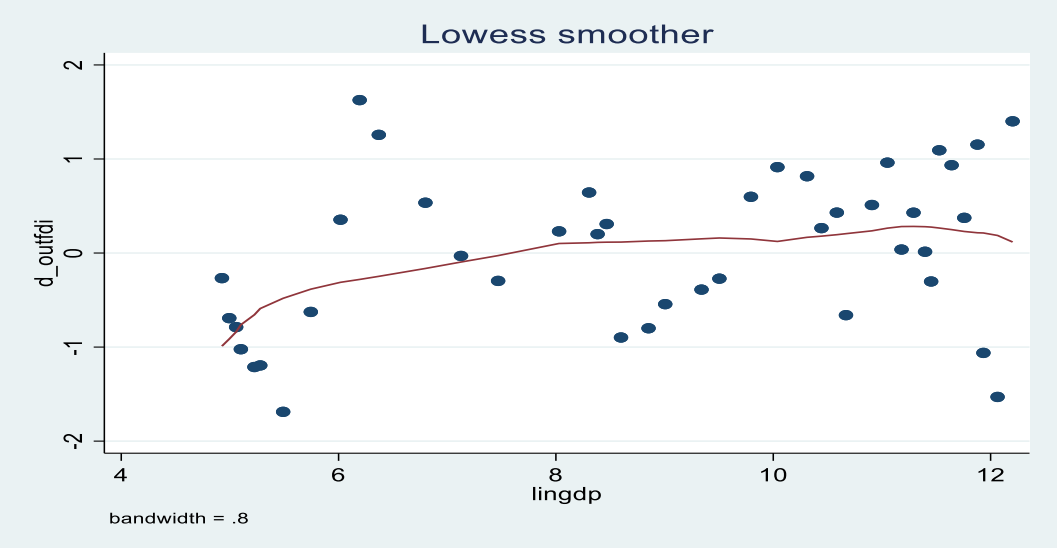

Figure 4: Marginal effect of OUTFDI on linGDP

Showing the interpretive gains of KRLS results, this estimation model was under taken to fit in a full model and thus, compares the results estimated using the ARDL with that KRLS in detail. As reported in Figures 3 and 4, the KRLS model was able to provide a flexible fit, improving on both in- and out of the model accuracy. Therefore, this study concludes that economic model is associated with non-linear economic model.

4.5 Policy Implication of the results

From the estimation, the KRLS results showed that foreign direct investment inflows had no significant but indicates declining average marginal effects on gross domestic product, while foreign direct investment outflows also showed no significant but increasing average marginal impact on gross domestic product in the economy. Contrarily, the results reported that GDP per capita and exchange rate exert significant and increasing average marginal effects on gross domestic product while inflation rate showed no significant but decreasing average marginal influence on the gross domestic product. By implication, a percentage rise in foreign direct investment inflows will decrease average marginal effects of gross domestic product by 0.05. The negative average marginal effects indicated by the result shows that domestic investment policies in Nigeria are unfavourable to foreign direct investment to thrive in the country. Similarly, a 1% increase in foreign direct investment outflows will bring about 0.02% increases in gross domestic product. Similarly, it is estimated on the average that a 1% increase in GDP per capita results in 0.5% increase in the average marginal effect of GDP growth, and again, a percentage improvement in inflation rate promotes GDP average marginal effect by 0.004% SMEs output in the economy.

4. Contribution to Knowledge in Literature

This research contributed to pool of knowledge in literature by applying KRLS model to tackle both linear and non-linear economic models. Hence, the study discovered that the relationship between cross-border investment and economic growth model is non-linear. The results showed that foreign direct investment inflows had no significant but decreasing average marginal effects on gross domestic product, while foreign direct investment outflows had no significant but increasing average marginal influence on economic growth. Other studies were silent on average marginal effect of variables on economic growth in their investigations.

5. Policy Recommendations

Since the average marginal effects of foreign direct investment inflows and outflows had no significant but decreases and increases average marginal effect on gross domestic product in Nigeria, government should take inward looking economic policies aimed at attracting foreign direct investments in Nigeria. This can be done by granting tax waivers or reducing taxes impose on capital inflows or even on foreign companies operating in the country. More so, insecurity challenges should be severely dealt with to secure foreign capital inflows and protect outflows of foreign direct investment from cyber-crimes. It is in this view, that foreign direct investment can on average affect economic growth of Nigeria significantly and positively.

6 Conclusion

The study evaluated the impact of cross-border investment on economic growth in Nigeria from 1981 to 2022, using the Autoregressive Distributed Lag (ARDL) and Kernel-Based Regularized Least Squares (KRLS) models. The results reported that foreign direct investment inflows and foreign direct investment outflows had no significant but decreases and increases average marginal effects on gross domestic product, respectively, while GDP per capita and exchange rate had significant and increasing average marginal effects on economic growth in Nigeria. It was also indicated that inflation rate exerts no significant influence on economic growth (linGDP) in the economy. Thus, given that inflows and outflows of foreign direct investment are important determinant of economic growth, this study, well researched has made its findings and policy recommendations. It is the conviction of the study that if these policy recommendations are effectively executed by government, it will go a long way in attracting foreign direct investment in Nigeria.

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