International Journal of Multidisciplinary Research and Growth Evaluation.

External Reserve and the Elasticity of Substitution between Domestic and Foreign Investment in Nigeria

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Article Info

ISSN (Online): 2582-7138
Impact Factor (RSIF): 7.98
Volume: 06
Issue: 05
September - October 2025
Received: 04-07-2025
Accepted: 06-08-2025
Published: 25-08-2025
Page No: 125-139

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Astract

Foreign investments, particularly portfolio flows are large and often distortionary as they have tendency to drop during periods of global crisis. They could trigger a crisis because of their volatile nature and depending on the level of country's exposure to external shocks. The motivation for this study is consistent with the conjecture that high foreign investment inflows is consistent with higher reserve accretion and stability in the naira exchange rate. Overtime, there have deliberate policy measures to encourage foreign portfolio inflows. While these inflows, have always had a positive impact on the external reserves, there is always, the palpable fear of flow reversals or the possibility of sudden stop due to unforeseen crisis. The elasticity of substitution has not received enough attention in studies relating to domestic and foreign investment. In the light of this, our study seeks to investigate how Nigeria's external reserves responds to changes in the domestic and foreign investment behavior. Thus, this paper investigates how Nigeria's external reserves level responds to changes in domestic and foreign investment, thereby showing the kind of deliberate monetary policy adjustments that should be pursued overtime to achieve stability. The finding therefore recommends that the government should focus of domestic investment by expanding its revenue sources in order to allocate more resources for annual capital expenditure. The government should also embark on building capital goods to encourage domestic private investment the production of goods and services suitable to replace imported ones and provide opportunity for export of such goods and services.

DOI: https://doi.org/10.54660/.IJMRGE.2025.6.5.125-139

Keywords: Elasticity of Substitution, External Reserves, Foreign Portfolio Investment, Domestic and Foreign Investment

1. Introduction

For most emerging markets and developing economies (EMDEs), a growing body of evidence and economic theory suggests that the availability of a diverse set of alternative sources of foreign exchange earnings, is important both for external reserve accretion and for macroeconomic stability and economic growth. One way in which some economies have attempted to stabilize their external reserves is to encourage more domestic investment as a major component of economic growth and to dampen the pressure on the external reserves. Thus, the over dependence on imports by most EMDEs has continued to put pressure on their external reserves. The situation which calls for a re-examination has resonated in calls over time on the urgent need to encourage both domestic direct investments, DDI (public investment and private investment) and domestic portfolio investment, DPI (stock, bond, or other financial asset) as a way of safeguarding the external reserves. While the former, (DDI) would boost domestic production and reduce imports with the possibility of improving export earnings in the future, the size of the latter could cushion the vagaries of capital flight from the domestic economy with possibility for the preservation of external reserves.

This also depends on whether the policy measures in place in the domestic economy are sufficient enough to encourage financial disinvestment overseas by domestic residents, i.e., a drop in capital outflows. This would partially offset any sudden drop in foreign portfolio inflows during periods of crisis.

Foreign investments, particularly portfolio flows are large and often distortionary as they have tendency to drop during periods of global crisis. They could trigger a crisis because of their volatile nature and depending on the level of country's exposure to external shocks. Foreign direct investment (FDI) on the other hand is hardly forthcoming because of cyclical fluctuations - trade flows and terms-of-trade fluctuations, structural factors - the dearth of infrastructure and other legacy issues - labour laws, indigenization policies and the legislations around taxes and the ease of doing business in most EMDEs. Foreign portfolio investment (FPI) has thus far, remained a very significant and foremost source of capital flows to most EMDEs. Nigeria continues to remain a major beneficiary of foreign portfolio flows because of favourable yields. Nevertheless, they are very volatile and should be considered with caution.

The motivation for this study is consistent with the conjecture that high foreign investment inflows is consistent with higher reserve accretion and stability in the naira exchange rate. Overtime, there have deliberate policy measures to encourage foreign portfolio inflows. While these inflows, have always had a positive impact on the external reserves, there is always, the palpable fear of flow reversals or the possibility of sudden stop as was witnessed during the 2007/2008 global financial crisis and recently, in the aftermath of the outbreak of the global COVID-19 pandemic when the entire world economy was almost shut down. COVID-19 created a demand shock in the oil market as lockdowns, curfews and social distancing reduced movement and travels; this led to oil price shock. The Pandemic affected transactions in the stock market since oil prices have a positive correlation with the stock market. In May 2020 for example, 70 per cent of the total market transactions at the Nigeria stock exchange, were initiated by domestic investors while the remaining 30 per cent by foreign investors. Of the total N83.91 billion domestic transactions, 50.41 per cent were outflow transactions while 49.59 per cent were inflow transactions (Businessday, June 25, 2020).

The importance of the elasticity of substitution has been canvassed in several literature and has increasingly become a key parameter in international economics for assessing or measuring the substitutability between inputs to a production or utility function. It has, however, not received enough attention in studies relating to domestic and foreign investment. In the light of this, our study seeks to investigate how Nigeria's external reserves responds to changes in the domestic and foreign investment behavior. To achieve this objective, we have introduced the concept of elasticity of substitution in this study to measure how Nigeria's external reserves would respond to changes in domestic and foreign investment behavior and the appropriate monetary policy adjustments necessary to respond to this change. The elasticity of substitution should signal where appropriate responses should be focused on and the soundness of monetary policy decisions. This is important in view of the implications of investment behavior for external reserves sustainability. In our view, the knowledge of the dynamics and differential effects of domestic or foreign investment could be sufficiently strong in swinging policy towards supporting measures that aim to protect domestic investors against competition from their foreign investments and their perverse effects like lowering the returns to domestic investments.

We conjecture that the sensitivity of our Nigeria's external reserves to investment (domestic and foreign), would be low or high depending on their specific attributes. For example, a lower sensitivity of external reserves to foreign investment suggests that local investors are enjoying a higher degree of investor protection at home. As a corollary, countries that observe high standards of corporate governance at home make foreign investors less familiar with problems related to weak investor protection and then less sensitive to issues relating to the choice of the composition of their foreign portfolio. As an ensuing perverse effect, assets issued by well protected foreign countries are those more severely penalized in portfolios held by investing countries featuring stronger investor protection.

Against this background, the paper investigates how Nigeria's external reserves level responds to changes in domestic and foreign investment, thereby showing the kind of deliberate monetary policy adjustments that should be pursued overtime to achieve stability. The reaction is fundamental to a spectrum of policy challenges and decisions in the conduct of monetary policy in Nigeria, particularly as it affects, balance of payments adjustments and the exchange rate pass-through of monetary policy (Auer & Schoenle, 2016) [2].

From our search in the literature thus far and to the best of our knowledge, there is no previous studies on Nigeria's external reserve and the elasticity of substitution that we know of. By implication, therefore, this study is novel in this direction. In terms of data, our study would cover the period January 2010 to December 2019. The choice of 1986 is to capture the Nigeria's transition to economic liberalization following the introduction of a structural adjustment program, SAP. In terms of data calibration, the domestic investment can be disaggregated as domestic direct investment - DDI (gross capital formation) and domestic portfolio investment, DFI (stock, bond, or other financial assets). The foreign investment component can be disaggregated into the traditional foreign direct investment, FDI and foreign portfolio investment, FPI. However, to enable us to situate our analysis in proper perspective, we narrowed our measure of domestic and foreign investments purely to portfolio investment. Therefore, the underlying interrogation is whether the CBN's conduct of monetary policy and particularly, the movement in Nigeria's external reserves reflects significantly on the type of investment flows. Secondly, what weight should the Central Bank of Nigeria attribute to domestic investment over foreign investment drive? One way to answer these questions is simply to compare the elasticities of external reserve responsiveness under different shocks of domestic direct investment, domestic portfolio investment, foreign direct investment and foreign portfolio investment. The foregoing would provide a better understanding of the CBN's preferences and policy focus. This remain critical because of the opportunity cost involved when monetary policy is not properly aligned or targeted.

Limitations and structure of the paper

Due to the dearth of monthly data required for this study

stemming from the rebasing of the Nigeria economy in 2010, we were able to obtain and use monthly data from 2010 to 2019. The rest of the paper is structured as follows: Section 2 provides some stylized facts on external reserves and investment behavior in Nigeria while, Section 3 reviews relevant theoretical and empirical literature on elasticity of substitution. Section 4 discusses the data and methodology, while Section 5 provides the empirical results and analysis. Section 6 concludes the paper.

2. Some Stylize Facts on Domestic and Foreign Investment and External Reserves

2.1. Development in the Nigeria's External Reserves

Nigeria's external reserves accretion has been marred by economic developments globally and domestically. This is overwhelmingly true due to Nigeria's dependence on oil receipt as the major foreign exchange earner since its discovery in commercial quantity in the late 1960s. Accretion to the Nigeria's external reserves peaked in 2008 following a consistent rise in oil prices and relative peace in the Niger Delta region of the country – propelling oil production to a high. This was, however, short-lived as the global financial crisis of 2007 – 2009 took a toll on the Nigerian economy, necessitating the Central Bank of Nigeria to make efforts to stabilize the domestic currency due to the ensuing capital reversals at that time.

The country's external reserves have always been the signaling point for portfolio managers to take investment decisions on the Nigeria economy, thus, whenever there is a looming external shock emanating from the fall in the n=international price of crude oil which Nigeria relies on to shore up external reserves, foreign investors will divest from the Nigeria economy. This is particularly true since empirical works have shown that an inverse relationship exist between oil prices and external reserves accretion in Nigeria. Imarhiagbe (2015) [13] have all proven empirically that periods of increase in oil prices necessitates gradual accretion to external and vice versa.

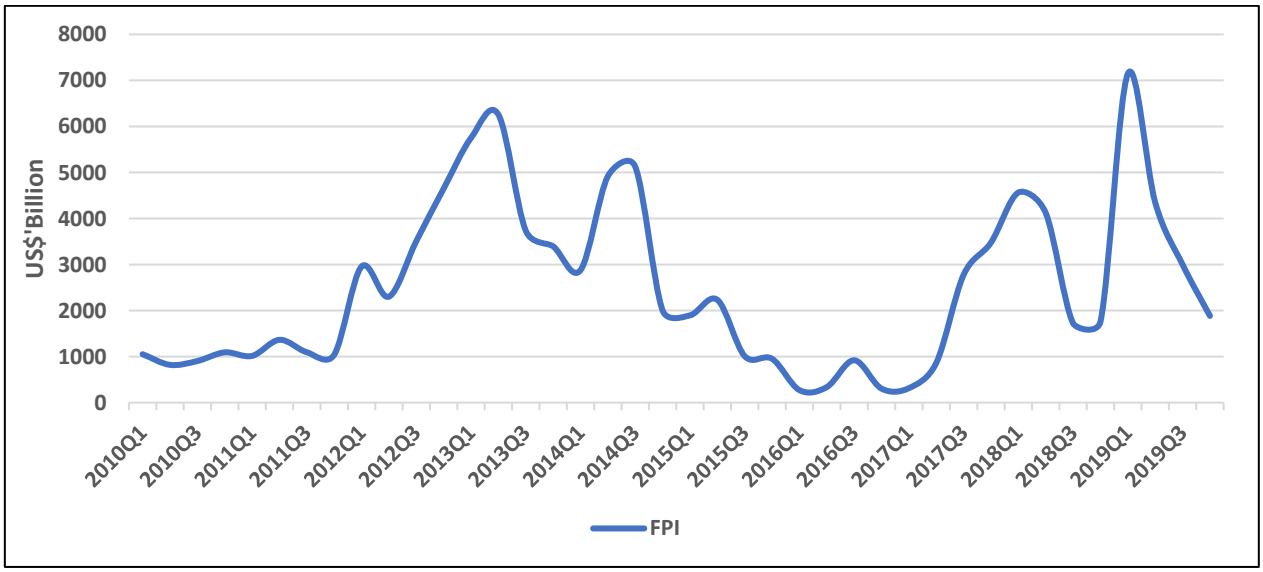
This fact is further amplified by other empirical evidence which has shown that periods of increase in oil prices leads to stable exchange rate of the domestic currency vis-à-vis the US dollar. These two factors are reliable reference points for investors to take position and decisions of capital placement or reversals as the case may be.

2.2. Nature or Investments in Nigeria

The nature of investments in Nigeria is majorly categorized as per the foreign direct and portfolio investments as well as the domestic direct and portfolio investment. The two major classifications are affected by the vagaries of both the external and domestic interplays.

2.2.1. Foreign Portfolio Investments

Nigeria being the largest economy in the African region, boast of a relatively deepened financial market compared to her peers in the region. Aside few countries in Africa, Nigeria remains the destination of most portfolio investments arriving in Africa. Part of the reason for the inflow of capitals into the Nigeria is its ability to sustain stable exchange which is derived from the country's external reserves position. A great percentage of investment in the Nigeria capital market is drawn from foreign portfolio flows – hence, whenever there is a shock on the Nigerian economy, investor scamper for safety in the advanced economies leading to huge capital flow reversal and fall in the stock market indices. As shown in figure 1 below, there are four major episodes of high inflow of foreign portfolio investments in Nigeria, the periods are between 2013Q2 & 2014Q3 and 2018Q2 and 2019Q1. Coincidentally, these periods correspond to the period when the exchange rate was relatively stable and the country witnessed significant growth in external reserves position.

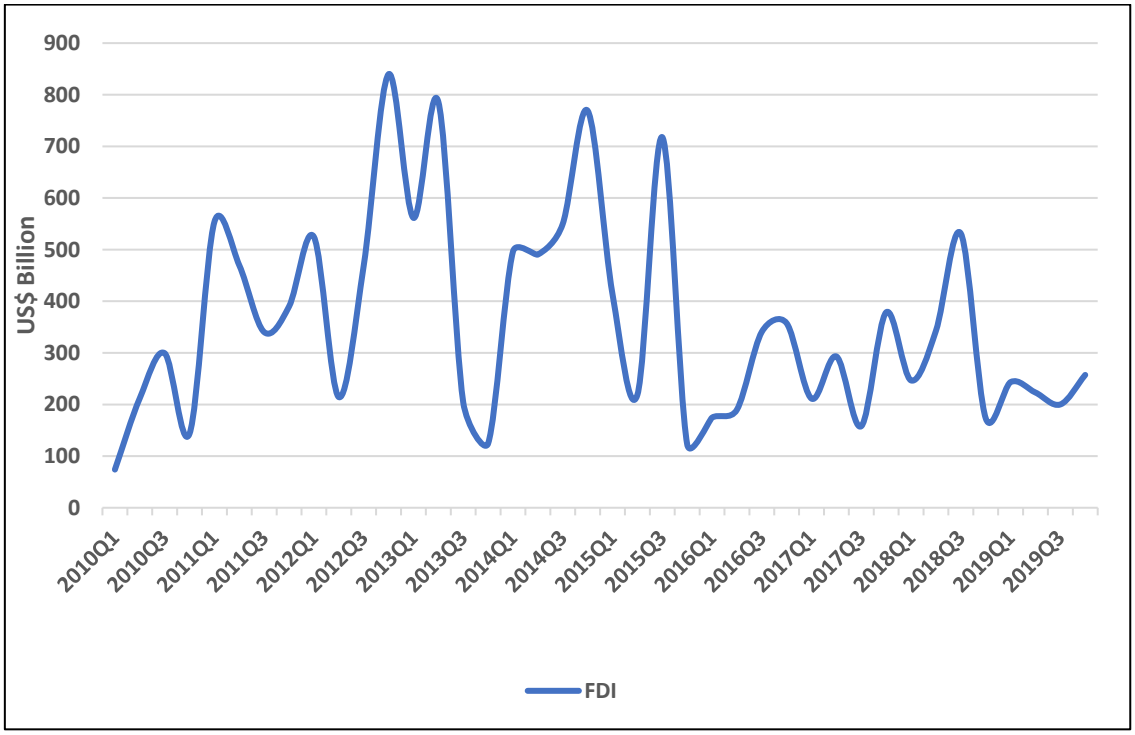


Source: CBN Statistical Database

Fig 1: Movement of Foreign Portfolio Investment in Nigeria

2.2.2. Foreign Direct Investments

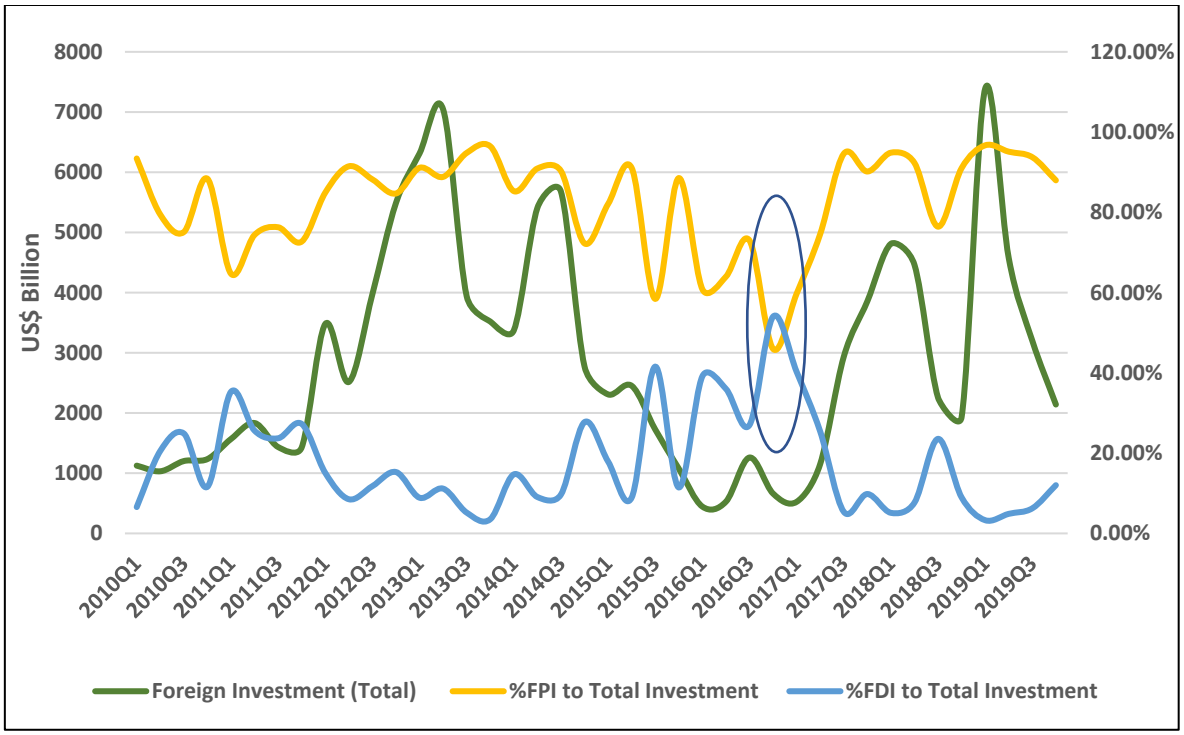
Converse to the high level of foreign portfolio inflow into the Nigerian economy, investors seeking for destinations of their capital haven't found the Nigerian economy very attractive to invest in the direct form. Foreign direct investment flows into Nigeria has been very volatile without any definable pattern albeit considerably lower than the foreign portfolio investment flows. According to the CBN, the average ratio of FDI to the total foreign investment in Nigeria stood at 17.62% between 2010 and 2019. This is mostly attributable to inadequate infrastructural development that will drive the smooth operation direct investment in the country.



Source: CBN Statistical Database

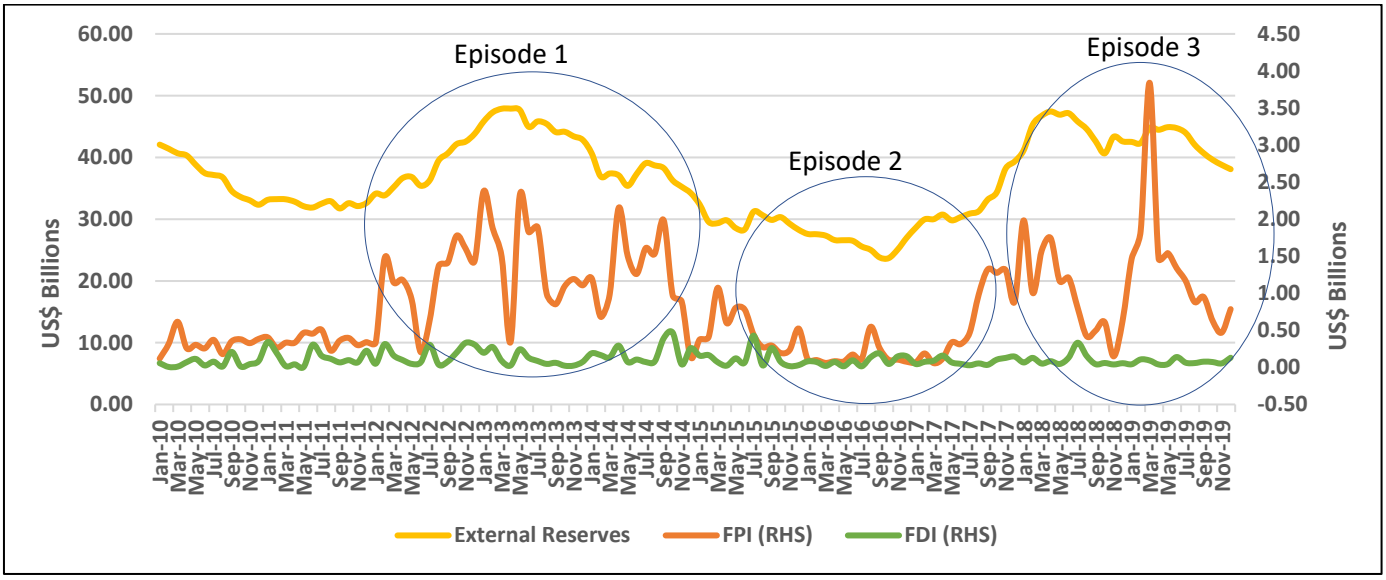
Fig 2: Movement of Foreign Direct Investment in Nigeria

Figure 3 below shows the percentage of both FDI and FPI to total foreign investmen inflows into the Nigerian economy. Evidently, it can be observed from figure 3 that foreign investment flows into the Nigerian economy is dominated by about 80 per cent of foreign portfolio investment between 2010 to 2019. A further look at the figure 4 shows three episodes where the direction of external reserves were similar to the foreign portfolio investment while the movement of the foreign direct investment did not exhibit any defined pattern in relation to the Nigeria's external reserves.



Source: CBN Statistical Database

Fig 3: Percentage of FDI and FPI to the Total Foreign Investments Flows

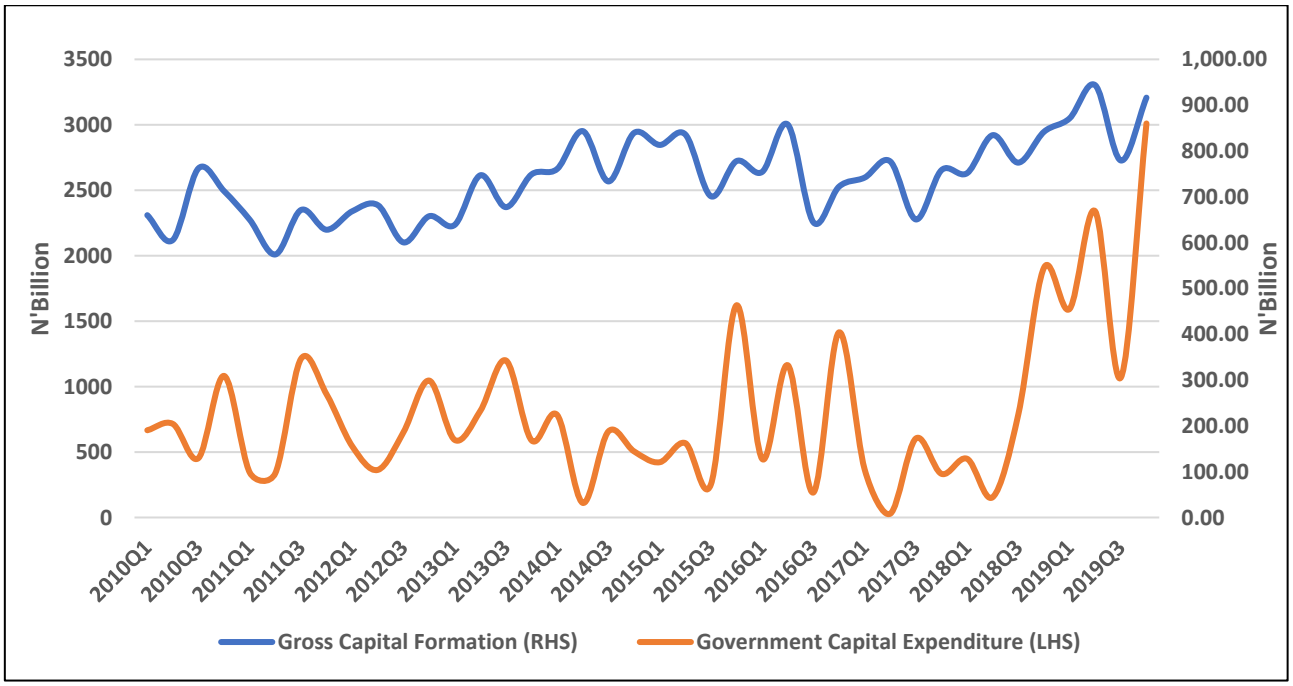


Source: CBN Statistical Database

Fig 4: Movement of External Reserves, FDI and FPI

2.2.3. Domestic Investments in Nigeria

Real domestic investment are expenses made to raise the total capital stock in the country. This is achieved by accumulating further capital-producing assets, in addition to assets generating incomes with the domestic economy – this is capture as the gross capital formation for an economy. The domestic investments in Nigeria is driven by government annual capital expenditure and the private investment. As an oil economy, the Nigeria government rely on receipts from oil sales to meet its budgetary obligation. Overtime, the annual budgetary provisions for capital has been below the required needs for capital goods in the country. The percentage capital expenditure vis-à-vis the recurrent expenditure have remained low at an average of below 30.0 per cent for last ten years. Government expenditure on capital projects improve the state infrastructure, enhance public goods, drive domestic investment and entrepreneurship, make the domestic economic environment favourable enough to attract foreign inflows and encourage export of goods and services which will increase external reserves accretion.



Source: CBN Statistical Database

Fig 5: Government Capital Expenditure and the Gross Capital Formation

In conclusion, it can be adduced that while the foreign portfolio investment has been a major source of capital inflows into the Nigerian economy with positive relationship with the external reserves, foreign direct investment has performed relatively abysmal. While acknowledging the importance of portfolio flows in stabilizing the domestic financial markets and building external reserves, its impact on destabilizing some domestic fundamental cannot be over emphasized and this is so because of its "hot moneyness" that allows foreign investors to repatriate their funds in an event of adverse macroeconomic fundamental in domestic economy. Furthermore, empirical researches have shown that

foreign direct investments provides more impetus for economic growth for developing countries than the portfolio counterpart. This fact is corroborated by figure 3 which shows the prevalence of FPI over FDI in the review period while figure 4 had present three episodes where the trend in portfolio investment reflects the movement of Nigeria's external reserves development.

3. Review of Related Literature Review

3.1. Theoretical Literature

From the literature, the interaction between foreign and domestic investment is of paramount importance and both can cause each other in an economy. The increase in private investment signals high return on investment in the domestic economy whereas public investment shows the improvement in infrastructure and thereby reduction in cost of doing business. These roles of domestic investment motivate the foreign investors to reap the benefits of high return. (Ndikumana and Verick, 2008) [14]. However foreign capital inflow may also be beneficial for the investors of host country. The impact of FDI on domestic investment is ambiguous; that is, FDI may have crowding-out or crowding-in impact on domestic investment. Crowding out impact of FDI means it is meaningless for FDI recipient country but crowding in impact of FDI on domestic investment is beneficial for the host country.

In this section, efforts are made to review a few theories on elasticity of substitution with a view to situate a case for the objective of this study. Some of the theories include the Armington Elasticity of Substitution, Allen Elasticity of Substitution and Morishima Elasticity of Substitution.

3.1.1. The Review of the Armington Elasticity of Substitution

Several authors have measured substitutability of one product or other as shown in the empirical literature. Most common amongst these works is the substitutability of domestic goods and foreign goods. Notable in the literature of elasticity of substitutability of goods at the international trade economics is the theory propounded by the Armington (1969). The Armington model is based on the principle that a given country produces a different good and that consumers would prefer to consume at least some of each country's goods. The assumption is completely ad hoc, and it ignores the "classical" trade arrangement such as increased specialization arising from comparative advantage.

Bruce and Wesley (1999) made effort to explain the Armington model of substitutability which typically follows the constant elasticity of substitution (CES) utility function, applied to determine the substitutability of domestic and foreign goods with an associated consumer optimization problem. The model derives a simple equation from the optimization problem that associates relative market shares of home and imported goods to the associated relative prices through an elasticity of substitution. Bruce and Wesley (1999) sought to explain the differences in these elasticities of substitution between the home and import good across industrial sectors. According to the authors, there are two general reasons to expect differing Armington elasticities of substitution across different sectors. First, the parameters of the underlying utility function in each sector may be different owing to differences in physical or perceived product differentiation. Second, there may be differences in the constraint facing consumers in different industrial sectors that may affect the degree of substitutability (e.g., protection). In general, the elasticity of substitution between two goods depends on the degree of product differentiation - consumers see goods as imperfect substitutes when there are obvious physical product differences.

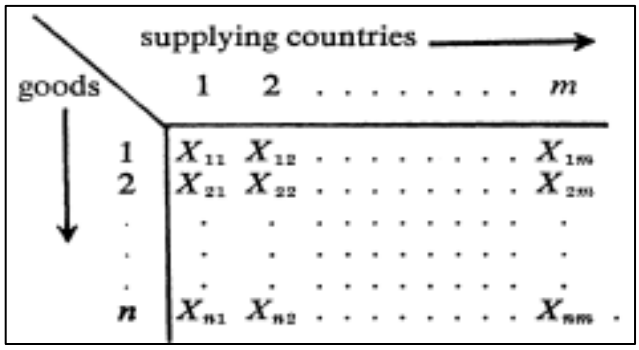
Basically, in an article on the theory of demand for products, distinguished by place of production, Armington (1969) used different dimensions which includes the geographic and commodity dimensions to build a model of substitutability between foreign and domestic goods. The theory specified the world economy in different geographical areas using $C = (C_1 C_2 \dots\dots\dots, C_m)$, and goods were represented as $X = (X_1 X_2 \dots\dots\dots, X_n)$. The model stipulates that the demand function is differentiated based on goods produced in different locations, countries or areas, that is $X_i = (X_{i1} X_{i2} \dots\dots\dots, X_{im})$, according to the Armington theory X_{ij} is meant to be an imperfect substitute for X_{ik} (j not equal to k), that is from the view point of buyers in any location, country or area C_i.

$$X = (X_{11} X_{12} \dots\dots\dots, X_{1m}, X_{21}, X_{22} \ldots\ldots, X_{2m} \ldots\ldots, X_{n1}, X_{n2}, \dots, X_{nm}) \quad (1)$$

$$\equiv (X_1, X_2, \ldots\ldots\ldots\ldots, X_n), where$$

$$X_i \equiv (X_{i1}, X_{i2}, \dots\dots, X_{im}), for\ i = 1,2 \dots\dots, n.$$

The model regarded the top line of this formulation is known as the product vector and can be represented in a matrix form as shown below.



With the use of matrix and differentiation, he finally arrived at a formula which he stated as

$$\frac{d(P_{IJ}X_{IJ}}{P_{IJ}X_{IJ}} = €_I \frac{dD}{D} - (\alpha_I - 1)\left(\frac{dP_{IJ}}{p_{ij}} - \frac{dP_I}{p_i}\right). \quad (2)$$

According to him, the bracketed ($\frac{dP_{IJ}}{P_{IJ}}$) is the direct price elasticity of demand for X_{IJ} while the bracketed coefficient of ($\frac{dP_{ik}}{P_{ik}}$) represents the cross elasticity of demand for X_{IJ}.

3.1.2. Neo-Classical Cobb-Douglas

Cobb-Duglas (1928) are of the view that output is a combination of labour and capital invested in it. The factor combinations of capital and labour, which is called the technological possibilities, was reformed from the solows model which was estimated as a production function:

Y= F (K, L)

Where: Y = Output; K= Capital; and L=Labour
The Cobb-Douglas was estimated from the solows model to become

$$y = k^a l^{1-a} \quad (1)$$

Which can be rewritten as

$$y = k^a \div l^a \quad (2)$$

Where: a = elasticities
The Cobb-Douglas equation is of the view that output depends directly on labour (L) and capital (C), and the other part is accounted by A which is called the residual or technical change. The Cobb-Douglas is therefore estimated as:

$$q = AL^a c^b \quad (3)$$

Where

$b = (1 - a)$ = elasticity

A= technical change or rate of technical progress
Since our study is on external reserve and the level of elasticity between domestic and foreign investment. Equation (3) could then be modified into:

$$ER = A.DI^a fi^b \quad (4)$$

Where
Er = External Reserve, DI= Domestic Investment, Fi= Foreign Investment, a = elasticities and b = $(1 - a)$ = elasticity

3.1.3. The Allen and Morishima Elasticity of Substitution
The concept of elasticity of substitution (Ω) as originally introduced by Hicks (1932) [11], made use of only two inputs (x_1 *and* x_2), and is thus defined as

$$\Omega = \frac{dln(X_2/X_1)}{dln(P_1/P_2)} \quad (1)$$

Where p is the price of inputs i. the elasticity of substitution provides a very important information in computing the relative responsiveness of inputs to changes in prices. Hicks (1932) [11] assumption is restricted to a production line with only two inputs required for production. His model cannot be applied to a situation where there are more than two inputs for production.
In a unique case of more than two inputs, a conventional measure of substitution is the Allen Partial Elasticity of Substitution (AES) developed by Allen (1938) [1]. From Chun and Hyunbae (2006), the AES between two inputs in a cost combination of α and β, for a 2 times differential cost function (C) is defined as

$$\Omega^A_{\alpha\beta} = \frac{C.C_{\alpha\beta}}{C_\alpha.C_\beta} \quad (2)$$

Where the subscripts denotes partial derivatives with respect to input prices. The inputs α and β are regarded as Allen substitutes if $\Omega^A_{\alpha\beta} > 0$ and allend complements if the inequality is reversed. Adopting Shepard's lemma, the Allen Elasticity of Substitution could be written as

$$\Omega^A_{\alpha\beta} = \frac{\varepsilon_{\alpha\beta}}{S_\beta} \quad (3)$$

Where $\varepsilon_{\alpha\beta}$ represents the cross-price elasticity (CPE) of demand for input α with respect to the price of input β, and S_β is the share cost of β. Equation (3) shows that the Allen Elasticity of Sustitution do not give further information concerning the pattern of input substitution relative to the cross-price elasticity. Additionally, equation (3) may suggest that the AES is not an appropriate measure of substitution, rather, Chun (2006) [9] added that an alternative measure of substitutability is the Morishima elasticity of substitution (MES), which is defined in form of a cost function as shown below.

$$\Omega^M_{\alpha\beta} = \frac{P_\beta C_{\alpha\beta}}{C_\alpha} - \frac{P_\beta C_{\beta\beta}}{C_\beta} \quad (4)$$

In determining the appropriate measure of substitutability, Blackorby and Russell (1989) [4] showed that the Morishima elasticity of substitution (MES) is a more appropriate measure of the degree of substitutability compared to the Allen Elasticity of Substitution, reason being that MES measure exact response of the ratio of input to change in price.
The Morishima Elasticity of Substitution in equation 4 is further expressed in terms of the cross- and own-price elasticities as shown below

$$\Omega^M_{\alpha\beta} = \varepsilon_{\alpha\beta} - \varepsilon_{\beta\beta} \quad (5)$$

Where $\varepsilon_{\beta\beta}$ indicates the own-price elasticity of input β. Therefore, the Morishima Elasticity of Substitution measures the percentage in the ratio of input α vis-à-vis input β, given that a one per cent change in the price of input β.
The Morishima Elasticity of Substitution is not symmetric, in contrast to the Allen Elasticity of Substitution, because changes in the input influenced by the price of input β are in contrast form those influenced by the price of input α. It is also worthy of note that the Allen complements ($\Omega^A_{\alpha\beta} < 0$) can be Morishima substitute ($\Omega^A_{\alpha\beta} > 0$), if $\varepsilon_{\alpha\beta} < 0$ and $|\varepsilon_{\alpha\beta}| < |\varepsilon_{\beta\beta}|$. On the other hand, the Allen substitutes are always Morishma substitutes. Therefore, the Morishima Elasticity of Substitution more regularly classifies two inputs as substitute than the Allen Elasticity of Substitution does.

3.2. Empirical Literature Review
In seeking to measure the elasticity of substitution between domestic and foreign goods, Bajzik *et al* adopted the Armington elasticity parameter which is a key approach in explaining the sensitivity of substitution between domestic and foreign goods in international trade. The study collected 3,524 reported estimates of the elasticity, to build 34 variables set that reflects the context and heterogeneity of the study. The study also accounted for inherent model uncertainties by employing the Bayesian and frequentist model averaging. The result of the study is divided into three different folds – firstly, there exist a bias against small and statistically insignificant elasticities. Secondly, the differences in the result was best explained by data differences, i.e frequency, aggregation dimension and size.

The third fold is that the mean elasticity implied by the literature after correcting for both publication bias and potential misspecifications is 3.

A study which aims to ascertain if the foreign investors crowd out or crowd in domestic investment in 30 Organization for Economic Co-operation and Development (OECD) countries with a coverage of 2006 to 2013, was conducted by Polat (2015) [18]. His work debunked some previous findings which indicated that the relationship between FDIs and domestic investments were mixed and controversial, arguing that some of the conflicting evidence is related to the ignorance of financing structure of FDI in the host country's market. The study employed the one-step Generalized Method of Moments system (GMMS) and was able to confirm that while the total foreign direct investment inflows do not have a significant effect on overall domestic investments in the countries studied, however, intra-country loans as a sub-component of the total FDI, do actually, possess a positive effect on the domestic capital formation in order words, domestic direct investment.

Wang (2019) [21] studied the interactions between the foreign exchange reserves of a country and foreign direct investment in order to explain the level of external reserves requirement for a small open economy of emerging market economies. In the model adopted, investment by domestic and international counterpart were put in the same picture. The result of the study indicates a positive co-movement between technology growth and current account. Further, it also suggested that high technological growth corresponds to net capital outflow, in that the outflow of the external reserves in attracting the inflows of foreign direct investment, thus providing a rationale to the `allocation puzzle' in cross-economy comparisons. The model also provides a positive co-movement between external reserves and foreign debt, thus supporting the debate on why economies borrow and save at the same time.

In a panel data related study on some selected African countries, Ijirshar *et al* (2019) [12] adopted the pooled mean group (PMG); dynamic panel models; and Mean Group (MG) to measure the growth-differential effects of Foreign Direct Investment (FDI) and Domestic Investment (DI) amongst forty one (41) selected African countries with data ranging from 1970 to 2017. The outcome of Hausman test indicated that the pooled mean group estimator is preferred. The study discovered that the foreign direct investment and the domestic were important ingredient for growth and development of African countries in the long-run. Their research work further discovered that foreign direct investment inflows crowd in domestic investment in Africa and there exist significant difference in the effect of growth of FDIs and domestic investments while the joint effect of the flows of the economic growth of African countries is not statistically significant. In the short-run, the result showed that FDI has a negative impact on growth of 24 countries in which four of them (Madagascar, Benin, Equatorial Guinea and Nigeria) exhibited a high significant level at 5%, while the estimated effect of the domestic investment on economic growth of Africa was positive. The paper concluded that FDI in Africa negatively impacts on growth of host countries in the short run, therefore, the study recommended that Governments in Africa should continually encourage investments and savings as one of the main sources of growth and only consider foreign direct investments as economic growth supplements.

Chhimwal and Bapat (2020) [8] applied the ARMA (1,1) and TGARCH (1,1) model to measure the impact of foreign and domestic investment in the stock market volatility of India. The authors investigated the effect of unexpected domestic institutional investments and foreign portfolio investment flow on the volatility of large capitalized, mid-capitalized and small-capitalized stocks for the Indian stock markets. The result of the study indicated that unexpected flows of foreign portfolio investments has a positive impact on the volatility of the market, but the magnitude of the impact is reduced by the unexpected flow of Domestic Institutional Investments. Additional result showed that the unexpected selling of FPIs increased volatility more than unexpected purchases. The study also showed that the impact of the unexpected flow of capital from domestic institutional investors dominated the small-capitalized stock.

Several authors have made efforts in assessing the determinants of external reserves accumulation in Nigeria and other countries of the world, this is in recognition of the important role that external reserves play in the macroeconomic stability of national economies. Specifically, external reserves accumulation enable countries to maintain competitively priced export, keep fixed rate value, remain liquid in case of crisis and provide investor confidence.

In assessing the determinants of external reserves in Nigeria, Irefin and Yaaba (2011) [10] adopted the Autoregressive Distributed Lag model to run a slightly modified econometric Buffer Stock Model as developed by Frenkel and Jovanovic (1981), however, with focus on the monetary policy rate, income exchange rate and import in Nigeria. The result of the estimation refuted the existence of buffer stock model for external reserves accumulation and provide a concrete evidence backing the notion that income is a major determinant or reserves holdings in Nigeria. In another attempt to modelling the determinants of external reserves in Nigeria, Osigwe *et al* (2015) [15], established a long run relationship of the macroeconomic variables adopted and the estimation result for short run coefficient indicated that based on parsimonious Error Correction Model (ECM), the real gross domestic product and oil exports were positive and significant in determining the level of external reserves, exchange rate was also significant but negatively signed determinant. Some other variables included in the study presented a mixed result in determining the external reserves in Nigeria. The study concluded by recommending that the government should incentivize the non-oil export as an avenue to positively affect the external reserves accumulation.

From the above empirical literatures, a lot of work have been done on the determinant external revenue in Nigeria. However, little or no effort have been made on ascertaining the elasticities of substitution between domestic and foreign investment for the purpose of external reserves build up. This work would attempt to fill this gap which obviously exist in the field of external reserves and more importantly on the elasticity of substitution between foreign direct investment and foreign portfolio investment.

4. Data and Methodology

The study made use of monthly time series data ranging from 2010M1 to 2019M12. Data for the study were obtained from the Central Bank of Nigeria Statistical Bulletins and Databases. The variables includes monthly external reserves (ER), foreign investments were disaggregated into foreign

portfolio investments (FPI) and foreign direct investments (FDI) and the gross capital formation (GCF) were used as proxy for domestic investment which includes both the private investment and government actual capital expenditure. Our preference for gross capital formation to represent the total domestic investment stems from the fact that the implementation government annual capital expenditure will filter down to private investments in the acquisition of assets such as equipment, tools and buildings, which makes up the gross capital expenditure. Furthermore, since the gross capital formation is the total investment in a country, both the FDI and FPI were deducted from the original data of gross capital formation in order to obtain a net position for domestic investment. The gross capital formation was initially obtained in quarterly form but was transformed into monthly data using an Eviews function for the purpose of uniformity with the other variables.

4.1. Model Specification

As we have mentioned in the empirical literature, a number of authors have made efforts in studying the elasticity of substitution amongst various variables. Most notable in the literature is Armington (1969). He investigated the elasticity of substitution between foreign and domestics goods. Iretin and Yaaba (2011) investigated the determinant of external reserves in Nigeria while, Osigwe *et al* (2015) [15] modelled the determinants of external reserves in Nigeria. Both authors relied on the Autoregressive Distributed Lag (ARDL) approach for their estimation. Our estimation will include an additional investigation to ascertain the elasticity of substitution between foreign and domestic investment on Nigeria's external reserves by further applying the Cobb-Douglas.

We sought to also adopt the ARDL cointegration technique as introduced by Pesaran and Shin (1999) [16] and Pesaran *et al*. (2001) [17]. One of the main advantages of the ARDL estimator is that it does not impose a restriction that all the variable in the series should have the same order of integration and its applicable irrespective of whether explanatory variable are I(0) or I(1) order of integration Pesaran and Pesaran (1997). Pesaran and Shin (1999) [16] also indicated that the ARDL estimator produces the true coefficients as compared to the Johansen and Juselius's cointegration method, furthermore, the endogeneity is less a problem in ARDL framework because it is free of residual correlation. Pesaran and Shin (1999) [16] showed that the ARDL method can distinguish between dependent and explanatory variables and the estimation is possible even when the explanatory variables are endogenous.

In our model, we selected some variables that the external reserves could respond to their individual changes in line with apriori expectations. Thus, we propose that the variables are combined to form a functional equation as stated below:

The paper would adopt the cobb-douglas theory because it deals with factor of production which investment is also a part of production.

Therefore, Equation (4) which was modified from the cobb-douglas equation could be converted into a natural log form, which makes it

$$lER = lA + aLDI + bLFI \quad (5)$$

Equation (5) can be converted to a linear form

$$ER = A + aDI + bfi \quad (6)$$

$$ER = f(FDI, FPI, GCFN) \quad (7)$$

Where:
ER = Nigeria's External Reserves
FDI = Foreign Direct Investment
FPI = Foreign Portfolio Investment
GCFN = Gross Capital Formation

The estimable function is derived from equation (1) and expressed as:

$$ER_t = \alpha_0 + \alpha_1 LFDI_t + \alpha_2 LFPI_t + \alpha_3 LGCFN_t + \varepsilon_t \ (2)$$

The equation 2 above represents the long-run equilibrium relationship amongst the variables and the coefficients explains the elasticity of the variables with respect to external reserves.

4.2. Autoregressive Distributed Lag (ARDL) Methodology

The paper adopted the Autoregressive Distributive Lag (ARDL) bounds test following the characteristics of the variables as stipulated by Pesaran, Shin and Smith (2001) [17] on equation (2) to measure the presence of cointegration – long run relationship of the variables. The Autoregressive Distributive Lag specification of equation (2) is thus shown as follows

$$\Delta LER_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta LER_{t-1} + + \sum_{i=0}^{n} \alpha_{2i} \Delta\, LFDI_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta\, LFPI_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta\, LGCFN_{t-i} + \beta_1 LER_{t-1} + \beta_2 LFDI_{t-1} + \beta_3 LFPI_{t-1} + \beta_4 LGCFN_{t-1} + \varepsilon_t \ (3)$$

Where α_0 represents the intercept, $\alpha_1 - \alpha_4$ explains the short run dynamics coefficients, while $\beta_1 - \beta_4$ represent the long run multiplier. The error term is represented by the ε_t. The equation is estimated with the logged form of the variables.

The ARDL model testing procedure starts with conducting the bounds test for the null hypothesis of no cointegration. The calculated statistics are compared with the critical value tabulated by Pesaran *et al*. (2001) [17]. If the test statistic exceeds the upper critical value, the null hypothesis of no long-run relationship can be rejected regardless of whether the underlying orders of integration of the variables are I(0) or I(1). Similarly, if the test statistic falls below the lower critical value, the null hypothesis is not rejected. However, if the sample test statistic falls between these two bounds, the result is inconclusive. The model can be selected using the lag length criteria like Schwartz-Bayesian Criteria (SBC) and Hannan-Quinn (HQ) information criterion.

Having established the long-run cointegration, the error correction model is estimated in order to obtain the short run dynamics and parameter adjustment of the long run. The specification below indicates the error correction model:

$$\Delta LER_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta LER_{t-1} + \sum_{i=0}^{n} \alpha_{2i} \Delta LFDI_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta LFPI_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta LGCFN_{t-i} + \emptyset ECM_{t-1} + \varepsilon_t \quad (4)$$

Where:
Δ denotes the first difference operator
α_0 represents the intercept
α_0 - α_4 are short run dynamic coefficients of the model
θ is the rate of adjustment to equilibrium.

Table 1: The A Priori Expectations of the Variables Used in the Model

S/N	Variables	Variables Notations	Measurements	A priori Expectation
1	External Reserves	ER	US$ Billion	+ve
4	Foreign Direct Investment	FDI	US$ Billion	+ve
5	Foreign Portfolio Investment	FPI	US$ Billion	+ve
6	Gross Capital Formation	GCFN	N'Billion	+ve

Source: Authors Compilation

All the variables in the model are expected to have a positive relationship with the level of external reserves. Government capital expenditure is expected to improve investment domestic infrastructure, boost the ease of doing business in the country and attract foreign capital inflows in the economy which will lead to external reserves accretion. Foreign direct investment (FDI) are investments made firms or individuals into a business interest located in another country. Therefore, such investments are expected to have a positive relationship with the receiving country's external reserves position. However, evidence from Ugwu and Okoye (2018) [20] showed that FDI inflows into the Nigerian economy do not have a positive relationship with external reserves. Furthermore, foreign portfolio investment which stands for capital investments in government and privates securities are major sources of reserves accumulation in most emerging and developing economies is also expected to exhibit a positive relationship with the external reserves. The gross capital formation prescribes the additions to fixed assets, plus the net change in inventories which are additions in plants, machinery, equipment and buildings. The accumulation of gross capital formation is expected to have a positive relationship with the external reserves in Nigeria.

4.3. Results and Discussion

4.3.1. Graphical Presentation of Data

As it is customary in most time series econometric analysis, the first step is to analyze the statistical properties and characteristics of the data especially as it relates to trend, direction of trend, existence of structural breaks and stationarity. The natural log form of the variables used in model are presented in Figure 6 below. The figure shows that log of gross capital formation (LGCF) exhibits a linear distinct upward and deterministic trend in pattern, while the logs foreign direct investment (FDI), foreign portfolio investment (FPI), and external reserve (LER) did not exhibit any deterministic trend. No distinct structural breaks were identified in the graphical presentation except two episodes of downward-like structural breaks observed in the external reserves (LER).

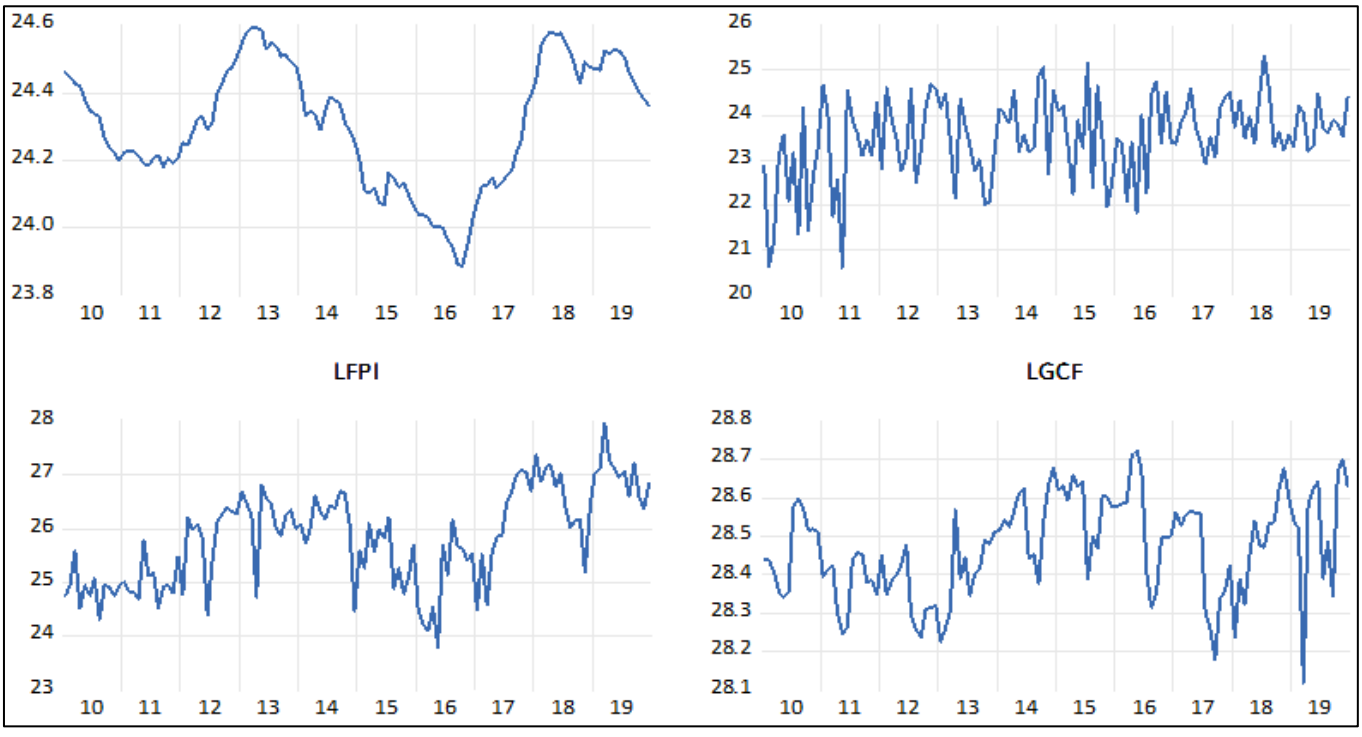


Fig 7: Graphical presentation of the variables included in the ARDL Model

Table 2: Some Descriptive Statistics

	LER	LFDI	LFPI	LGCF
Mean	24.30610	23.50121	25.82488	28.46978
Median	24.32646	23.51499	25.97390	28.47902
Maximum	24.59245	25.34668	27.96213	28.72201
Minimum	23.88831	20.61086	23.80214	28.11857
Std. Dev.	0.183501	0.935898	0.881968	0.129979
Skewness	-0.260466	-0.728776	-0.096921	-0.228765
Kurtosis	2.079068	3.539826	2.140435	2.346283
Jarque-Bera	5.597430	12.07935	3.882132	3.183396
Probability	0.060888	0.002382	0.143551	0.203580
Sum	2916.732	2820.146	3098.986	3416.374
Sum Sq. Dev.	4.007033	104.2327	92.56614	2.010458
Observations	120	120	120	120

The descriptive statistics shows that External reserve, foreign direct investment, foreign portfolio investment and gross capital formation has a mean value of $24.31 billion, $23.50 billion, $25.82 billion and $28.47 billion, while the median of the descriptive statistics shows that External reserve, has a value of $24.33 billion, foreign direct investment has a value of $23.51 billion, foreign portfolio investment has a value of $25.97 billion and gross capital formation has a value of $28.48 billion. The variable with the highest maximum value is gross capital formation, followed by foreign portfolio investment, then foreign direct investment and the variable with the least maximum value is exchange rate. The table shows that foreign direct investment has the least minimum value, followed by foreign portfolio investment, then gross capital formation and then exchange rate. The table also shows that all the variables are negatively skewed, the kurtosis reviewed that foreign direct investment has the highest value, followed by gross capital formation, foreign portfolio investment and then exchange rate.

4.3.2. Unit Roots Tests

The Augmented Dickey Fuller (ADF) and the Philip Peron (PP) tests statistics with both intercept and trend, were used for establishing the existence or otherwise of unit roots. We compared the 't' values with the Mackinnon critical values to reject or not, the hypothesis that a unit root exists. The variables chosen indicated statistical significance ranging from 1 to 5 per cent critical values. The tests results are shown in Table 2. The hypothesis is formulated thus:

Ho: $\theta = 1 - 5$ (Non-stationary)

H1: $\theta < 1 - 5$ (stationary)

Table 3: Result of the Unit Root Test for Stationarity

	ADF			Phillip Perron		
Variables	**Level**	**1st Diff**	**Order of Integration**	**Level**	**1st Diff**	**Order of Integration**
LER	1.6995	-7.2296*	I(1)	-1.8238	-7.5206*	I(1)
LFPI	-2.6662	-17.508*	I(1)	-4.0649**	-	I(0)
LFDI	-9.0492*	-	I(0)	-9.1257*	-	I(0)
LGCFN	-3.0752**	-	I(0)	-5.0962*	-	I(0)

Authors' Compilation NB: *, ** and *** Indicates statistical significance @ 1%, 5% and 10%

4.3.3. Bounds Cointegration Test

The study adopted the ARDL Bound test to measure whether the variables exhibit a cointegrating relationship amongst the investment variables that determines the level of external reserves. Having established the order of integration, a long run relationship between the variables were tested using the bounds test. The cointegrating test was also ascertained using the ARDL model.

The variables include the logged forms of external reserves, foreign portfolio investment, foreign direct investment and gross capital formation. From table 4 below, the result of the bounds test indicates solid evidence of a long-run relationship between the variables compared with the critical values prescribed by Pesaran *et al* (2001) [17] at the lower and upper bounds. The F-statistics at 5.0 per cent level of significance appeared to be greater than both the lower and upper bounds critical value. We therefore conclude that there exists long-run relationship between external reserves and its determinant as provided the model stated earlier. Subsequent upon the foregoing, our equation is estimated using the ARDL co-integration technique for long run estimates.

Table 4: Result of the Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.355645	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Authors' Compilation

4.3.4. Long-Run Regression Estimates Results

From the result of the ARDL estimation presented in Table 5, the coefficient of gross capital formation possesses a negative sign (-1.2974) contrary to apriori expectation, however, this was statistically significant at 0.0016. This implies that government capital expenditure during the review period does not contribute to growth of Nigeria external reserves. This could also be explained by the dearth of infrastructure and inadequate public goods which is believed to be a major source confidence and attraction for both domestic and foreign investment especially for an

emerging and developing economy like Nigeria. Additionally, given that the Nigerian economy is a public sect driven economy which relies on the monthly Federal Account Allocation Committee (FAAC) distribution to fund expenditure on capital goods (feeding into the gross capital formation). Government capital expenditure in the last two decades, have remained below 30.0 per cent of the total annual budget even when evidence suggest the need for an improved capital expenditure to boost growth and development.

The long run ARDL result presented in table 5 revealed that the coefficient of FPI returned positive as predicted by the a priori at 0.168054 and was statistically significant at 0.0001, implying that a 1.0 per cent increase in foreign portfolio investment will lead to the accretion of external reserves to the tune of 0.17 per cent. The result is in line with the trend shown in Figure 4 in the stylized fact area where the time series data on FPI and external reserves were observed to move in the same direction. Additionally, foreign direct investment (FDI) does not contribute the accretion to the external. Even though a priori expectation indicated that foreign direct invest should lead to accumulation of reserves, the result in table 5 indicated that coefficient of FDI is negatively signed (-0.027986) contrary to a priori expectation, and was statistically insignificant at 0.4480, further indicating that there is no long run relationship between FDI inflows and the external reserves during the period under review. It can be adduced from this result that the dearth of domestic infrastructural development coupled and incoherent government policies are hampering the investor confidence to invest in the Nigerian economy. On the other hand, the foreign portfolio investment as presented in table 5 below exhibited a right sign and statistically significant.

Table 5: Estimated Long-Run Coefficients ARDL (4,3,1,0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGCF	-1.297398	0.399807	-3.245059	0.0016
LFPI	0.168054	0.040312	4.168878	0.0001
LFDI	-0.027986	0.036748	-0.761566	0.4480
C	57.54859	11.45796	5.022584	0.0000
Dependent Variable: LER Selected Model: ARDL (4,3,1,0)				

Author's Computation

Meanwhile the F-statistic figure in the bounds test reflects the long-run relationship among variables based on whether it is greater or lower that the threshold. The result in Table 4 shows that the F-Statistics (5.36) is greater than the lower and upper bounds showing the overall significance of the model in both short and the long-run and indicating a long-run relationship among the variables even at 5% level.

4.3.5. ARDL Error Correction Regression

Estimating the error correction model (ECM) enabled us to obtain the short run dynamics associated with the long-run estimates. The Error Correction regression result presented in table 6 indicated the coefficient of the ECM is -0.096. the result showed the appropriate sign and its statically significant at 1.0 per cent. The condition for error correction model is that the coefficient of the cointegration equation must be negative signed and this represents the speed of adjust from its initial level of disequilibrium to a long–term equilibrium path. This shows that the disequilibrium of external reserves coming from shock in the preceding month, would be corrected by 9.6 per cent in the following month in other to attain equilibrium level in the long-run. In our model, most the variables were statistically significant, and the coefficient of the variables were rightly signed except whose lag form depicted the wrong signs but was significant.

Table 6: ARDL Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LER(-1))	0.225630	0.085976	2.624332	0.0100
D(LER(-2))	-0.070634	0.088155	-0.801239	0.4248
D(LER(-3))	0.198693	0.083172	2.388948	0.0187
D(LGCF)	-0.085961	0.029957	-2.869443	0.0050
D(LGCF(-1))	0.107241	0.032092	3.341700	0.0012
D(LGCF(-2))	0.047265	0.030350	1.557327	0.1224
D(LFPI)	0.007919	0.005258	1.505946	0.1351
CointEq(-1)*	-0.096464	0.018293	-5.273344	0.0000

Source: Authors' Compilation

4.3.6. Diagnostic Test for the Model

The diagnostic test for possible presence of serial correlation and heteroskedasticity in the model is presented in table 7. The null hypothesis of these test in the model is that there is heteroskedasticity and serial correlation are present. The result of the serial correlation indicates the rejection of the null hypothesis given that the p-value of the f-statistics of Breusch Godfrey test as well as the test for heteroskedasticity using the Breusch Pagan test are greater than 0.05 level of significance. Thus, the specification of the model is free from heteroskedasticity and serial correlation. Furthermore, the model was tested for misspecification using Ramsey RESET test as shown in table 8. The Ramsey Reset test shows that for all test statistics at 0.05 level of significance, the null hypothesis of no misspecification error is accepted. Therefore, the model used in this study is well specified.

Table 7: Serial Correlation and Heteroskedasticity Diagnostics Test

	F-statistic (p-value)	Obs*R-squared Prob. Chi-square)
Serial Correlation Test	0.563416 (0.5710)	1.267493 (0.5306)
Heteroskedasticity Test	1.033016 (0.4232)	11.42591 (0.4083)

Author's Compilation

Table 8: Ramsey Reset Test

	Value	df	Probability
t-statistic	0.739835	103	0.4611
F-statistic	0.547356	(1, 103)	0.4611
Likelihood ratio	0.614808	1	0.4330

Author's Compilation

Additional test for stability was conducted using the CUSUM and CUSUMSQ as developed by Brown *et al* (1975) [5]. This was in order to incorporate the short-run dynamics for consistency of long-run parameters, the stability of the long-run coefficients was used for error term correction. Figure 2 and 3 shows the plot of CUSUM and CUSUMSQ which indicates that the statistics lie within the 5.0 per cent critical bounds further emphasizing that the coefficient of the model is stable.

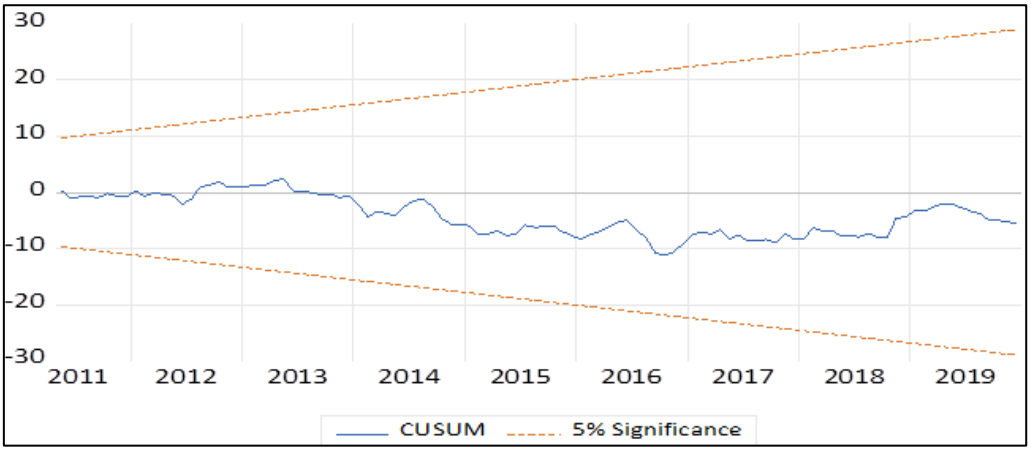


Fig 2: Plot of CUSUM

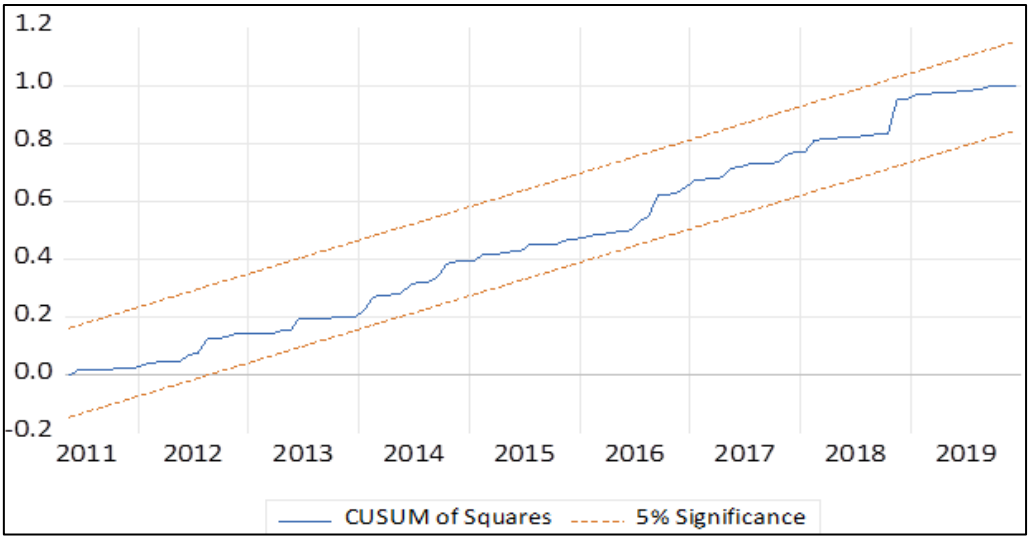


Fig 2: Plot of CUSUMSQ

4.3.7. Application of Elasticity of Substitution

To determine the elasticity of substitution between the domestic and foreign investments in Nigeria, the cobb-douglas, as reviewed in section three (theoretical literature review) was applied on the result of the ARDL estimation. Given the foregoing, the gross capital formation as a proxy for domestic investment is the numerator, while the foreign investments (direct and portfolio) were the denominators. On the other hand, to determine the converse of the elasticities, the inverse of the former was computed.

From table 9, the elasticity of substitution between foreign portfolio investment and gross capital formation (domestic investment) is inelastic at -1,1293, implying that the level of external reserves will be negatively affected if a pursue a policy to substitute GCF with FPI. An elasticity of substitution of FPI with GCF also resulted to an inelastic position but with a higher degree of responsiveness at -7.7201. In both scenarios, the response of external reserves when substituting either FPI for GCF or GCF for FPI will result to inelastic position (Negatively affect the external reserves).

The elasticity of substitution between GCF and FDI is elastic and the degree of external reserves responsiveness is 46.35, implying that if the government pursue a policy to promote domestic investment over foreign direct investment, it will lead to massive improvement in the level of external reserves accretion. Lastly, the elasticity of substitution between FDI and GCF i.e. substituting domestic investment with foreign direct investment is perfectly inelastic at 0.02, implying that the external reserves is constant and remains insensitive to the substitution effect between FDI and GCF.

Table 9: Level of substitution of elasticity

Variables	Coefficients	Level of elasticity	Remark
$\frac{LFPI}{LGCF}$	$0.168054/-1.297398$	-1.1293	Inelastic
$\frac{LGCF}{LFPI}$	$-1.297398/0.168054$	-7.7201	Inelastic
$\frac{LGCF}{LFDI}$	$-1.297398/-0.027986$	46.3588	Elastic
$\frac{LFDI}{LGCF}$	$-0.027986/-1.297398$	0.0215	Perfectly inelastic

Authors Compilation

5. Conclusion and Recommendation

The paper focused on assessing the elasticity of substitution between domestics and foreign investment in Nigeria. Due to the dearth of monthly data required for this study stemming

from the rebasing of the Nigeria economy in 2010, we were able to obtain and use monthly data from 2010 to 2019. The objective of the study is premised on the fact that most emerging and developing economies focus more on foreign capital flow in order to build external reserves for purpose of external sector balancing. However, some school of thought advocates that domestic investment will propel domestic production and minimize reliance on foreign products, with strong possibility of increasing exportation for foreign exchange earnings and preservation of external reserves. In addition, the elasticity of substitution should signal where appropriate responses should be focused on and the soundness of monetary policy decisions. This is important in view of the implications of investment behavior for external reserves sustainability. In our view, the knowledge of the dynamics and differential effects of domestic or foreign investment could be sufficiently strong in swinging policy towards supporting measures that aim to protect domestic investors against competition from their foreign investments and their perverse effects like lowering the returns to domestic investments.

In order to achieve the objective of how Nigeria's external reserves responds to changes in the domestic and foreign investment behavior, we first estimated a model for external reserves using the autoregressive distributed lag before applying the coefficient on the Slustsky equation for the determination of elasticity of substitution between foreign and domestic investments in Nigeria. The study employed ARDL (Bounds Test) to establish the relationships and interactions among the variables of interest namely; the external reserves, domestic investment proxied by the gross capital formation, the foreign investment was disaggregated to foreign portfolio and foreign direct investments. The analysis of the stylized facts reveals that while the foreign portfolio investment has consistently contributed more than 80.0 per cent of the total foreign investments into the Nigerian economy, the foreign direct investment has not been favourably flowing into the economy during the review period. This development is understandable given the evidence also from the stylized fact which showed that government capital expenditure over the review period have been gross inadequate to fill the infrastructural gap required to at least attract direct investments in the domestic economy. The stylized fact also showed the existence of a direct relationship between the external reserves accretion and the foreign portfolio flows while, the foreign direct investment data did not exhibit any particular relationship with the external reserves.

From the ARDL analysis employed for determination of the variables' significance, the long-run coefficient of foreign portfolio investment is positive and significance, implying that policy that encourage the flow of FPI into the Nigerian economy could result to substantial increase in the accretion to external reserves in the long run. On the contrary, the foreign direct investment flows which has been very low into the country was negative and statistically insignificant. This is not unconnected to inadequate investment of capital goods in the domestic economy to drive productive activity. The coefficient of the gross capital formation was negative contrary to expectations even though it was statistically significant at 5.00 per cent. This implies the need to promote domestic investment in the economy as this portends a great opportunity to boost domestic production that will serve as substitutes/replacements for imported goods and create opportunity for the production of exportable goods that improve external reserves position. Also from the result, the ARDL Error Correction term showed that the ECM of 9.6464 per cent and was highly significant at 1.0 per cent. Furthermore, this implies that if there any shock on the external reserves, the speed of adjustment for the dependent will be 9.4 months, following the computation ((1/IÕI) – 1) of speed of adjustment as derived from Sanusi (2016) [19]. Where IÕI is the coefficient of the cointegrating equation of the error correction model.

The result of the elasticity of substitution measured with the cobb-Douglas equation showed that substituting either domestic investment for foreign portfolio investment or foreign portfolio investment for domestic investment will result to inelastic external reserves position. This implies that the degree of responsiveness of external reserves given the two scenarios is negative and policies to promote these forms of substitution should be pursued. Again, the elasticity of substitution between foreign direct investment and domestic investment leaves the external reserves constant – in line with the coefficient of the long-run model which indicates that foreign direct investment is negatively signed and statistically insignificant. However, the result should show that the elasticity between domestic investment and foreign direct investment is highly elastic at 46.36, implying that focusing on domestic investment will promote the accumulation of external reserves due to the export proceeds that will arise from production of exportable goods and services.

Some of our recommendations derive from this study includes the need for government to focus of domestic investment by expanding its revenue sources in order to allocate more resources for annual capital expenditure. The government should also embark on building capital goods to encourage domestic private investment the production of goods and services suitable to replace imported ones and provide opportunity for export of such goods and services. The result of the study indicated that foreign direct investment is negatively sign contrary to a priori expectation, the FDI was also statistically insignificant both at the long-run and the error correction term, considering the potential benefits that FDI portends if its flows into the Nigerian economy is considerably high like the foreign portfolio investment, the Federal Government should embark on massive investment of business-promoting infrastructural facilities in order attract more FDIs into the country. Furthermore, monetary policy should focus on credit creation in order to promote private sector investment in production of goods and services to preserve and build external reserve.

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