

FOREIGN DIRECT INVESTMENT AND CAPITAL FORMATION: POLICY IMPLICATIONS TOWARDS ACHIEVING PRO-POOR GROWTH IN NIGERIA

OLUKEMI OLUMUYIWA OLOWE

Department of Economics, McPherson University, Seriki-Sotayo, Nigeria

E-mail: oloweoo@mcu.edu.ng; +2348055300289

ABSTRACT

This study examines the links between foreign direct investment (FDI) and capital formation in Nigeria within the period of 1981-2020. The estimation approaches used are augmented Dickey Fuller test for stationarity level of our data sets and the autoregressive distributed lag (ARDL) model for short- and long- run relationship between the FDI and capital formation. The unit root test result indicated that interest rate and inflation rate were stationary at levels while other variables - FDI, government expenditure, gross domestic product, exchange rate and capital formation were reported to be stationary at first difference. Using the autoregressive distributed lag model, it confirmed that there is a long-run relationship between FDI and capital formation in Nigeria. The results further show FDI has positive and significant impact on capital formation in Nigeria. Other factors that positively influenced capital formation are government expenditure, gross domestic product and interest rate. However, exchange rate and inflation rate have negative impact on private investment in Nigeria. The study suggests the need for government to continue attracting foreign investment as it stimulates the capital formation channel towards enhancing output growth that is capable of promoting poor. Also, the financial sector most especially the apex bank, should ensure proper mobilization of investible fund in the economy through high saving deposit rates and accessibility of such fund by private investors through low lending rate.

Keywords: FDI inflows, capital formation, government spending, and income.

JEL Classification: E22, F21, H54, O16.

1. INTRODUCTION

Over the past decades, one of the major objectives of every economy is to achieve a rapid economic growth and development that is able to reduce poverty, creation of employment opportunities and the entire promotion of the welfare of the citizenry. Virtually, almost all development theories believe that this economic growth can be achieved through the accumulation of physical and human capital among other things. Hence, the accumulation of capital can come in the form of Foreign Direct Investment (FDI) and domestic investment which are the central issues on which this research work revolves (Okoli and Agwu, 2015; Alimi and Alese, 2017; Contractor *et al.*, 2020; Joghee, Alzoubi, and Dubey, 2020).

Nigeria as one of the developing countries of the world, has adopted a number of measures aimed at accelerating growth and development in the domestic economy, one of which is to attract foreign direct investment (FDI). Ugwuegbe *et al* (2012) and Adebayo and Gambiyo (2020) noted that the underdeveloped nature of the Nigerian economy that essentially hindered the pace of her economic development has necessitated the demand for Foreign Direct Investment into the country. This is in line with the understanding that FDI contributes positively to the growth of domestic economy. Khan (2007) asserts that FDI has emerged as the most important source of external resource flows to developing countries over the years and has become a significant part of capital formation in these countries, though their share in the global distribution of FDI continued to remain small or even declining. The role of FDI has been widely recognized as a growth-enhancing factor in the developing countries.

Many researchers have looked at the impact of FDI on the growth of Nigerian economy (Aremu, 1997; Adelegan, 2000; Otepolo, 2002; Bello, 2003; Akinlo, 2004; Umah, 2007; Shiro, 2009) with mixed findings arising from different studies on different time periods as well as different methodologies. However, not many of these studies have actually taken a closer look at the long run relationship that exists between FDI

and capital formation in Nigeria. Nonetheless, capital formation has been an important channel through which FDI has employed to enhance the economic growth of developing economies. The only attempt to consider this is the study of Orji and Mba (2011) that employed Cobb–Douglas production function in determining the long run relationship between FDI, capital formation and economic growth in Nigeria. Although, they found that there is a long run relationship between FDI, capital formation and economic growth, but the focus is not on factor enhancing capital formation most especially through foreign direct investment.

Nigeria is one of the few countries that have benefited from the FDI inflow to Africa. According to the Central Bank of Nigeria (CBN, 2004), Nigeria's share of FDI inflow to Africa averaged around 10%, from 24.19% in 1990 to a low level of 5.88% in 2001 up to 11.65% in 2002. United Nations Conference on Trade and Development (UNCTAD, 2004) showed Nigeria as the continent's second top FDI recipient after Angola in 2001 and 2002. The nominal FDI inflow ranged from US\$205 million in 1970 to US\$587.88 million in 1990, US\$1,140.17 million in 2010, and US\$8,841.11 million in 2011 (World Bank, 2018). The net inflow of FDI has reduced drastically in the succeeding years. For instance, the nominal values are US\$7,069.93 million, US\$4,651.47 million, US\$4,445.10 million and US\$3,497.23 million in 2012, 2014, 2016 and 2017 respectively. However, FDI forms a small percentage of the nation's gross domestic product (GDP), however, making up 1.637% in 1970, -1.15% in 1980, 10.83% in 1990, 3.17% in 2002, 1.53% in 2012 and 0.93% in 2017 (World Bank, 2018).

This study therefore investigates the link between foreign direct investment and capital formation in Nigeria within the periods of 1981 to 2020. The focus of this study is to aid policy formulation towards attracting adequate foreign direct investment for the country. The ARDL bounds testing approach was employed for this study because of the small sample which span between 1981 and 2020. The estimation approach is found to be more efficient for studies with small and limited sample sizes, and also applicable where the control variables are endogenous (Pesaran *et al.*, 2001; Haug, 2002; Narayan and Smyth, 2005; Alimi, Yinusa and Ilo, 2016; Alimi, 2017; Maku and Alimi, 2018). Further, it is an improvement over previous studies that relied on the residual-based cointegration test connected with work by Engle and Granger (1987) and the maximum likelihood test linked with Johansen and Juselius (1990). Salient research questions this study addressed are: Is there any kind of relationship between FDI and capital formation? To what extent did FDI influence capital formation both in short- and long- run?

Other parts of the study are divided into four sections. Section two reviews the existing theoretical and empirical literature. Section three covers methodology, data description and sources. Section four presents discussion of the findings while section five concludes and proffers proper policy recommendation.

2. LITERATURE REVIEW

2.1 Conceptual Literature

According to Ghirmay and Cadet (1998) Foreign direct investment (FDI) refers to the ownership of assets in a foreign country. It occurs in two ways. One involves the acquisition of domestic firms by foreign investors, including the purchase of stocks in domestic corporations in which the foreign investor has significant equity. The other method of foreign direct investment is the construction of new production facilities in the foreign country - either brand-new subsidiaries or expansion of existing subsidiaries. Foreign direct investment involves not only a transfer of resources but also the acquisition of control. In most cases, the subsidiaries not only have a financial obligation to the parent company, but it is part of the same organizational structure. World Bank (1996) looked at FDI as an investment made to acquire a lasting management interest (normally 10% of voting stock) in a firm or an enterprise operating in a country other than that of the investor defined according to residency. However, Foreign Direct Investment (FDI) is often seen as an important catalyst for economic growth in the developing countries because it affects the economic growth by stimulating domestic investment, increase in capital formation and by facilitating the

technology transfer in the host countries (Falki 2009). Multinational corporations are the major players in foreign direct investment. They often establish new businesses in foreign countries or provide the foreign subsidiaries with capital, in the expectation of creating a profitable integration of their operations. Many factors determine multinational corporations' decision about where to locate foreign subsidiaries or undertake significant foreign direct investment. Ghirmay and Cadet (1998) identified these key factors responsible for the location of foreign subsidiaries to include low unit labor costs, adequate economic infrastructure, large domestic markets, and government regulations, and political instability in the host country. Most big corporations now have foreign subsidiaries supplying components to the parent company or producing the same good or service. And this has led to increase in the volume of capital accumulation in the host country.

On the other hand, Bakare (2011) described capital formation as the proportion of present income saved and invested in order to augment future output and income. It usually results from acquisition of new factory along with machinery, equipment and all productive capital goods. Capital formation is equivalent to an increase in physical capital stock of a nation with investment in social and economic infrastructure. Gross fixed capital formation can be classified into gross private domestic investment and gross public domestic investment. The gross public investment includes investment by government and public enterprises. Gross domestic investment is equivalent to gross fixed capital formation plus net changes in the level of inventories.

2.2 Theoretical Literature

Accelerator theory of investment, a Keynesian concept, postulates that whenever investment expenditure increases either demand or income increases. The theory stipulates that capital investment outlay is a function of output. For instance, a rise in national income, as measured by the gross domestic product (GDP), would see a proportional increase in capital investment spending. The theorists argued that when income or consumption increases, investment will increase by a multiple amount which is against the Keynesian concept of multiplier that as the investment increases, income increases by a multiple amount. As regards the foreign direct investment, Ugwuegbe (2012) noted that the center-piece of the neoliberal School otherwise known as the Pro-Foreign Investment School is that FDI can provide crucial help in modernizing the industrial order for the developing countries. They also believed that Trans-national Corporations (TNCs), through their FDI, could provide much of the 'motor' needed for economic growth in developing countries (Penrose, 1961 and Chenery and Stout, 1966).

As opposed to the claim of the dependency theorists that FDI leads to transfer of economic control and wealth to foreign powers ultimately leading to economic marginalization of the FDI host countries, neo-liberals argue that FDI provides vast benefits to recipient firm and host economies of TNCs affiliates (Matzner, 1996). Firstly, they believe that FDI brings crucial western knowledge and value in the form of superior Western management qualities, business ethics, entrepreneurial attitudes, better labour/capital ratio, and production techniques. Secondly, FDI makes possible industrial grading by tying firms of developing countries hosting TNCs affiliates into global research and development (R&D) networks, and thus resulting in technology transfer as well as providing a greater deal of investment fund (Fisher and Gelb 1991). Thirdly, FDI leads to the growth of enterprises by providing access to Western markets. This growth in turn provides a source of new jobs and stimulates demand for input from domestic suppliers. And so, FDI introduces new market entrant beyond the domestic economies hosting TNCs affiliates (Apter, 1965). However, Bende-Nabende and Ford (1998) submit that the wide externalities in respect of technology transfer, the development of human capital and the opening up of the economy to international forces, among other factors that come along with FDI, have served to change the pace of economic growth.

2.3 Empirical Literature

A number of studies have analyzed the relationship between FDI inflows and economic growth, but the issue is far from settled in view of the mixed findings reached. According to Buckley *et al.* (2002), the extent to which FDI contributes to growth depends on the economic and social conditions or, in short, the

quality of environment of the recipient country. This quality of environment he noted relates to the rate of savings in the host country, the degree of openness and the level of technological development. Host countries with high rate of savings, open trade regime and high technological product would benefit from increased FDI to their economies.

De Gregorio (2003) while contributing to the debate on the importance of FDI, notes that FDI may allow a country to bring in technologies and knowledge that are not readily available to domestic investors and, in this way, increase productivity growth throughout the economy. FDI may also bring in expertise that the country does not possess, and foreign investors may have access to global markets; in fact, he found that increasing aggregate investment by 1 percentage point of GDP increased economic growth of Latin American countries by 0.1% to 0.2% a year, but increasing FDI by the same amount increased growth by approximately 0.6% a year during the period 1950-1985, thus indicating that FDI is three times more efficient than domestic investment.

De Gregorio (2003) did a panel data analysis of 12 Latin American countries in the period 1950-1985 and his results suggest a positive and significant impact of FDI on economic growth. In addition, he noted that the productivity of FDI is higher than the productivity of domestic investment for the period under review. Findings of Xu, (2000) for US FDI in 40 countries for the period 1966-1994 also support the findings of De Mello (1990) that technology transfer from FDI contributes to productivity growth in developed countries but not in developing countries, which he attributes to lack of adequate human capital.

In contrast to this submission by the pro-foreign investment school, the dependency theory advocates FDI as the advanced guard for a new diplomacy of economic imperialism (Bailey, 1995; Inziet, 1994; Aslund, 1995; Ake, 1996; Landsburg, 1979; Hejdra, 2002). This school is of the opinion that FDI adversely affect the development of the host country by disarticulated development, exploitation of the domestic economy by the TNCs, creating room for uneven development between the industrially developed nation and that of developing and developed nations alike. They also argued that it perverts social and political structure of the host nations as well destroy their cultural pattern.

Gilpin (1987) asserts that dependency theorists recommended that what is needed to end the exploitation mentioned above is the destruction of the linkage between international capitalism and the domestic economy. This, he noted, can be achieved through the political triumph of a revolutionary national leadership that will overthrow the clientele elite and replace it with one desirous of independent economic development programs.

Durham (2004), for example, failed to establish a positive relationship between FDI and growth, but instead suggests that the effects of FDI are contingent on the “absorptive capability” of host countries. Firebaugh (1992) lists several additional reasons why FDI inflows may be less profitable than domestic investment and may even be detrimental. The country may gain less from FDI inflows than domestic investment because multinationals are less likely to contribute to government revenue; FDI is less likely to encourage local entrepreneurship; multinationals are less likely to reinvest profits; they are less likely to develop linkages with domestic firms; and are more likely to use inappropriately capital-intensive techniques. FDI may be detrimental if it crowds out domestic businesses and stimulates inappropriate consumption pattern.

There has not been a consensus in the findings of different scholars as to how FDI contribute to the growth of domestic economy. This however can be attributed to the inability of these researchers to take a look at the impact of FDI on major macroeconomic variables. Little or no study has actually considered the impact of FDI on capital formation which is crucial for economic growth and development of any domestic economy. Economic theories have shown that capital formation plays a crucial role in the models of economic growth (Beddies 1999; Gbura and Thadjimichael 1996, Gbura, 1997). This view called capital fundamentalism by Youopoulos and Nugent (1976) has been reflected in the macroeconomic performances of many countries.

According to Bakare (2011) in 1986, the government of Nigeria considered the need for improvement in capital information and pursued an economic reform that shifted emphasis on private sector. The public sector reforms were expected to ensure that interest rates were positive in real terms and to encourage savings, thereby ensuring that investment funds would be readily available to the real sector. Besides this, the reforms were expected to lead to efficiency and productivity of labor; efficient utilization of economic resources, increase aggregate supply, reduces unemployment and generate low inflation rate. For example, during 1980s, gross fixed capital formation average 21.3 percent of GDP in Nigeria. This proportion increased to 23.3 percent of GDP in 1991 and declined to 14.2 percent of GDP in 1996. It picked and increased to 17.4 percentage in 1997 and average 21.7 during 1997 to 2000. The gross capital formation rose from 22.3 percent of GDP in 2000 to 26.2 percent in 2003 and declined drastically to 21.3 percent in 2005.

Omorokunwa and Ajao (2019) examine the impacts of fiscal policy on public-private investment in Nigeria using an annual data of 1981-2016. Employing the ARDL bound estimator, they found that expenditures have direct effect on investment both in short-run and long-run with a weak negative influence. The result implies that there is need for government fiscal policy to focus more inwards on a long-term increase of investment in Nigeria. Mabula and Mutasa (2019) investigate the extent at which public debt impacted on private investment in Tanzania for the period of 1970-2016. Using an Autoregressive Distributed Lag (ARDL) bound test, the results suggest a significant nonlinear long run and short run relationship between external debt and private investment. At the conventional level, the study found no

significant evidence of long run and short run relationship between domestic debt and debt service as well as for private investment. Yet, the combined effect of domestic and external debt on private investment is statistically significant both in long run and short run. While investigating the effects of fiscal policy on private investment in Nigeria using an annual data from 1980 to 2017, Abdulkarim and Saidatulakmal (2021) found that direct taxes are distortive and stifle private investment growth, whereas indirect taxes encourage it. Also, capital spending enthused private investment while external debt impeded it.

Olaoye (2019) examines the relationship between external debt and private investment in Nigeria for the periods 1981-2016. Based on the debt overhang and financing gap theories, the results show that private investment is indirectly related to debt overhang both in the short-run and long-run. Further, a marginal increase in the current year debt service leads to a higher growth than the proportionate decrease in current ratio of debt overhang. Finally, interest rate, exchange rate and inflation rate positively impacted on debt overhang ratio. While examining the relationship between external financing and industrial sector output between 1986 and 2018, Imoughele (2020) found a long run relationship between industrial sector output and selected external financing variables such as foreign direct investment, foreign private investment, remittance, and official development assistance. Further, the study found that external financing significantly impacted on the country's industrial output in the short-run. Meanwhile, in the long run, foreign direct investment, remittance and official development assistance have direct and significant effect on Nigeria industrial output.

Evidence from past studies shows the need to conduct an empirical investigation between FDI and capital formation as there are few studies conducted in developing countries including Nigeria. Also, the existing empirical evidence on the causal relationship between FDI and capital formation and the associated benefits is very inconclusive. In spite of a seemingly positive association between FDI and capital formation, the empirical literature has not reached a consensus on the direction of this impact however suggesting that Foreign Direct Investment can be either beneficial or harmful to capital formation. The principal driving force for this work is that for developing economies, and for Nigeria in particular, the issue of capital formation is an important one. The country has been stimulating growth with the help of various techniques, including policies that would aim at foreign capital and technology transfer. It is thus, of interest to

investigate whether the start of growth can be attributed to weak capital formation which has not discouraged inflow of FDI into the country over the period under review.

3. METHODOLOGY

3.1 Theoretical Framework and Model Specification

The theoretical foundation of this study hinged on the accelerator theory of investment to explain the macroeconomic determinants of investment in Nigeria. The theory states that when income or consumption increases, investment will increase by a multiple amount. It implies that when the income and consumption of the people increases, there is a need for a higher amount of the commodities to be produced. Thus, it will require more capital to produce more goods since the already given stock of capital is fully used. The investment in this case, is induced by changes in income or consumption which is known as induced investment. The accelerator is the numerical value of the relation between the increases in investment resulting from an increase in income. The net induced investment will be positive if income increases and induced investment may fall to zero if the income or output remains constant.

The hypothetical illustration of the theory shows that if a certain amount of output (Y) is required to be produced and the capita-output ration is α , the required amount of investment to produce the required output (Y) is given as:

$$K_t = \alpha Y_t \quad (1)$$

Where; K is the stock of capital; Y stands for the level of output or income; α is the capital – output ratio; and t is time. The capital-output ratio α is $\frac{K}{Y}$ and in the theory of accelerator, the capital output ratio is assumed to be constant. Therefore, under the assumption of constant capital output ratio, changes in output are made possible by changes in the stock of capital.

The study of Ghura and Goodwin (2000) employed the following framework for the analysis of the determinants of domestic investment using panel data from (31) developing countries. The model is stated as:

$$K_t = \alpha + \beta X_t + \mu_t \quad (2)$$

Where; K represents capital stock, X are the observable variables representing factors affecting capital formation, α and β are parameters, and μ is a random error term with a mean of zero.

Several studies have also been conducted by including a quite number of exogenous variables in the capital formation equation such as foreign direct investment, financial intermediation, exports, human capital, and domestic credit availability (Ghura and Goodwin, 2000; Fry, 1998; Agrawal, 2000). This study modified the model by stating the capital formation measured by gross fixed capital formation as a function of FDI, output, interest rate, inflation rate, exchange rate and government expenditure, which is stated as:

$$CAP_t = \alpha_0 + \beta_1 FDI_t + \beta_2 GDP_t + \beta_3 INT_t + \beta_4 INF_t + \beta_5 EXR_t + \beta_6 GEP_t + v_t \quad (3)$$

Where; CAP is capital formation; GDP is gross domestic product; INT is interest rate; INF is inflation rate; EXR is exchange rate; GEP is government expenditure; α_0, β_{1-6} are parameters; t is time; v is error term.

3.2 A’Priori Expectation

The study expects the FDI and GDP to exert positive effect on capital formation. This implies that as the aggregate demand of the Nigerian economy increases, the level of capital formation will increase. It further indicates that an economy with high inflow of foreign capital will build up the capital formation of domestic

investors. The study expects an inverse relationship between capital formation and interest rate. An increase in interest rate will push the cost of capital upward which will reduce the volume of economic activities, and thus, the level of capital formation. However, in a developing country like Nigeria, its effect on capital formation is ambiguous because there is also the argument that a higher real interest rate increases the flow of bank credits, which complements the private sector savings and enhances capital formation and hence private sector investment. Similarly, the effect of real exchange rate on capital formation is also ambiguous. This is so because on one hand a higher level of real exchange rate reduces capital formation in the sense that the devaluation of a nation's currency means a fall in the real income of the economy as a whole, thus reducing productive capacity, increase the real cost of purchasing imported capital goods, which will eventually lead to a decline in the profitability of the private sector and ultimately a fall in capital formation. Conversely, real exchange rate can also have a positive relationship with capital formation. This occurs when currency devaluation in an economy enhances its competitiveness with the rest of the world and also expands its exports volumes. This type of scenario makes a country looks inward, relies majorly on its internal resources and industries thereby boosting capital formation in the country.

The inflation rate is expected theoretically to be negatively related to capital formation. This is due to the fact that as inflation increases, the value of real money falls, cost of production increases volume of economic activity reduces, profit falls, performance drops and ultimately, capital formation reduces.

3.3 Data: Approaches, Scope and Source

The study utilized the Autoregressive Distributed Lag (ARDL) bounds approach by Pesaran, Shin and Smith (2001) to examine the effect of foreign direct investment on capital formation in the long and the short run periods in Nigeria. With this approach, capital formation is expressed as a function of the lagged value of itself and the current and the lagged values of the explanatory variables. Prior to the ARDL bound test, the study examines the stationarity level of the indicators using the Augmented Dickey Fuller (ADF) test. The Econometric Views 9.0 was used as the statistical package for the estimation of the multiple regression models. The estimated parameters are subjected to evaluation by using the student t-statistic test and F-statistic test. The scope of our data spans from 1981 to 2020 and are sourced from Central Bank of Nigeria (2020) and World Development Indicators (2020). The time frame for the analysis is chosen based on availability of data from various sources.

4. RESULT AND DISCUSSION OF FINDINGS

4.1 Descriptive Analysis

This section deals with econometric analysis between FDI and capital formation in Nigeria between 1981 and 2020. Table 1 presents the descriptive analysis of the time series properties of the variables included in the model. The descriptive statistics was carried out to illustrate the FDI determinant of capital formation in Nigeria from 1981 to 2020. The table shows that the mean value of government expenditure (GEP), gross domestic product (GDP), exchange rate (EXR), interest rate (INT), inflation rate (INF), foreign direct investment (FDI) and capital formation (CAP) stood at ₦1,525.34 billion, ₦31,757.15 billion, ₦76.59/US dollar, 13.01%, 19.6% ₦372.12 billion and ₦5,113.11 billion correspondingly. The standard deviation of government expenditure (GEP), gross domestic product (GDP), exchange rate (EXR), interest rate (INT), inflation rate (INF), foreign direct investment (FDI) and capital formation (CAP) from their respective long term mean values every year point at ₦1,850.78 billion, ₦18,151.71 billion, ₦72.04/US dollar, 4.21%, 17.69% ₦453.91 billion and ₦3,973.31 billion respectively.

Table 1: Descriptive Statistics

	CAP	FDI	GDP	GEP	EXR	INT	INF
Mean	5113.11	372.12	31757.15	1525.34	76.592	13.014	19.603
Median	2804.75	103.78	22391.14	594.09	57.372	13.000	12.547
Maximum	15782.54	1360.31	69023.93	5185.32	253.492	26.000	72.836
Minimum	1798.58	0.145	13779.26	9.637	0.610	6.000	5.3822
Std. Dev.	3973.31	453.91	18151.71	1850.78	72.039	4.209	17.690
Skewness	1.290	0.868	0.875	0.955	0.424	0.691	1.665
Kurtosis	3.451	-0.796	2.318	2.323	1.986	4.066	4.527
Observations	40	40	40	40	40	40	40

Source: Author’s computation (2022).

4.2 Unit Root Test Results

Table 2 presents the results of the time series properties of the variables included in the model. This pre-test was carried out before estimating the long-run and short-run relationship among FDI, government expenditure, gross domestic product, exchange rate, interest rate, inflation rate and capital formation in Nigeria (1981-2020).

Table 2: ADF Unit Root Test Results

Variables	ADF Tau Statistics		Order of Integration
	Intercept	Linear Trend	
GEP	-7.8354 (0) [-3.5885]*	-7.7913 (0) [-4.1809]*	1
GDP	-6.4689 (0) [-3.5885]*	-6.4355 (0) [-4.1809]*	1
EXR	-9.5300 (0) [-3.5885]*	-9.4213 (0) [-4.1809]*	1
INT	-3.7427 (1) [-3.5885]*	-3.7158 (1) [-4.1809]**	0
INF	-3.7626 (3) [-3.6617]*	-3.8085 (4) [-3.5684]**	0
FDI	-6.7828 (2) [-3.5728]*	-6.8891 (2) [-4.3832]*	1
CAP	-5.9107 (0) [-3.5885]*	-6.4217 (0) [-4.1809]*	1

Note: * significant at 1%; ** significant at 5%; *** significant at 10% Mackinnon critical values and are shown in parenthesis. The lagged numbers shown in brackets are selected using the minimum Schwarz and Akaike Information criteria.

Source: Author’s computation (2022).

The Augmented Dickey Fuller (ADF) unit root test results is presented in Table 2 indicate that interest rate (INT), inflation rate (INF) were stationary at levels [I(0)]. However, FDI, government expenditure (GEP), gross domestic product (GDP), exchange rate (EXR) and capital formation (CAP) were reported to be stationary at first difference [sI(1)]. Thus, these series are non-mean reverting at levels and do not converge to their long-run equilibrium until they are first differenced.

4.3 Autoregressive Distributed Lag (ARDL) Results

Econometric literature argued that regressing a stationary series on non-stationary series has severe implications in drawing policy inference. The data series provides evidence for the use of Autoregressive Distributed Lag (ARDL) technique of analysis. As posited by Pesaran *et al.*, (2001), ARDL is more suitable for variables at different order of integration. The F-statistics estimate for testing the existence of long-run relationship between FDI, control variables (such as FDI, government expenditure, gross domestic product, exchange rate, inflation rate and interest rate) and capital formation in Nigeria are presented in Table 3.

Table 3: Existence of Long-Run relationship between FDI and Capital Formation

Test Statistic	Value	K
F-statistics (CAP FDI, GEP, GDP, EXR, INT, INF)	6.9177	45
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Author’s computation (2022).

The estimated F-statistics of the normalized equations ($F_{arb} = 6.918$) is greater than the lower and upper critical bound at 1% significance level. It implies that the null hypothesis of no long-run relationship is rejected at 1% significance level. The implication of the above estimation is that FDI, control variables (such as government expenditure, gross domestic product, exchange rate, inflation rate and interest rate) and capital formation, all have equilibrium condition that keep them together in the long-run. Thus, there exists a long-run relationship between FDI and capital formation in Nigeria.

Table 4: Long Run Coefficients [ARDL: 3,1,0,0,2,0,0]

Dependent Variable: Capital Formation (CAP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.672831	0.267681	2.513555	0.0020
GEP	1.049933	0.918427	1.143187	0.2652
RGDP	0.533420	0.114415	4.662144	0.0001
EXR	-44.565692	9.512391	-4.685015	0.0001
INT	41.348569	66.276542	0.623879	0.5391
INF	-0.271474	14.176285	-0.019150	0.9849
C	-808.818986	209.419908	-3.865644	0.0008

Source: Author’s computation (2022).

4.3.1 Results of Long-run Estimates of FDI and the Level of Capital Formation in Nigeria using the ARDL Approach

The table below reveals the long-run estimates of factors determining private investment in Nigeria. The long-run estimates suggested that foreign direct investment (FDI), government expenditure (GEP), gross domestic product (GDP) and interest rate (INT) have positive impact on capital formation (CAP) in Nigeria. All these conform with theoretical expectation except interest rate. Specifically, a one unit point increase in foreign direct investment (FDI), government expenditure (GEP), gross domestic product (GDP) and interest rate (INT) increase capital formation (CAP) by 0.67, 1.05, 0.533 and 41.35 respectively. However, exchange rate (EXR) and inflation rate (INF) have negative impact on capital formation (CAP) in Nigeria. This does conform with a priori expectation. Thus, if the exchange rate (EXR) and inflation rate (INF) increase by one unit point, capital formation (CAP) is expected to reduce by 44.57 and 0.27 respectively.

4.3.2 Error Correction Models using the ARDL Approach

The short-run dynamic relationship between foreign direct investment and capital formation in Nigeria indicating the second part of the estimated ARDL model is reported below in Table 5. The lag lengths were selected based on Akaike Information Criterion (AIC). The table below reveals the short-run dynamic estimates among variables of interest.

Table 5: Estimated Short-run Error Correction Model [ARDL: 3,1,0,0,2,0,0]

Dependent Variable: Private investment (ΔINV)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAP(-1))	0.117765	0.136291	0.864072	0.3969
D(CAP(-2))	0.312229	0.148058	2.108830	0.0466
D(FDI(-2))	0.517893	0.238302	2.173263	0.0321
D(GEP(-1))	-0.481253	0.390551	-1.232241	0.2309
D(RGDP(-1))	0.244501	0.051691	4.730031	0.0001
D(EXR(-1))	8.961838	6.741685	1.329317	0.1974
D(EXR(-2))	20.607542	8.361808	2.464484	0.0220
D(INT(-1))	18.952730	30.685213	0.617650	0.5431
D(INF(-1))	-0.124434	6.494522	-0.019160	0.9849
ECT(-1)	-0.458365	0.098716	-4.643272	0.0001

Source: Author’s computation (2022).

The short-run estimates suggested that the first and second lags of capital formation (CAP) exact positive impact on the current level of capital formation (CAP) in Nigeria. Thus, the short-run estimate of the lags of FDI was also consistent with the findings in long-run. The coefficients of other control variables were also reported in Table 5. The error correction term indicates the speed of adjustment to restores equilibrium in the model. The value is negative also significant at 1% significance level. Specifically, the lag of the error correction term (ECT) was found statistically significant at 1% level with the co-efficient of -0.4584. This indicates that 45.8% of the distortion in the short-run is corrected in the first year in attaining equilibrium or capital formation on the basis of the changes in its factor determinants like FDI, government expenditure, gross domestic product, exchange rate, inflation rate and interest rate in Nigeria.

4.4 Diagnostic Tests

The estimated ARDL model is tested for heteroscedasticity, serial correlation, functional form misspecification, parameter stability and normality. The results from these tests are shown in Table 6.

Table 6: Diagnostic Tests of Selected ARDL Model

Results	
Serial Correlation: 0.1581 [0.8548]	Normality Test: 0.1372 [0.9337]
Functional Form: 0.5878 [0.5629]	Heteroskedasticity Test: 4.0669 [0.0029]

Source: Author’s computation (2022).

The estimated ARDL model revealed that the model passed the serial correlation and normal test but failed the heteroskedasticity tests. However, the Ramsey RESET test was also satisfactory for the ARDL model.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study investigates the links between foreign direct investment and capital formation in Nigeria for a period of 1981 to 2020. The unit root test result using augmented Dickey Fuller test indicated that interest rate and inflation rate were stationary at levels. However, FDI, government expenditure, gross domestic product, exchange rate and capital formation were reported to be stationary at first difference. Thus, these series are non-mean reverting at levels and do not converge to their long-run equilibrium until they are first differenced.

Using the autoregressive distributed lag model, the results show that all FDI and capital formation have equilibrium condition that keeps them together in the long-run. The findings further show that FDI, government expenditure, gross domestic product and interest rate have positive impact on private investment in Nigeria and all these conform with theoretical expectation except interest rate. However, exchange rate and inflation rate have negative impact on private investment in Nigeria. The short-run

estimates suggested that the first and second lags of capital formation exact positive impact on the current level of capital formation in Nigeria. Thus, the short-run estimates of the lags of FDI reported positive and significant effects. The first-lag of the error correction term (ECT) was found statistically significant at 0.05 critical value and correctly signed with the co-efficient of -0.4584. This indicates that 45.84% of the distortion in the short-run is corrected in the first year in attaining equilibrium or capital formation on the basis of the changes in FDI and other factors like government expenditure, gross domestic product, exchange rate, inflation rate and interest rate in Nigeria.

The study suggests that the need for government to continue to attract foreign investment as it stimulates the capital formation channel towards enhancing output growth that is capable of promoting poor. Also, the financial sector most especially the apex bank, should ensure proper mobilization of investible fund in the economy through high saving deposits rates and accessibility of such fund by private investors through low lending rate. The study further noted that the Minimum Rediscounting Rate (rechristened Monetary Policy Rate (henceforth MPR) by the Central Bank of Nigeria in 2006), which is under the perpetual grip of the Central Bank of Nigeria, has the capacity to influence other rates of interest in the economy, hence should be used adequately.

References

- Abdulkarim, Y., & Saidatulakmal, M. (2021). The Impact of Fiscal Policy Variables on Private Investment in Nigeria. *African Finance Journal*, 23(1), 41-55.
- Adebayo, E. O., & Gambiyo, S. P. (2020). Economic analysis of the determinants of foreign direct investment (FDI) in Nigeria. *Arch Bus Res*, 8(1), 74-81.
- Adelegan, J. O. (2000). Foreign direct investment and economic growth in Nigeria: A seemingly unrelated model. *African Review of Money, Finance and Banking*, Supplementary Issue of "Savings and Development", 2000, 5-25. Milan, Italy.
- Akinlo, A. E. (2004). Foreign direct investment and growth in Nigeria: An empirical investigation. *Journal of Policy Modelling*, 26(2), 627-39.
- Alimi, O. Y. (2017). Globalization and non-oil export performance in Nigeria: A bound cointegration approach. *Euro Economica*, 11(2), 44-54.
- Alimi, O. Y., & Alese, O. J. (2017). Comparative analysis of investment funding in the Nigerian oil and agricultural sector. *International Journal of Economics and Accounting*, 8(1), 67-82.
- Alimi, O. Y., Yinusa, O. G. & Ilo, B. M. (2016). Validity of export-led growth hypothesis for Nigeria: Further evidence. *Yobe Journal of Economics*, 3, 127-135.
- Aremu, J.A. (1997). Foreign private investment: Issues, determinants and performance. Paper presented at a workshop on *Foreign Investment Policy and Practice*, organized by the Nigeria Institute of Advance Legal Studies, Lagos.
- Bakare, A.S. (2011). A theoretical analysis of capital formation and growth in Nigeria. *Far East Journal of Psychology and Business*, 3(1), 41-56.
- Beddies, C. (1999). Investment, capital accumulation and growth: Some evidence from Gambia: 1964-1998. *IMF Working Paper 99/117*, August.
- Bende-Nabende, A. & Ford, J. L. (1998). Foreign direct investment, policy adjustment and endogenous growth: Multiplier effect from dynamic for Taiwan 1959-1995. *World Development*, 26(7), 1315-1330.
- Buckley, P., Clegg, P. & Wang, C. (2002). The impact of inward FDI on the performance of Chinese manufacturing firms. *Journal of International Business Studies*, 33(4), 637-655.

- Central Bank of Nigeria (2004), Annual report and statement of accounts, Abuja, Nigeria. Accessed from <http://www.cenbank.org.12/06/2010>
- Central Bank of Nigeria (CBN, 2006). Central Bank of Nigeria Statistical Bulletin, December.
- Central Bank of Nigeria (CBN, 2020). Central Bank of Nigeria Statistical bulletin, July, volume 31.
- Chenery, H. B. & Stout, A. (1966). Foreign assistance and economic development. *American Economic Review*, 55, 679-733.
- Contractor, F. J., Dangol, R., Nuruzzaman, N., & Raghunath, S. (2020). How do country regulations and business environment impact foreign direct investment (FDI) inflows? *International Business Review*, 29(2), 101640.
- De Gregorio, J. (2003). *The role of foreign direct investment and natural resources in economic development*. Working Paper, No 196, Central Bank of Chile, Santiago.
- Durham, J. B. (2004). Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. *European Economic Review*, 48(2), 285-306.
- Engle, R. F. & Granger, C. J. (1987). Cointegration and error-correction representation, estimation and testing. *Econometrica*, 55, 251-278.
- Ghirmay, S. G. and Cadet, M. (1998). Direct Foreign Investment's Impact on Private Capital Formation in Sub-Saharan Africa. *African Economic and Business Review*, Vol. 1, Num 2,
- Ghura, D. (1997). Private investment and endogenous growth: Evidence from Cameroon. IMF Working Paper97/165, December.
- Ghura, D. and Hadji M. T. (1996). Growth in Sub- Saharan Africa I, *Staff Papers*, International Monetary Fund, 43, September.
- Gilpin, A. (1987). Foreign direct investments local content requirement and profit taxation. *The Economic Journal*, 108, 444-457.
- Haug, A. (2002). Temporal aggregation and the power of cointegration tests: A Monte Carlo study. *Oxford Bulletin of Economics and Statistics*, 64, 399-412.
- Imoughele, L. E. (2020). External financing and industrial sector output in a deregulated economy: Econometric evidence from Nigeria. *Journal of Economics and Allied Research*, 4(2), 141-160.
- Joghee, S., Alzoubi, H. M., & Dubey, A. R. (2020). Decisions effectiveness of FDI investment biases at real estate industry: Empirical evidence from Dubai smart city projects. *International Journal of Scientific & Technology Research*, 9(3), 3499-3503.
- Johansen, S (1988). Statistical analysis of cointegrating vectors. *Journal of Economic Dynamics and Control*, 12, 231-54.
- Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2), 169-210.
- Johansen, S. and Juselius, K. (1990). Maximum likelihood estimation and inferences on cointegration – with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169 – 210
- Khan, A. (2007). *Foreign direct investment and economic growth: The role of domestic financial sector*. PIDE Working Paper.
- Mabula, S., & Mutasa, F. (2019). The effect of public debt on private investment in Tanzania. *African Journal of Economic Review*, 7(1), 109-135.

- Maku, O. E. & Alimi, O. Y. (2018). Fiscal Policy Tools, Employment Generation and Sustainable Development in Nigeria. *Acta Universitatis Danubius. Œconomica*, 14(3), 186-199.
- Narayan, P., & Smyth, R. (2005). Trade liberalization and economic growth in Fiji: An empirical assessment using the ARDL approach. *Journal of the Asia Pacific Economy*, 10(1), 96-115.
- Olaoye, O. O. (2019). External debt and private investment in Nigeria. *BVIMSR's Journal of Management Research*, 11(1), 19-28.
- Omorokunwa, O. G., & Ajao, M. G. (2019). Fiscal Policy and Public-Private Investment in Nigeria. *Amity Journal of Finance*, 4(1), 16-29.
- Orji, A. and Mba, P. N. (2011). Foreign private investment, capital formation and economic growth in Nigeria: A two stage least square approach. *Journal of Economics and Sustainable Development*, 2(3), 11-23.
- Otepolo, A. (2002). *Foreign direct investment as a factor of economic growth in Nigeria*. Africa Institute for Economic Development and Planning (JDEP), Dakar, Seregal.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289-326.
- Shiro, A. A. (2009). *The impact of foreign direct investment on the Nigerian economy*. Department of Finance, University of Lagos, Nigeria.
- Umah, K. E. (2007). The impact of foreign private investment on economic development of Nigeria. *Nigeria Journal of Economics and Financial Research*, 1(3), 63-72.
- UNCTAD. (2001, 2004). *World investment report*. Geneva: United Nations Conference on Trade and Development.
- World Bank (1996). *World debt tables: External finance for developing countries. Analysis and summary tables*. Washington, D.C. The World Bank.
- World Bank (2018). World development index. Accessed from <https://datacatalog.worldbank.org/dataset/world-development-indicators>
- Xu, B. (2000). Multinational enterprises, technology diffusion, and host country productivity growth. *Journal of Economics*, 62, 477-493.
- Yotopoulos, P. & Nugent, J. (1976). *Economics of development: Empirical investigations*. New York: Harper and Row.