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Foreign capital inflows and economic development in Nigeria: An autoregressive distributed lag approach

Augustine A Anaele[1], Clement Korgbeelo[2]
[1] PhD, Department of Economics, Faculty of Social Sciences, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Nigeria
[2] Department of Economics, Faculty of Social Sciences, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Nigeria

Abstract
Due to the poor performance of the Nigerian economy over the years, the country has been experiencing high and rising unemployment levels, high inflation rates dwindling economic growth among others. Capital is therefore needed to put the Economy on the path of sustainable growth and development. However, due to the general prevalence of low income and consequently, low savings, it will be difficult to accumulate large enough capital required for reasonable rates of growth and development from the domestic economy foreign, capital is therefore needed to complement domestic capital for sustainable growth and development. This study therefore examines the impact of foreign capital inflows on the development of the Nigerian economy. This study therefore examines the impact of foreign capital inflows on the development of the Nigerian economy. Specifically, the study examines the impact of foreign direct investment (FDI), foreign portfolio investment (FPI) and migrant workers' remittances (RMT) on two indicators of development, namely, economic growth (proxied by the growth rate of per capital real gross domestic product) and economic misery. Annual time-series data from 1981 to 2018 were used. The autoregressive distributed lag (ARDL) approach was used to estimate the data. The result of the data estimation showed that, in the long-run, foreign direct investment and foreign portfolio investment have strong positive impact on economic growth while remittances have weak negative impact on economic growth in Nigeria. Also, FDI has weak positive impact on economic misery. In the short-run, FDI and FPI have insignificant positive impact on economic growth while remittances have weak negative impact on economic growth. Also, FDI and FPI have weak positive relationship with economic misery while remittances has weak negative impact on economic misery. It is recommended, inter alia, that there should be a general improvement in the country's macroeconomic environment so as to attract the inflow of more foreign capital and to stabilize them for improved performance on the economy.

Keywords: foreign capital, fdi, fpi, remittances, development, ardl

Introduction

In terms of delivering core development objectives, the performance of the Nigerian economy over the years, has not been satisfactory. Consequently, the country has been experiencing high inflation rates, high and rising levels of unemployment, high incidence of poverty, dwindling economic growth, poor industrial sector performance among others (Anyanwu, Oyefusi, Daikhenan and Dimowo, 1997; Central Bank of Nigeria, 2010) [6]. It is therefore necessary to deliberately put the economy on the path of sustainable growth and development. But economic growth and development, to a large extent, depend on capital accumulation which in turn, depends on savings from current income (Akpankpan, 1999) [3]. However, due to the general prevalence of low income and consequently, low savings among the people, it will be difficult to accumulate large enough capital required to achieve reasonable rates of growth and development. The main reason for low income is that, the oil sector, which is the mainstay of the economy, is prone to crisis and therefore unstable. Besides, the oil sector which is highly capital intensive has been described as an economic enclave characterized by a peculiar mode of operation and privileges. Consequently, even when there is an increase in the amount of oil resources exported, it does not necessarily translate into higher income for the majority of the people (Robinson, 2003) [33]. The fortunes of the oil sector are therefore sort of detached from the masses.

From the foregoing, the need therefore arises to use foreign capital to augment domestic capital for sustained economic growth and development of the country. Foreign capital plays a significant role in fostering economic growth and development in less developed countries. In the face of domestic resource deficiency in financing long-term development, most developing countries rely on external financial resources (Chorn and Siek, 2017) [13]. According to Chorn and Siek (2017) [13], foreign direct investment is an important source of capital which facilitates the transfer of modern technology, knowledge, skills and innovations of technologically advanced countries to developing countries. This helps in accelerating the speed of their development process. Odionye and Emerole (2015) [26] identified remittances as an important source of economic growth and development in the less-developed countries. Similarly, sustained inflows of foreign portfolio capital is generally considered as an important avenue for raising capital for private domestic investment in developing countries (Duasa

and Kassim, 2009; Olotu and Jegbefume, 2011; Winona and Nazula, 2016; Baghebo and Apere, 2014, etc) [28, 39, 7]. From the foregoing, this study examines the role of foreign capital in stimulating economic development in Nigeria. Specifically, the study examines the impact of foreign direct investment, foreign portfolio investment, migrant workers' remittances on two indicators of development, namely, economic growth (proxied by the growth rate of per capita real gross domestic product) and misery index.

Conceptual Clarifications and Literature Review

Conceptual Clarifications

The Concept of Economic Growth and Development

Economic growth has been conceptualized in two different ways. In the first place, it is defined as sustained annual increases in an economy's real national income or output. Used in this sense, economic growth is conceived as sustained increase in total output of goods and services over time (Nwaimo, 2009) [25]. This conceptualization of economic growth has been criticized on the ground that it does not account for the increase in population and its implication on the standard of living of the people. The argument is that national output may be increasing and yet, the standard of living will be falling if the population is growing faster than the increase in national output (Ahuja, 2013) [1].

A second and indeed, a better way to define economic growth is in terms of income per capita. In this sense, economic growth is defined as the annual increase in real per capita income of a country over a given period of time (Ahuja, 2013) [1]. This second view of economic growth is better since it takes into cognizance the implication of rising population on the citizens' standard of living. It is in this sense that the concept is used in this study.

On its part, economic development is defined as a process of improvement in the various aspects of the economy and the society it supports (Akpankpan, 1999) [3]. On their part, Todaro and Smith (2011) [36], see economic development as "a process involving major changes in the social structure, popular attitudes, and national institutions as well as the acceleration of economic growth, the reduction of inequality and the eradication of poverty".

The Concept of Foreign Capital

Capital, in economic parlance, is used to denote any produced means of production. That is, any good set aside for further production of goods and services (Dewell, 2001). Foreign capital therefore refers to the capital that originates from outside the domestic economy. For the purpose of this study, foreign capital includes foreign direct investment, foreign portfolio investment and migrant workers' remittances. Foreign direct investment refers to when a foreign national acquires a productive facility located in another country (the host country) and manages it or takes part in its management (Akpakpan, 1999) [3]. Foreign portfolio investment are investment in purely financial assets. It is a type of capital flow under which foreign entities such as banks, insurance companies, mutual and pension funds managing companies, private individuals, etc. acquires securities, bank deposits, and/or grant private loans in the financial markets of other countries (Akpakpan, 1999, Ahuja, 2013) [3, 1].Remittances is defined by the Central Bank of Nigeria (2008) as both financial and non-financial resources freely sent home to migrants' households in their home countries.

The Misery Index

The Misery Index is an economic indicator that determines how the average citizen is doing economically. The original misery index was developed by a Yale University Professor, Arthur Okun in the 1970s. The misery index as created by Arthur Okun has undergone certain modifications over the years. The first modification took place in 1999 by Robert Barro. Later on, Hanke improved on Barro's Misery Index. Hanke's annual misery index is the sum of unemployment, inflation and bank lending rates minus the growth rate of real GDP per capita (Kenton, 2018) [21].

Theoretical Literature Review

This study is theoretically underpinned by the two-gap model which is a logical extension of the Harrod-Domar growth model. One of the earliest models in economics that links capital to economic growth and development is the Harrod-Domar model formulated by Harrod (1939) and Domar (1946) [16]. The Harrod-Domar model identifies the necessary conditions needed to attain steady state (equilibrium) rate of growth in a closed economy. They assign key roles to savings, capital and investment in the development process (Jhingan, 2007; Ibrahim and Akinbobola, 2017) [19]. Thus, in every society, there is the need to save a certain percentage of current income to take care of depreciation of capital assets. Hence, for growth and development to be achieved, new investments (i.e. net addition to the capital stock) are necessary. If we assume a direct relationship between the size of the capital stock (K), and total income (Y), it follows that any addition to the capital stock (i.e. new investments) will bring about corresponding increase in the flow of national output (Y). This relationship is known as capital-output ratio, designated as c. Presented below is a simplified version of the Harrod-Domar model using Todaro and Smith (2011) [36], specification:

$$S = sY \quad \text{..... 2.2.1}$$

Where S = total national savings, s = net savings ratio and Y = national output ratio; equation 2.2.1 above states that national savings (S) is a proportion, s, of national output (Y).

$$I = \Delta K \quad \text{..... 2.2.2}$$

Where I = net investment, K = total capital stock and Δ = change notation. Equation 2.2.2 defines net investment (I) as the change (Δ) in capital stock (K). Recall that the capital output ratio, c, expresses a direct relationship between total capital stock (K) and national output (Y).

That is, $c = K/Y \Longrightarrow K = cY$

Or

$$c = \frac{\Delta K}{\Delta Y} \Longrightarrow \Delta K = c\Delta Y \quad \text{..... 2.2.3}$$

Equation 2.2.3 states that change in capital stock (ΔK) brings about a proportionate change in national output (Y).

Given the equality between net national savings (S) and net investment (I), we have

$$S = I \quad \text{2.2.4}$$

Equating equations 2.2.1, 2.2.2 and 2.2.4, we have

$$I = \Delta K = c\Delta K \quad \text{2.2.5}$$

The savings-investment equality identity in equation 2.2.4 can be written as

$$S = sY = c\Delta Y = \Delta K = I \quad \text{2.2.6}$$

Or simply as

$$sY = c\Delta Y \quad \text{2.2.7}$$

Diving through equation 2.2.7 first by Y and then by C, we obtain the following expression:

$$\Delta Y/Y = s/c \quad \text{2.2.8}$$

The LHS of equation 2.2.8 (i.e. ΔY/Y), represents the rate of change or rate of growth of GDP.

Equation 2.2.8 is a simplified version of the well-known equation in the Harrod-Domar model of economic growth. It simply states that the growth rate of GDP (ΔY/Y) is determined jointly by the net national savings (s) and the national capital-output ratio (c). In other words, the equation states that the more an economy is able to save and invest out of a given GDP, the higher the GDP and the lower the economy's capital – output ratio (Todaro and Smith, 2011) [36].

It is important to note that one of the key assumptions of the Harrod-Domar model is that the model operates in a closed economy. Hence, a logical extension of the model is the Chenery and Strout (1956) [11] "foreign assistance and development" and Chenery and Bruno (1962) [12] "development alternative in an open economy". Chenery and his colleagues explain that the development process depends on accumulation of foreign capital. They brought in foreign capital on the ground that savings from foreign countries in the form of capital inflows to the domestic economy can be utilized by the developing countries to augment their domestic savings and foreign exchange. The two gaps (savings gap and foreign exchange gap) are expressed in terms of the national income accounting identities.

$$E\text{-}Y \equiv I - S \equiv M - X \equiv F$$

Where E = national expenditure, Y = national output, I = investment, S = savings, M = imports, X = exports and F = net foreign inflows, J - S is the domestic savings gap, and M-X is the foreign exchange gap (Jhingan, 2007).

In essence, therefore, this study is based on the Harrod-Domar model as expanded by the two gap model that foreign capital serves as catalyst for economic growth and development in less developed countries.

Empirical Literature Review

Some of the studies conducted on the foreign capital – economic development nexus are reviewed in this section.

Trimurti, Sukarsa, Budhi and Yasa (2015) [37] examined the determinants of foreign direct investment and its impact on economic growth and unemployment in Jara-Bali, Indonesia. Applying partial least squares (PLS) technique on data from 2004 to 2012, the findings showed that FDI has significant positive effects on economic growth and unemployment.

Alvarado, Inguez and Ponce (2017) [5] examined the impact of FDI on the growth of nineteen Latin American countries using panel data approach. The results showed that FDI has significant direct impact on growth in high income countries but significant negative impact on growth in low income countries. Mishan and Agrawal (2017) [23] studied the impact of FDI on the growth process of the BRICS countries, using simple correlational analysis on data from 2000-2018. The result indicated that FDI has positive impact on growth in Brazil and China but no important impact on the growth of the rest BRICS countries (i.e. Russia, India and South Africa). Sokang (2018) examined the nexus between FDI and economic growth in Cambodia using correlation matrix and OLS regression technique on data from 2006 to 2016. The findings showed that FDI has a direct impact on economic growth. In Nigeria, Okonkwo, Egbunike and Udeh (2015) [27] examined the role of FDI in stimulating economic growth in Nigeria using data from 1980 to 2012. Using ordinary least squares (OLS) method, the findings showed that FDI inflows stimulate economic growth. Akanegbu and Chizea (2017) [2] investigated the impact of FDI on economic in Nigeria. The study applied Augmented Dickey-Fuller (ADF) unit root test, Johansen Cointegration test, Error correction mechanism (ECM) and Granger causality test on annual data for the period 1991 to 2014. The outcome of the study indicated a positive relationship between FDI and economic growth. Applying OLS regression technique on data for the period 1986 to 2017, Alabi (2019) [4] studied the relationship between FDI and economic growth in Nigeria. The outcome of the study showed that FDI has a strong positive relationship with economic growth. Tsaurai (2017) [38] investigated the impact of foreign portfolio investment on economic growth in 14 Asian and European emerging economies using generalized method of moments (GMM) on panel data from 2001 to 2014. The outcome showed that FPI has weak positive impact on economic growth in the 14 countries. Ibrahim and Akinbobola (2017) [19] examined the impact of FPI on economic growth in Nigeria using data from 1986 to 2013. The findings showed that FPI has a long-run strong positive impact on economic growth rate. Similarly, Ezeanyeji and Ifeako (2019) [17] studied the relationship between FPI and growth rate of GDP in Nigeria. Their findings showed that FPi has strong positive impact on GDP growth rate. Tangtipongkul and Khier (2019) applied OLS regression technique on data from 1993 to 2016 to study the impact of remittances on the growth process of Cambodian economy. The study concludes that remittances have a strong positive impact on economic growth in Cambodia. Onyeisi and Odo (2018) [30] investigated the relationship between remittances and economic growth in Nigeria by applying Johansen cointegration and Granger causality tests on data for the period 1980 to 2015.

The results showed that remittances have significant negative impact on economic growth. Olusuyi and Adebayo (2017) [29] examined the nexus between remittances and GDP growth rate in Nigeria for the period 1790 to 2013. The outcome showed that remittances have a strong positive impact on GDP growth rate. Similarly, Loto and Alao (2016) [22] applied vector error correction model (VECM) on data from 1980 to 2015 to study the impact of remittances on economic growth in Nigeria. The outcome indicated that remittances has a strong positive impact on economic growth.

The empirical literature reviewed showed that previous studies in Nigeria concentrated on the impact of foreign capital inflows on economic growth measured in terms of GDP growth rate. This measure of economic growth does not take into cognizance the effects of rapid population growth which may reduce the income per capital and thus, worsen the standard of living of the people. Besides, none of the studies examined the impact of foreign capital on misery index. To fill these gaps, this study examined the impact of foreign capital inflows on economic growth measured in terms of the growth rate of per capita real gross domestic product. This is a better measure of economic growth since it takes into cognizance the effect of population growth which may adversely affect the welfare of the people. This study also examined the impact of foreign capital inflows on misery index.

Methodology

Model Specification

The models used for the study are specified based on Harrod-Domar model as expanded by the Chenery and Strout two-gap model, and the empirical models adopted by Akanegbu and Chizea (2017) [2], and Ibrahim and AKinbobola (2017) [19]. However, the models were slight modified to accommodate the variables of this study.

Model I: Economic Growth Model

The functional form on which the Econometric model is build is expressed as:

$$GRPCRGDP = F(FDI, FPI, RMT, EXR) \quad \text{3.1}$$

Where GRPCRGDP = Growth Rate of Per Capital Real Gross Domestic Product (a proxy for economic growth).
FDI = Foreign Direct Investment
FPI = Foreign Portfolio Investment
RMT = Remittances from migrant workers.
EXR = Naira-Dollar Exchange Rate
F = Functional Notation
GRPCRGDP is the dependent variable while FDI, FPI, RMI and EXR are the explanatory variables. EXR was introduced as a control variable.
The Ordinary Least Squares (OLS) regression equation based on the above functional relation is expressed as:

$$GRPCRGDP = \beta_0 + \beta_1 FDI + \beta_2 FPI + \beta_3 RMT + \beta_4 EXR + U \quad \text{3.2}$$

Where β_0 is the regression constant, β_1, β_2, β_3, and β_4 are the regression coefficients of the parameters, and U is the error term. All other terms are as earlier defined. A logarithmic transformation of equation 3.2 gives us:

$$GRPCRGDP = \beta_0 + \beta_1 \log FDI + \beta_2 \log FPI + \beta_3 \log RMT + \beta_4 EXR + U \quad \text{3.3}$$

Where log is the natural logarithm of the variables. All other terms are as earlier defined.

Model II: Misery Index Model

The mathematical form of the model is expressed as:

$$MI = F(FDI, FPI, RMT, EXR) \quad \text{3.4}$$

Where MI = Misery Index.
MI is the dependent variable. All other variables are as earlier interpreted.
The OLS linear regression equation abased on the above functional relation is expressed as:

$$MI = \alpha_0 + \alpha_1 FDI + \alpha_2 FPI + \alpha_3 RMT + \alpha_4 EXR + U \quad \text{3.5}$$

Where α_0 is the regression constant, while α_1, α_2, α_3 and α_4 are the regression coefficient of the parameters. All other terms are as earlier defined.
Taking the log transformation of equation 3.5 above, we have:

$$MI = \alpha_0 + \alpha_1 Log + \alpha_2 FDI + \alpha_3 LogRMT + \alpha_4 EXR + U \quad \text{3.6}$$

All the variables are as earlier defined.

Apriori Theoretical Expectations

From economic theory, we expect the following signs of the coefficient of the parameter estimates of the explanatory variables.
Model I: $GRPCRGDP = \beta_0 + \beta_1 \log FDI + \beta_2 \log FPI + \beta_3 \log RMT + \beta_4 EXR + U$

$$(\beta_1>0, \beta_2>0, \beta_3>0, \beta_4>0)$$

Model II: $MI = \alpha X_0 + \alpha_1 Log + \alpha_2 FDI + \alpha_3 LogRMT + \alpha_4 EXR + U$

$$(\alpha_1<0, \alpha_2<0, \alpha_3<0, \alpha_4<0).$$

Equations 3.3 and 3.6 can be transformed into ARDL specifications as shown in equations 3.7 and 3.8 for the economic growth and misery index models respectively.

$$\Delta GRPCRGDP = \alpha_0 + GRPCRGDP_{t-1} + \sum_{i=1}^{p} \emptyset j \Delta \log FDI_{t-1} + \sum_{i=1}^{p} h_k \Delta \log FPI_{t-1} + \sum_{i=1}^{p} \beta_L \Delta \log RMT_{t-1} + \sum_{i=1}^{p} \pi_m \Delta EXR + Y_1 G \sum_{i=1}^{p} DP_{t-1} + Y_2 EXR \sum_{i=1}^{p} \log RMT_{t-1} + E_t \quad \text{3.7}$$

$$\sum_{i=1}^{p} \Delta I_t = X_0 + \sum_{i=1}^{p} \sum_{} \Delta + \sum_{i=1}^{p} \emptyset j \Delta I \sum_{i=1}^{p} I_{t-1} + \sum_{} h_k \Delta \log \sum_{i=1}^{p} + \sum_{i=1}^{p} \beta_L \Delta \log R \sum_{i=1}^{p} + \sum_{i=1}^{p} \pi_m \Delta EXR_{t-1} \cdot \sum_{i=1}^{p} \Delta I_{t-1} + Y_2 \log \sum_{i=1}^{p} Y_3 \log FPI_{t-1} + Y_4 \log RMT_{t-1} + Y_5 \log EXR_{t-1} + E_t \quad \text{3.8}$$

The terms with zigma symbol (∑) in equations 3.7 and 3.8 represent the error correction model (ECM) dynamics. The Y^s are the long-run relationships. The symbols α_0, Δ, log, and ε_t represent the constant term, first different operator, natural log and white noise error term respectively. Also, β_1, Øj, h_k, β_L, and π_m represent the short-run effects while ¿, j, k,

l and m represents 1, 2, 3, 4, and 5 respectively and p is the lag strength for the ECM. Other variables are as earlier defined. Equations 3.7 and 3.8 are therefore the short-run and long-run relationships between the dependent variables and the explanatory variables of the models.

Nature and Sources of Data

The study made use of annual time-series data covering the period 1981 to 2018. The data were obtained from secondary sources including the Central Bank of Nigeria Annual Statistical Bulletin for 2018, the Central Bank of Nigeria Annual Reports and Statements of Account (various years), and the World Bank Development Indicators (various years).

Techniques of Data Estimation

The ordinary least squares technique was used to estimate the specified models. However, the OLS regression technique is based on the assumption that the time-series data are stationary. Hence, the OLS analysis was preceded by unit root test. The Phillips-Perron unit root test was used in conducting stationarity test. Based on the results of the unit root test, the autoregressive distributed lag (ARDL) approach was then used in estimating the models. The ARDL approach is based on the condition that the order of integration of the series is either I(0) or I(1) or a combination of both I(0) and I(1), (Nkoro and Uko, 2016). The ARDL approach was developed by Pesaran and Skin (1999) and later extended by Pesaran, Shin and Smith (2001) [32]. Our decision to use ARDL technique is based on the fact that it has the benefit of providing consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I(0) or I(1), (Pesaran, Shin and Smith, 2001) [32].

Presentation of Results and Discussion of Findings

Presentation of Results

Descriptive Statistics

Table 4.1 below shows the results of the descriptive statistics of the variables in the two models:

Table 1: Descriptive Statistics Result

	GRPCRGDP	MI	LOG(FDI)	LOG(FPI)	LOG(RMT)	EXR
Mean	1.614595	44.85514	10.95635	9.214510	9.952137	85.55486
Median	1.500000	40.09000	11.63510	9.530974	11.70015	92.69000
Maximum	11.75000	95.74000	15.98470	15.45394	15.99843	306.1900
Minimum	-9.850000	17.19000	5.577085	5.288267	2.208274	0.630000
Std. Dev.	4.283614	18.33750	2.948078	2.918676	4.999406	84.19822
Skewness	-0.099539	1.207932	-0.540251	0.209218	-0.471852	0.742969
Kurtosis	3.252286	3.731059	2.103215	1.732711	1.704045	2.746532
Jarque-Bera	0.159223	9.821719	3.039718	2.745879	3.962201	3.503063
Probability	0.923475	0.007366	0.218743	0.253361	0.137917	0.173508
Sum	59.74000	1659.640	405.3851	340.9369	368.2291	3165.530
Sum Sq. Dev.	660.5765	12105.51	312.8819	306.6721	899.7860	255216.3
Observations	37	37	37	37	37	37

Source: Author's Computation from E-view 10.0

From the table 4.1, the mean values of the variables, i.e. GRPCRGDP, MI, LOG (FDI), LOG (FPI), LOG (RMT) and EXR are 1.614595, 44.85514, 10.95635, 9.214510, 9.952137 and 85.55486 respectively. The standard deviation shows that EXR (84.19822) is the most fluctuating variable while FPI (2.918676) is the least fluctuating variable. The skewness statistic shows that MI, FPI and EXR are positively skewed while GRPRGDP FDI and RMT are Negatively skewed. The Kurtosis statistic shows that apart from GRPCRGDP and MI which are normally distributed, the other variables are platykurtic (i.e., their values are less than 3).

Phillips-Perron Unit Root Test Result

The results of the Phillips-Perron unit root tests are presented in table 4.2 below.

Table 2: Phillips-Perron Unit Root Test Results

Variable	Phillips-Perron Test Statistic (At Levels)	1% Critical Value	5% Critical Value	Phillips-Perron Test Statistics (At 1st Diff)	1% Critical Value	5% Critical Value	Order of Integration
GRPCRGDP	-2.971437	-4.243644	-3.544284	-16.21642*	-4.252879	-3.54890	I(1)
MI	-2.766995	-4.226815	-3.536601	-9.604774*	-4.234972	-3.540328	I(1)
LOG (FDI)	-1.391817	-4.226815	-3.536601	-13.23301*	-4.234972	-3.540328	I(1)
LOG (FPI)	-3.942954**	-4.226815	-3.536601	-19.19732	-4.234972	-3.540328	I())
LOG (RMT)	-0.983243	-4.226815	-3.536601	-6.568018*	-4.234972	-3.540328	I(1)
EXR	-1.181697	-4.226815	-3.536601	-6.224412*	-4.234972	-3.540328	I(1)

Source: Author's computation from E-view 10.0

Note: * and ** denote rejection of the null hypothesis of unit root at the 1% and 5% significant levels respectively.

From table 4.2 above, GRPCRGDP, MI, FDI, RMT and EXR are stationary after their first differences (i.e. I (1)) at 1% level of significance.

However, FPI is stationary at levels at 5% level of Significance (i.e. 1(0)).

ARDL Bounds Test Results

The results of the ARDL bounds tests for co-integration are presented in tables 4.3 and

Table 3: ARDL Bounds Test Result for Economic Growth Model

F-Bounds Test	Null Hypothesis: No Long-Run Relationship			
Test Statistics	Value	Significance	I(0)	I(1)
F-statistic	10.74746	10%	3.03	4.06
K	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72

Source: Author's computation from E-view 10.0.

From table 4.3, the computed F-statistic of 10.74746 is greater than the Upper
Bound critical value of 4.57 at the 5% level of significance. Based on this result, we reject the null hypothesis of no long-run relationship and therefore conclude that there exist long-run (equilibrium) relationship in the ARDL model for economic growth.

Table 4: ARDL Bounds Test Result for Misery Index Model

F-Bounds Test	Null Hypothesis: No Long-Run Relationship			
Test Statistics	Value	Significance	I(0)	I(1)
F-statistic	5.613102	10%	3.03	4.06
K	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72

Source: Author's computation from E-view 10.0

From the bounds test results in table 4.4, the computed F-statistic of 5.613102 is greater than the upper bound critical value of 4.57 at the 5% level of significance. Therefore, based on the above result, we reject the null hypothesis of no long-run relationships and hence, conclude that there exist long-run (equilibrium) relationships in the ARDL model for misery index.

ARDL Estimated Regression Results

It is important to note that the order of lag selection in the ARDL processes for the two models was automatically decided based on the Akaike Information Criterion (AIC).
The ARDL estimated long-run and short-run (ECM) regression results for the economic growth and misery index models are presented in tables 4.5 and 4.6 respectively.

Table 5: ARDL Estimated Long-Run and Short-Run Regression Results for Economic Growth Model

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(GRPCRGDP(-1))	-2.083033	0.537745	-3.873647	0.0305
D(GRPCRGDP(-2))	-2.377112	0.590540	-4.025318	0.0275
D(GRPCRGDP(-3))	-1.187838	0.305179	-3.892263	0.0301
DLOG(FDI)	1.810317	1.414592	1.279744	0.2906
DLOG(FDI(-1))	-10.985345	2.061760	-5.328140	0.0129
DLOG(FDI(2))	-10.675724	2.475570	-4.312430	0.0230
DLOG(FDI(-3))	1.394429	1.027802	1.356710	0.2679
DLOG(FPI)	-3.732928	0.886161	-4.212469	0.0244
DLOG(FPI(-1))	1.608359	0.414853	3.876941	0.0304
DLOG(FPI(-2))	2.101198	0.493891	4.254378	0.0238
DLOG(FPI(-3))	2.369090	0.414028	5.722052	0.0106
DLOG(RMT)	-7.529615	2.114484	-3.560970	0.0378
DLOG(RMT(-1))	0.969598	0.994837	0.974630	0.4016
DLOG(RMT(-2))	-1.932393	0.846849	-2.281862	0.1068
DLOG(RMT(-3))	0.534451	0.731524	0.730600	0.5179
D(EXR)	0.139479	0.025312	5.510464	0.0118
D(EXR(-1))	0.063253	0.033796	1.871609	0.1580
D(EXR(-2))	0.133779	0.055677	2.402771	0.0956
D(EXR(-3))	-0.087539	0.036161	-2.420789	0.0941
D(@TREND())	-2.230094	0.586583	-3.801838	0.0320
CointEq(-1)	-0.561321	0.545687	1.028650	0.0193
Cointeq = GRPCRGDP – (-58.979*LOG(FDI) + 18.9855*LOG(FPI) + 22.2885*LOG(RMT) -0.3917*EXR + 211.2471 + 3.9729*@ TREND)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDI)	-58.979680	51.971539	-1.134846	0.3389
LOG(FPI)	18.985527	16.047553	1.183079	0.3220
LOG(RMT)	22.288464	19.041160	1.170541	0.3263
EXR	-0.391716	0.392954	-0.996851	0.3923
C	211.247067	190.700015	1.107745	0.3488
@TREND	3.972938	4.177918	0.950937	0.4118

Source: Author's computation from E-view 10.0

In table 4.5 above, the short-run (i.e. error correlation model) result is presented in the upper panel while the long-run result is presented in the lower panel. From the short-run result in the upper panel of table 4.5, the error correction variable (i.e. cointEq (-1)) turned up with the correct negative sign.

It is also significant at the 0.05 level of Significance. In terms of magnitude, the coefficient of cointEq (-1) is -1.902481. This means a speed of adjustment of about 190%. It therefore follows that 190% of any disequilibrium in the short-run is reconciled to long-run stable equilibrium model of economic growth within a year.

Table 6: ARDL Estimated Long-Run and Short-Run Regression Results for Misery Index Model

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GRPCRGDP(-1))	-2.083033	0.537745	-3.873647	0.0305
D(GRPCRGDP(-2))	-2.377112	0.590540	-4.025318	0.0275
D(GRPCRGDP(-3))	-1.187838	0.305179	-3.892263	0.0301
DLOG(FDI)	1.810317	1.414592	1.279744	0.2906
DLOG(FDI(-1))	-10.985345	2.061760	-5.328140	0.0129
DLOG(FDI(2))	-10.675724	2.475570	-4.312430	0.0230
DLOG(FDI(-3))	1.394429	1.027802	1.356710	0.2679
DLOG(FPI)	-3.732928	0.886161	-4.212469	0.0244
DLOG(FPI(-1))	1.608359	0.414853	3.876941	0.0304
DLOG(FPI(-2))	2.101198	0.493891	4.254378	0.0238
DLOG(FPI(-3))	2.369090	0.414028	5.722052	0.0106
DLOG(RMT)	-7.529615	2.114484	-3.560970	0.0378
DLOG(RMT(-1))	0.969598	0.994837	0.974630	0.4016
DLOG(RMT(-2))	-1.932393	0.846849	-2.281862	0.1068
DLOG(RMT(-3))	0.534451	0.731524	0.730600	0.5179
D(EXR)	0.139479	0.025312	5.510464	0.0118
D(EXR(-1))	0.063253	0.033796	1.871609	0.1580
D(EXR(-2))	0.133779	0.055677	2.402771	0.0956
D(EXR(-3))	-0.087539	0.036161	-2.420789	0.0941
D(@TREND())	-2.230094	0.586583	-3.801838	0.0320
CointEq(-1)	-0.561321	0.545687	1.028650	0.0193
Cointeq = GRPCRGDP – (-58.979*LOG(FDI) + 18.9855*LOG(FPI) + 22.2885*LOG(RMT) -0.3917*EXR + 211.2471 + 3.9729*@TREND)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDI)	-58.979680	51.971539	-1.134846	0.3389
LOG(FPI)	18.985527	16.047553	1.183079	0.3220
LOG(RMT)	22.288464	19.041160	1.170541	0.3263
EXR	-0.391716	0.392954	-0.996851	0.3923
C	211.247067	190.700015	1.107745	0.3488
@TREND	3.972938	4.177918	0.950937	0.4118

Source: Author's computation from E-view 10.0

In table 4.6 above, the short-run result is presented in the upper panel while the long-run result is presented in the lower panel. From the short-run result in the upper panel of table 4.6, the cointEq (-1) term turned up with the correct negative. It is also significant at the 0.05 level of significance.

The coefficient of the cointEq (-1) is -0.807471. This means a speed of adjustment of about 80%.

Hence, 80% of any disequilibrium in the short-run is reconciled to long-run stable equilibrium model of misery Within a year.

Post Estimation Tests for the ARDL Models

The ARDL is a linear regression model. It therefore follows that the underlying assumptions of the classical linear regression model (CLRM) must be tested and satisfied. These assumptions include linearity homescelasticity, serial correlation, normality and stability. The results and decisions for these tests for our models of economic growth and misery index are presented in table 4.7.

Table 7: Post Estimation Tests Results

Tests for Economic Growth Model	Value	Prob.	Decision
Linearity (Ramsey Reset) Test			
t – statistic	0.828043	0.4179	Accept (Model correctly specified)
F – statistic	0.685655	0.4179	
Breusch- Godfrey LM Test			
F – statistic	0.095670	0.9092	Accept (No autocorrelation)
Heteroscedesticity (Glejser) Test (F – statistic)	0.976337	0.4970	Accept (Residuals have constant variance)
Normality (Jarque-Bera) Test			
F- statistic	1.402839	0.495881	Accept (Data normally distributed)
Tests for misery index model			
Linearity (Ramsey Reset) Test			
t – statistic	1.312237	0.2374	Accept (Model correctly specified)
F – statistic	1.721965	0.2374	
Breusch- Godfrey LM Test			
F – statistic	1.987772	0.1765	Accept (No autocorrelation)
Heteroscedesticity (Glejser) Test (F – statistic)	1.662973	0.1622	Accept (Residuals have constant variance)
Normality (Jarque- Bera) Test			
F – statistic	1.604491	0.448321	Accept (Data normally distributed)

Source: Author's Computation from E-view 10.0

Discussion of Findings

From the results presented in the previous sections, the behaviour of the variables in the models are discussed in this section.

Economic Growth Model

Estimated Long-Run Result

The result of the estimated long-run model of economic growth showed that foreign direct investment has significant positive impact on economic growth. Hence, 1 percent increase in the inflow of FDI, on the average, leads to 0.06519527 percent increase in the growth rate of per capita real gross domestic product.

Foreign portfolio investment has a significant positive impact on economic growth. In terms of magnitude, 1 percent increase in the inflow of FPI, on the average leads to 0.0252170 percent increase in economic growth.

Remittance has a weak negative impact on economic growth. Thus, 1 percent increase in the flow of remittances, on the average, brings about 0.00275908 percent decrease in economic growth.

Estimated Short-Run Result

From the short-run regression result for economic growth, economic growth lagged by one period has strong positive impact on economic growth in the current period. On the other hand, economic growth lagged by two periods has weak positive impact on economic growth in the current period. Foreign direct investment in the current period has weak positive impact on economic growth while its lags in the first and second periods have strong negative impacts on economic growth. Similarly foreign portfolio investment in the current period has weak positive impact on economic growth while its first and second lags have weak negative impact on economic growth. For remittances, its current value has weak negative impact on economic growth while its lagged values in the first and second periods have weak positive impact on economic growth.

Misery Index Model

Estimated Long-Run Result

From the estimated long-run result for misery index, foreign direct investment has a weak positive impact on misery index. Thus, one percent increase in the inflow of FDI, leads to 0.0324300 percent increase (deterioration) in misery index. On the other hand, foreign portfolio investment and remittances have weak negative impact on misery index. Hence, one percent increase in the inflows of FPI and remittances, lead to 0.03642366 percent and 0.05964922 percent decrease (improvement) respectively in the misery index.

Estimated Short-Run Result

The short-run regression result for misery index showed that misery index lagged by one period has strong positive impact on misery index in the current period. Also, foreign direct investment and foreign portfolio investment have weak positive impact on misery index. Thus, an increase in the inflows of FDI and FPI in the short-run, worsens misery index. Remittances in the current period has a weak negative impact on misery index while its lagged value in period one has strong negative impact on misery index. From the result of the study, our findings on FDI and economic growth in Nigeria support the findings of Okonkwo, Egbunike and Udeh (2015) [27] and Akanegbu and Chizea (2017) [2]. On the relationship between foreign portfolio and economic growth, our findings support the findings of Ibrahim and Akinbobola (2017) [19] and Ezeanyeji and Ifeako (2019) [17]. Our findings on the relationship between remittances and economic growth in Nigeria is in support of the findings of Onyeisi and Odo (2018) [30] but at variance with the findings of Olusuyi and Adebayo (2017) [29] and Loto and Alao (2016) [22].

Conclusions and Recommendations

Conclusions

Based on the results of the estimated models, the following conclusions were drawn from the study:

1. Foreign direct investment inflow has strong positive impact on economic growth in Nigeria.
2. Foreign portfolio investment inflows contribute significantly to the growth of the Nigerian economy.
3. Remittances have weak negative impact on economic growth in Nigeria.
4. Foreign direct investment insignificantly increases economic misery in Nigeria.
5. Foreign portfolio investment insignificantly reduces economic misery in Nigeria.
6. Remittances insignificantly reduces economic misery in Nigeria.

Recommendations

Based on findings from the study, we therefore give the following policy recommendations:

1. To attract sustained inflow of foreign capital, there is the need for improvement in the country's macroeconomic environment. To this end, sound monetary, fiscal and exchange policies should be implemented to reduce inflation, liberalize the foreign exchange market, and improve the ease of doing business in the country. Also, development of infrastructure in the areas of transportation, power and energy, tourism, etc. will help to improve the general business environment in the country, and thus, attract more foreign capital.
2. There is the need to reduce the general state of insecurity in the country so as to discourage the divestment of foreign investments. In this context, the fight against insurgency in the north-east should be intensified. Also, militancy in the Niger Delta region, kidnapping and other forms of armed banditry in several parts of the country should be curtailed to enhance the confidence of foreign investors in the economy.
3. There is the need to channel foreign capital inflows to preferred sectors of the economy. The government should identify sectors of the economy that are more likely to promote growth and create jobs (for example, the manufacturing and agricultural sectors), and then, attract and channel foreign capital into such sectors. To achieve this, the government should grant special fiscal incentives to foreign investors who are willing to invest in these sectors. Such incentives should include tax holidays, approved user scheme, import duty relief, export incentives, etc.
4. To stabilize FPI and reduce its vulnerability to capital volatility, the government and financial system regulatory authorizes should development and

implement sound policies that will enhance better performance of both the money and capital markets. In this context, policies that will deepen the financial system and promote sound and healthy baking system are necessary.

5. To improve the performance of remittances on the economy. The government should create an institutional platform through which recipients of remittances will be trained and encouraged to invest what they receive in productive and profitable ventures. Also, the government should encourage the routing of remittances through the banking system. This will help in channeling and efficiently allocating such resources to productive uses.

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