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The effect of remittances on economic growth of Nigeria

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Abstract

This study is conducted to investigate the impact of foreign remittances on economic growth of Nigeria using annual time series data from 1981–2019. The data used for the study were collated from the World Development Indicators of the World Bank. Economic growth was measured by real gross domestic product (RGDP) of Nigeria. In order to explore the effect of remittances on economic growth, multiple regression analysis based on the Autoregressive Distributed Lag (ARDL) model was utilized. From the ARDL bounds test, it was found that remittances and economic growth was bound by a long-run relationship. The long-run and short-run estimates showed that remittances had a negative and significant effect on economic growth in Nigeria after controlling for FDI, gross fixed capital formation, inflation and exchange rate. The study also revealed that FDI and gross fixed capital formation had a positive and significant effect on economic growth while inflation and exchange rate had a negative and significant effect on economic growth in the long-run. In the short-run, amidst negative and significant effect of remittances, FDI had a positive and significant effect on economic growth while gross fixed capital formation and inflation were found positive but insignificant and exchange rate having a negative and significant effect on economic growth of Nigeria. So, it was concluded that the effect of remittances is, though negative but significant in explaining the changes in economic growth of Nigeria.

1. Introduction

In recent years, remittances have been one of the largest sources of international capital inflows to developing economies as they account for approximately 27 percent of the gross domestic product (Bellaqa & Jusufi, 2020). The persistent increase in the flow of remittances to developing nations can be attributed to the improved immigration between the developed and the developing countries as well as the technological advancement that has enhanced the international transfer of payment between individuals at a low cost (Meyer & Shera, 2017). According to the World Bank, foreign remittances are personal transfers or compensation of workers. Olayungbo and Quadri (2019) noted that remittances constitute a prominent source of savings and capital for investments in health, education, and entrepreneurship thereby enhancing productivity and employment, which culminate into economic growth and poverty alleviation. Remittances can also aid the enhancement of financial sector growth on the notion that some of the remittances are converted and deposited with banks thus making the funds available for lending to the private sector and this, in turn, facilitate economic growth (Bashir, 2020). Remittances provide support for the welfare of the relatives left behind thus contributing to the eradication of poverty in the recipient country.

Inflow of remittances is an important source of foreign exchange earnings that affect economic growth positively by reducing current account deficit, improving the balance of payment position and reducing dependence on external borrowing (Meyer & Shera, 2017). Remittances can be transferred using two channels, namely formal and informal. Formal Channel involves major money transfer operators and banks. Some migrants use formal channels, but languages barriers and related costs for these services both deter migrant workers from using them. Hence, most remittances occur in informal channels (Chowdhury, 2015). The informal channels including *Hawala* or *Hundi* for money transfer or carrying cash home, tend to operate physical cash and is less expensive, it is swifter, more reliable and is more convenient than the formal channel. This reveals that the actual inflows of remittances are considerably more than those registered in official data sources. Remittance flows have proven to be a stable source of capital for developing countries because they are reliable source since they do not depend on the same external factors as other private capital flows (Buhari, Muhlis & Osman, 2018).

The influence of remittances on economic growth can be directly and indirectly as well as negative or positive. From the positive point of view, remittances increase the income and consumption of households and subsequently affect aggregate demand as well as economic growth positively by multiplier mechanism (Dilshad, 2013). Also, investments made with remittances affect economic growth indirectly by eliminating the negative impact of inadequate savings on economic growth partially. Moreover, remittances affect economic growth indirectly by reducing the volatility, since they do not exhibit too much volatility against changes in the economy relative to FDI inflows and portfolio investments. Furthermore, remittances affect economic growth indirectly by contributing to the development of financial sector (Giuliano & Ruiz-Arranz, 2005). On the other hand, remittances have had some negative effects on economic growth. The most accentuated negative effect of remittances on economic growth is Dutch disease. The Dutch disease impact of remittances is arisen by expenditure (Chowdhury, 2015).

The Nigerian economy is opened to the global space and to several sources of financial flows, which include export revenue, capital flows, remittances, official development assistance (foreign aid), loans, grants, foreign direct investment and so on. Among the developing countries, Nigeria receives reasonable amount of remittances from her indigenes in diaspora, she received $17.57 billion in direct diaspora remittances between January and November 2019 (Bamidele, 2020). This represents a 210% increase from $5.66 billion in 2010 to $17.57 billion as at November 2019. Despite the large inflows of remittances into Nigeria, economic growth is still sluggish.

Nigeria is the leading recipient of remittances in Africa, with implications that more Nigerians are resident outside the country compared to other African countries. This is an indication of the underdeveloped state of the economy, the prevalent lack of opportunities and underemployment (Loto & Alao 2016). This is a situation known as brain drain, involving the exodus of skilled/trained/professional manpower in search of greener pastures. Could there be any appreciable gain from this phenomenon called brain drain? This can be asserted by examining the impact of remittance inflows on the Nigerian economy. Despite huge remittances received by the country, the problems of poverty, unemployment and inequality still persist and indication that Nigeria may not have efficiently utilized the gain from brain drain in terms of remittances (Adeagbo & Ayansola, 2014). Moreover, the bad economic situation of Nigerian citizens made most of the recipients of remittances to consume instead of investing them.

Researchers have found both positive and negative impacts of remittances on economic growth (Ari, 2020; Buhari, Muhils & Osman, 2018; Chowdhury, 2015). Also, there are studies that show that no impact of remittances on economic growth (Barajas, Chami, Fullenkamp, Gapen & Montiel, 2009). So, there is no conclusive answer regarding the impact of remittances on economic growth as the situation of contrasting findings possibly results from multiple channels through which remittances can affect economic growth,

geography and economic situations of different countries, methodology and time period. Studies by Ari (2020); Olayungbo and Quadri (2019) stated that the impact of remittances depends on a country's socioeconomic conditions, and the channels through which this impact of remittances on economic growth manifests itself are complex and are likely to be country-specific (Giuliano & Ruiz-Arranz, 2005). It is needful to find out which factors shape this impact so that this process could be properly adjusted. Special attention is usually paid to the financial development of the country (Chowdhury, 2015). This study provides insight about the effect of remittances on long-run growth.

2. Literature Review

2.1. Linkages between Remittances and Economic Growth

The literature identifies various channels through which remittances have an impact on economic growth. Remittances promote economic growth by increasing household income (Giuliano and Ruiz-Arranz, 2005). Increasing income creates the opportunity to boost consumer spending, accumulation of assets, promotion of self-employment, and investment in small business. Moreover, emigration and remittances contribute to human capital accumulation (Karagoz, 2009). A positive impact of emigration on growth is more likely in developed countries, which usually have a higher ability to transfer knowledge and skills when emigrants return to the country of origin, or to divert remittances in order to create new opportunities in the private sector. A negative impact of emigration results if the developing countries of origin suffer from brain drain and start to depend on remittances (Fayissa, 2014). There are some studies that analyze whether the level (measured as remittances-to-GDP ratio) and growth of remittances are related to a higher level of economic growth (Bashir, 2020). Estimations of economic relationships in a non-remittance-dependent setting model show that remittances have a positive impact on GDP growth, but these results are sensitive to the selection of explanatory variables.

At the macroeconomic level, the impact of remittances occurs within the multiplier effect through a household's consumption of goods and services; investment in human capital, which improves labour productivity; and investment in gross capital formation. Despite the positive impact of remittances, they cannot ensure long-run economic growth or solve structural economic problems, such as unstable political climate and economic policies, or corruption, which is common in developing countries (de Haas, 2007). Some studies found that remittances influence economic growth in less developed countries because they fill the gap of foreign currency shortage (Javid, Arif & Qayyum, 2012). The other reason for a positive impact is that remittances provide an alternative way to finance investments and help overcome liquidity constraints (Fayissa, 2014).

Only by ensuring the stable political and economic environment of the receiving country can remittances ensure economic growth, because this money will be used not for personal consumption, but for investment in productive activities or business. The impact of remittances on the country's economic growth depends on the financial system and the financial market development, as well as on the specific economic conditions in the receiving country. Remittances may affect economic growth by decreasing volatility, because remittances do not exhibit too much volatility against changes in the economy. Giuliano and Ruiz-Arranz (2005) found that remittances are typically pro-cyclical for the remittance-receiving country, while de Haas (2007) found that they are typically countercyclical.

Remittances promote additional expenditures in the country, and this influences the opportunity to invest more (Cornnel & Conway, 2000). Remittances are the source of foreign currency, encouraging higher savings and economic growth (Dilshad, 2013). If remittances create a higher demand than the country is able to meet, they also increase imports, which create a variety of goods and services. In this case, it worsens the prosperity of households that do not receive remittances (Karagoz, 2009). The impact of remittances on economic growth is relatively sensitive to country-specific conditions, through which the effects of remittances are differentiated in size and possibly in nature. The impact of remittances depends highly on public policy, controlling the flow of remittances and creating a favourable environment for the use of remittances in productive investment.

2.2. Theoretical Review

2.2.1. Developmental Pessimistic View

In the late 1960s a new viewpoint regarding remittances, migration and development emerged; the pessimistic view. The theory arose from a shift in social science towards more structural views (de Haas, 2007). Furthermore, empirical studies from that time showed results that gave support for the pessimistic view (Taylor, 1999). This theory suggests that the net effect of migration and remittances does not foster sustainable development (Adenutsi, 2010). The brain drain is one of the aspects considered, where emigration of the educated leads to a loss that is not offset by the benefits associated with remittances. The developing countries are drained of their human capital resources when educated inhabitants emigrate.

Moreover, this theory implies that the poorest do not have enough money to emigrate because of the costs associated with emigration, such as traveling costs (de Haas, 2007). This would mean that remittances could increase the income gap in developing countries even further. Also, it is argued that remittances would not be spent on developing enhancing investment, as the optimistic view would imply. If the aim, when remitting, is to invest in the receiving country it means that the recipients makes the investment decisions on behalf of the sender. The recipient might not be as skilled as domestic financial intermediaries; therefore, the investment is less likely to be successful. Money would rather be spent on consumption or non-productive investments such as real estate and rarely in productive enterprises (Adenutsi, 2010).

2.2.2. Developmental Optimistic View

The Developmental Optimistic view dominated during the 1950s and 1960s. According to this view migration leads to "North-South" transfers of investment capital and means an acceleration of the labour exporting countries exposure to "liberal, rational and democratic ideas, modern knowledge and education" (Adenutsi, 2010). The general assumption the followers of this theory make is that flows of remittances as well as experience, skills and knowledge that migrants acquire abroad will enhance development in the recipient countries (de Haas, 2007). Especially the take-off in economic sense is expected to thrive because migrants would be expected to invest great capital into enterprises in the countries of origin.

The Neoclassical economists also put migration into a positive light. In the Neoclassical model of balanced growth, migration is a process contributing to optimal allocation of production factors, which benefit all equally, both the countries of origin and the recipients. In an unconstrained market environment, free labour mobility will lead to scarcity of labour, and hence the marginal productivity of labour will increase and lead to higher wages in the migrant sending countries. Moreover, this would mean that the marginal productivity of capital would go down and capital flows are thereby expected to move in the opposite direction as migration. The core of this theory is that the developmental role of migration depends strictly on the process of factor price equalization. However, de Haas (2007) points out that the neoclassical migration theory does not include remittances in their analysis.

2.2.3. The Developmental Pluralistic View

The Developmental Pluralistic View arose in the 1980s and 1990s. This theory holds the view that both above theories are too static (Adenutsi, 2010; de Haas, 2007). According to this approach there are not strictly negative nor positive outcomes of remittances in the remittance receiving countries, the issue is more complex. There is a need for new theories regarding the multiple ways, in which remittances could affect the recipient economies, to be able to understand the complex relationship between migration and development (Taylor, 1999). The pluralistic view aims to link causes and consequences of migration more explicitly, in which both positive and negative effects on development are possible. They argue that because of the complexity of remittances and development, there is a need of more dynamic understanding of the relationship between them. Neither the optimistic nor the pessimistic view provides this (Adenutsi, 2010). According to this theory the fundamental question is not whether migration has a strictly negative or positive impact on development, the effects of remittances are thus context-dependent (Taylor, 1999). No overarching theory can be applied to, and explain, every outcome.

2.3. Empirical Review

Bellaqa and Jusufi (2020) carried out a study on management of remittances and their role in Economic development in Kosovo (2009-2018). The study's main objective was to analyze the impact of remittances on economic growth. Correlational analyses were used to measure the strength of the relationship between remittance and Gross Domestic product and the findings revealed the existence of positive average correlation between remittances and Gross Domestic product of Kosovo.

Ari (2020) carried out a study on the impact of remittances on economic growth in developing countries: Empirical evidence from Turkey using data from 1994 to 2018. The data were analyzed using Johansen cointegration and Granger causality test. The findings showed that there is a unidirectional relationship from economic growth to remittances. Also, remittance flows into Turkey did not cause economic growth.

Samuel and Pierre (2020) used ARDL bound test estimation techniques annual time series of Senegal from 1980-2018 to explore the nexus between migrant remittances and Economic Growth in Senegal. The estimates show a negative relationship between remittances and economic growth and an insignificant effect in the long run, while the nexus between economic growth and investment is positive in the long term.

Sutradhar (2020) investigated the impact of workers' remittances on economic growth of four South Asian emerging countries by employing balanced panel data from 1977 to 2016. Pooled OLS, fixed effects, random effects and dummy variable interaction models were used to estimate the impact of remittances. The empirical

regression analysis confirms a negative effect of remittances on economic growth in Bangladesh, Pakistan and Sri Lanka. Conversely, remittances have a positive impact on economic growth in India. This study also indicated a joint significant and negative relationship between remittances and economic growth in four countries.

Uddin, Uddin, Uddin and Ahmmed (2020) used a panel data of five (5) South Asian countries from 1975-2017 they carried out a study on Remittances and Economic Growth Tie in Selected South Asian Countries: The data were analyzed using Panel Data Analysis, Granger-causality tests and Dumitrescu Hurlin Causality tests. The findings revealed that remittances have significant positive impact on GDP per capita of the countries.

Mehedintu, Soava and Sterpu (2019) analyzed the evolution and trends of the share of remittances in gross domestic product (GDP) and the influence of migration on remittances in Romania. The analysis on data from Eurostat over 2008–2017 has three components: a statistical analysis, an estimation of evolution of indicators, and an estimation of impact of migration on remittances, using polynomial-time regression and difference equation models, respectively. The results showed that GDP and GDP/capita had a permanent increase, meaning an improvement in the standard of living in Romania, while the other indicators had an evolution with a period of sharp decline triggered by the global crisis, followed by a slow growth.

Morad and Adel (2019) carried out a study on remittances and economic growth in a Small and Volatile Economy using data from 1976-2016. The data were analyzes using ARDL and the findings revealed that Jordanian workers; remittances had no significant impact on economic growth nor financial development, because large portion of the remittances was channeled towards consumption instead of savings and investment.

Olayungbo and Quadri (2019) investigated the relationship among remittances, financial development and economic growth in a panel of 20 sub-Saharan African countries over the period of 2000 and 2015. The study used both Pooled Mean Group and Mean Group/ARDL estimations with panel unit root and cointegration tests. After establishing cointegration, remittances and financial development were found to have positive effects on economic growth both in the short and the long run. The interactive term showed that financial development acted as a substitute in the remittances-growth relationship. Finally, unidirectional causal relationships were found to exist from GDP to remittances and from financial development to GDP.

Anetor (2019) examined the relationship between remittances, financial sector development, and economic growth in Nigeria over the period 1981 to 2017. The study used the autoregressive distributed lag (ARDL) model to analyze the long-run and short-run relationships between the variables. The outcome of the study revealed that the variables are bound together in the long-run. The results also showed that remittances had a negative and significant effect on economic growth both in the long-run and short-run.

Khan, Teng and Khan (2019) used ARDL to study the effect of remittance inflow on Pakistan's economy over the period 1976–2016. The results indicated that remittance inflow, foreign direct investment, and the gross domestic saving have a positive effect on the economic growth of Pakistan in the long-term, while inflation and consumption have a negative effect on the economic growth of Pakistan in the long-term.

Buhari, Muhils and Osman (2018) studied the nexus between income inequality, remittances and economic growth in Turkey using the annual data for 1977-2014. The ARDL method and Granger causality tests were used for analysis. The empirical findings of the research suggested that the series were cointegrated and they move together in long-term. Also, income inequality and international remittances contribute to economic growth both in the long and short-term. The results of the Granger causality test showed that there was a unidirectional causality running from economic growth to remittances and from remittances to income inequality.

Meyer and Shera (2017) observed the impacts of remittances on economic growth, using panel data set of six high remittances receiving countries, Albania, Bulgaria, Macedonia, Moldova, Romania and Bosnia Herzegovina during the period 1999–2013. These countries have experienced a major increase in remittance inflows, and at this time accounts for the bulk of total remittance receipts, compared with other regions. Most countries, remittances represent the largest source of foreign exchange earnings and represent more than10 percent of GDP. In other words, the econometric analysis was based on those six remittances receiving countries. The paper was then to review the empirical literature devoted to the impact of remittances on economic growth, in order, to identify empirically if there are significant relationships between remittances and growth in these countries. The results suggested that remittances had a positive impact on growth and that this impact increases at higher levels of remittances relative to GDP.

Matuzeviciute and Butkus (2016) used an unbalanced panel data covering a sample of 116 countries with different development levels over the period 1990–2014, we studied the interaction between remittances and the level of economic development, as well as its impact on long-run economic growth—because the impact of remittances could be influenced by the development level of the receiving countries. In parallel, we explored the hypothesis about diminishing a country's capacity to use remittances for promoting long-run economic growth

as the abundance of remittances increases. To control the endogeneity while estimating the impact of remittances on long-run economic growth, OLS (ordinary least squares) was used with FD (first differences) transformation and FE (fixed effects) approaches and other controls of long-run growth. The results showed that in general remittances have a positive impact on long-run economic growth, but the impact differs based on the country's economic development level and the abundance of remittances in the economy.

Loto and Alao (2016) investigated the contributions of foreign remittances on economic growth in Nigeria from 1980 to 2016, using the Vector error correction modelling (VECM) technique to analyze the data. The findings revealed that migrant remittances had positive and significant impact on economic growth while workers remittances had negative and significant impact on economic growth.

Karamelikli and Bayar (2015) carried out a study on the relationship between economic growth, remittances, foreign direct investment inflows and gross domestic savings in Turkey during the period 1974-2013 by employing cointegration test based on ARDL approach. The findings showed that remittances, foreign direct investment and gross domestic savings had positive impact on economic growth.

Chowdhury (2015) used pooled cross-country times series for the time period 1981-2010 to investigate the impacts of remittances and other economic growth determinants on economic growth of low-income, lower-middle income, and upper-middle income economies. This study divided this 30-year period into six non-overlapping five-year periods. The research found that remittances are not associated with the economic growth of low-income economies.

3. Methodology

The research used *ex-post facto* research design approach. This is because, the researcher does not aim to control any of the variables under investigation and pre-disposition is to observe occurrence over a period of time (1981-2019). Another justification for the research design is the desire of the researcher to use secondary data to analyze the relationship existing between the variables under consideration. These are already existing data, thus, cannot be manipulated by the researcher. The data used for this study are secondary comprising annual times series sourced from World development indicators.

This study adapted the econometric model of Khan *et al.* (2019) to explore the effect of remittances on economic growth of Nigeria. The model is stated, thus;

$$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXC_t + \beta_3 INF_t + \beta_4 REM_t + \beta_5 GDS_t + \beta_6 CONS_t + \mu_t \quad (3.1)$$

Where,

GDP is the nominal gross domestic product,

FDI is foreign direct investment,

EXC represents exchange rate,

INF denotes inflation,

REM is remittances,

GDS is the gross domestic saving, and

CONS represent consumption

The above model was modified by replacing nominal GDP with real GDP because real GDP measures the extent of economic growth and stability since it represents the inflation adjusted gross domestic product. Also, CONS and GDS were replaced with gross fixed capital formation (GFCF) to capture the level of investments in the Nigerian economy. Consequently, the model applied in this study is as specified in equation (3.2) below:

$$RGDP_t = \beta_0 + \beta_1 REM_t + \beta_2 FDI_t + \beta_3 INF_t + \beta_4 GFCF_t + \beta_5 EXR_t + \mu_t \quad (3.2)$$

Where,

REM = Remittances

FDI = Foreign direct investments

INF = Inflation

GFCF = Gross fixed capital formation

EXR = Exchange rate

β_0 is the constant

β_1-β_5 = coefficients

t is an indicator for the period

μ_t is the error term

The model variables were selected based on established theoretical relationships among them, their use in previous studies and availability of data. These variables have been described below as follows:

Real GDP (RGDP): This is the dependent variable. It is a measurement of economic output that accounts for the effects of inflation. Hence, it provides a more realistic assessment of growth than nominal GDP. Without RGDP, it could seem like a country is producing more when it is only that prices are rising.

Remittances (REM): REM is the major independent variables used for the study. It refers to a transfer of money from a foreign worker to their family or other individuals in their home countries. In many countries, especially low-income countries, remittances constitute a significant driver of economic growth.

Foreign direct investment (FDI): This is another independent variable included in the model. It is an investment made by a firm or individual in one country into business interests located in another country. FDI takes place when an investor establishes foreign business operations or acquires foreign business assets in a foreign country.

Inflation (INF): INF refers to the rise in prices of goods and services. It measures the average price change in a basket of commodities and services overtime.

Gross fixed capital formation (GFCF): GFCF consists of resident producers' investments, deducting disposals, in fixed assets during a given period. It also includes certain additions to the value of non-produced assets realized by producers.

Exchange rate (EXR): EXR is the rate at which one currency is exchanged for another. It is also regarded as the value of one country's currency in relation to another currency. A fall in the value of a country's currency in terms of the US Dollar could reduce its demand, hence decline in economic growth.

The study used autoregressive distributed lag (ARDL) bounds test approach for the study. The bounds testing was used to determine if the long-run relationship between the variables in the model. If the variables are cointegrated, the long-run ARDL model will be estimated and also the speed of adjustment will be found. In ARDL analysis, long-run and short-run coefficients are estimated simultaneously, and model could be developed and utilized for cointegration test even if all the variables were not stationary after first differencing 1(1), or at level i.e. 1(0). ARDL model is used when the variables are of mixed integration at order one, 1(1) and at level, 1(0), but none is integrated at second differencing, 1(2) (Pesaran *et al.*, 2001). The ARDL bounds testing specification of equation (3.2) was expressed as error correction mechanism (ECM) to test for cointegration between the variables in view:

$$\Delta RGDP_t = \delta_o + \sum_{i=1}^{p} \delta_1 \Delta RGDP_{t-i} + \sum_{i=0}^{p} \delta_2 REM_{t-i} + \sum_{i=0}^{p} \delta_3 FDI_{t-i} + \sum_{i=0}^{p} \delta_4 INF_{t-i} + \sum_{i=0}^{p} \delta_5 GFCF_{t-i} + \sum_{i=0}^{p} \delta_6 EXR_{t-i} + \beta_1 \Delta RGDP_{t-1} + \beta_2 REM_{t-1} + \beta_3 FDI_{t-1} + \beta_4 INF_{t-1} + \beta_5 GFCF_{t-1} + \sum_{i=0}^{p} \delta_5 EXR_{t-i} + \mu_t \quad (3.3)$$

After cointegration is established, the estimation of the long-run relationship would follow, thus:

$$\Delta RGDP_t = \delta_0 + \beta_1 RGDP_{t-1} + \beta_2 REM_{t-1} + \beta_3 FDI_{t-1} + \beta_4 INF_{t-1} + \beta_5 GFCF_{t-1+} \sum_{i=0}^{p} \delta_6 EXR_{t-i} \ \mu_t \quad (3.4)$$

The short-run relationship is estimated using an error correction mechanism as shown in equation (3.5):

$$\Delta RGDP_t = \delta_o + \sum_{i=1}^{p} \delta_1 \Delta RGDP_{t-i} + \sum_{i=0}^{p} \delta_2 \Delta REM_{t-i} + \sum_{i=0}^{p} \delta_3 \Delta FDI_{t-i} + \sum_{i=0}^{p} \delta_4 \Delta INF_{t-i} + \sum_{i=0}^{p} \delta_5 \Delta GFCF_{t-i} + \sum_{i=0}^{p} \delta_6 EXR_{t-i} + \theta ecm_{t-i} + \mu_t \quad (3.5)$$

Where,

δ_0 = Constant

δ_1 - δ_6 = short-run elasticities (coefficients of the first-differenced explanatory variables)

β_1 - β_6 = long-run elasticites (coefficients of the explanatory variables)

θ = Speed of adjustment

ecm_{t-i} = Error correction term lagged for one period

Δ = First difference operator

p = Lag length

Prior to ARDL estimation, the time series data was tested for stationarty. The test for stationarity of data was carried with Augmented Dickey Fuller (ADF) unit root test (Dickey and Fuller, 1979). This particular stage is very necessary, because most macroeconomic time series contains unit root and any regression involving non-stationary series almost always produce significant relation where in fact no relationship exist between the variables. The general model for Augmented Dickey-Fuller unit root test could be represented, thus:

$$\Delta y_t = \beta_0 + \beta_{1t} + \beta\lambda y_{t-1} + \sum_{j-1}^{p} \delta_j \Delta y_{t-j} + \mu_t \quad (3.6)$$

Where,

y_{t-1} = Lagged value of y_t at first difference

Δy_{t-j} = A change in lagged value

δ = Measure of lag length

Δy_t = First difference of y_t

μ_t = Error term

4. Analysis and Discussion

4.1. Unit Root Test

Before analyzing the estimation, there is need to check the time series properties of the variables. This was done in order to correctly apply the ARDL which is suitable for purely I(0) and purely I(1) variables and not for I(2) variables (Pesaran, Shin and Smith, 2001). In other words, Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) tests for unit root were performed. The unit root test results are presented in Table 4.1:

Table 4.1. Unit root test results

Variable	ADF @ level	PP @ level	ADF @ I(1)	PP @ I(1)	Remark
Log(RGDP)	-3.174547 {0.1047}	-3.089470 {0.1233}	-4.592025 {0.0039}***	-4.559618 {0.0043}***	I(1)
Log(REM)	-1.981511 {0.5924}	-2.179227 {0.4870}	-6.233173 {0.0000}***	-6.233173 {0.0000}***	I(1)
Log(FDI)	-3.242786 {0.0916}	-3.331293 {0.0766}	-10.11383 {0.0000}***	-10.12774 {0.0000}***	I(1)
Log(INF)	-4.436434 {0.0059}***	-3.271640 {0.0234}**	--	--	I(0)
Log(GFCF)	-0.662057 {0.9688}	-1.121646 {0.9119}	-3.931283 {0.0205}**	-3.813819 {0.0269}**	I(1)
Log(EXR)	-1.252519 {0.8845}	-1.251678 {0.8847}	-5.608917 {0.0003}***	-5.808089 {0.0001}***	I(1)

Source: EViews 10.0

Note: Figures in brackets "{ }" are the p-values while *** and *** denote significance at 1% and 5% respectively.

Table 4.1 shows the outcome of the Augmented Dickey-Fuller (ADF) and the Phillip-Peron (PP) unit root tests. From the results, it can be seen that the p-values of INF for both the ADF and PP tests were less than 0.05 at level while other were less than 0.05 at first difference. This implies that the null hypothesis of "no unit root" was rejected for INF at level while the other variables achieved stationarity at first difference. Thus, the results indicate that the variables are stationary at level and first difference; hence, the ARDL method of estimation becomes more appropriate for the estimation of the long-run and short-run relationship between remittances and economic growth.

4.2. ARDL Estimation

Table 4.2 indicates the outcome of the ARDL bounds test. The significance of the test is to determine whether there is a long-run relationship between the variables. The result of the test indicates that the F-statistic (9.577671) and it is larger than the upper bound critical value at 1 per cent (4.15) and 5 per cent (3.38) levels of significance. Hence, the null hypothesis of "no cointegration" is rejected while the alternate hypothesis of the presence of cointegration cannot be rejected. This suggests that a long-run relationship exists between the variables understudy.

Table 4.2. ARDL bounds test results

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.577671	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: EViews 10.0

The long-run estimates of the ARDL model are reported in Table 4.3 below. The long-run coefficients indicate that remittances (REM), inflation (INF) and exchange rate (EXR) exerted negative and significant effect on real GDP (RGDP) while foreign direct investment (FDI) and gross fixed capital formation (GFCF) has positive and significant effect on RGDP. The significance of the coefficients was adjudged based on the respective p-values that are less than 5 per cent (0.05) level. As a result, the null hypothesis (H_0), which states that remittances, FDI, INF, GFCF and EXR do not have a significant effect on economic growth, is rejected. In simple words, this means that increase in the flow of remittances in Nigeria, inflation and exchange rate will cause RGDP will decrease while increase in FDI and GFCF helped RGDP to increase.

Table 4.3. Long-run coefficients of estimated ARDL model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(REM)	-0.329689	0.083989	-3.925399	0.0005
LOG(FDI)	0.649880	0.097047	6.696547	0.0000
LOG(INF)	-0.186355	0.089332	-2.086098	0.0459
LOG(GFCF)	1.190013	0.194495	6.118480	0.0000
LOG(EXR)	-0.505732	0.116556	-4.338940	0.0002
C	-12.54500	4.391957	-2.856358	0.0078

Source: EViews 10.0

Having estimated the long-run relationship, Table 5 below shows the short-run relationship between the variables and the speed of adjustment. The short-run coefficients reveal that remittances (REM) has a negative and significant effect on RGDP. FDI has a positive and significant effect on RGDP in the short-run. INF and GFCF exerts a positive and insignificant effect on RGDP in the short-run. On the other hand, EXR has a negative and insignificant effect on RGDP. The results imply that increase in REM and EXR lowered economic growth while FDI, INF and GFCF caused economic growth to increase in the short-run.

The ECM(-1), that is, the error correction term explains how quickly or slowly in which the relationship is restored to its equilibrium path. The coefficient of the ECM(-1) is expected to be negative and must be statistically significant. A significant error correction term proofs the existence of a stable long-run relationship. Table 4.4 reveals that the ECM(-1) is -0.384089 and it is statistically significant. This indicates that deviation from the long-run path is corrected by approximately 38 per cent over the following year. The Adjusted R-squared of 0.672818 shows that the explanatory variables collectively explained approximately 67 per cent changes of the total variations in RGDP. The F-statistic, which indicates the overall significance level of the estimate, showed that the overall estimate is significant as the p-value is less than 5 per cent (0.05). The Durbin Watson statistic of 2.113933 is approximately 2, thus indicating the absence of first-order serial autocorrelation.

Table 4.4. Error correction representation of the ARDL model

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-4.818400	0.547064	-8.807743	0.0000
DLOG(REM)	-0.476604	0.175544	-2.715008	0.0188
DLOG(FDI)	0.165433	0.033897	4.880416	0.0000
DLOG(INF)	0.041102	0.026661	1.541637	0.1491
DLOG(GFCF)	0.081550	0.099769	0.817393	0.4204
DLOG(EXR)	-0.719519	0.324340	-2.218412	0.0466
ECM(-1)*	-0.384089	0.043442	-8.841441	0.0000
R-squared	0.699346			
Adjusted R-squared	0.672818			
F-statistic	26.36230			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	2.113933			

Source: EViews 10.0

The diagnostic tests of the ARDL estimates are reported in Table 4.5 and Figure 1. The purpose of the diagnostic tests is to determine whether the underlying ARDL model fits very well and is well specified. For the Breusch–Godfrey serial correlation and Breusch-Pagan -Godfrey heteroskedasticity tests, the following hypothesis were stated:

Hypothesis:

H_o: There is no autocorrelation and heteroskedasticity problem.

H_1: There is an autocorrelation and heteroskedasticity problem.

Significance Level: $\alpha = 5\%$ or 0.05

Decision Rule**:** Reject H_o if the p-value is less than α. Otherwise, do not reject H_o

The result indicates that the ARDL model passed all diagnostic tests of Breusch– Godfrey test serial correlation and Breusch-Pagan -Godfrey heteroskedasticity test.

Table 4.5. Diagnostic tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.495133	Prob. F(2,27)	0.2422
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.318846	Prob. F(8,29)	0.2735

Source: EViews 10.0

The most widely used method for testing whether the distribution underlying a sample is normal is Jarque-Bera Normality nest. The outcome of the normality test has been presented in Figure 1.

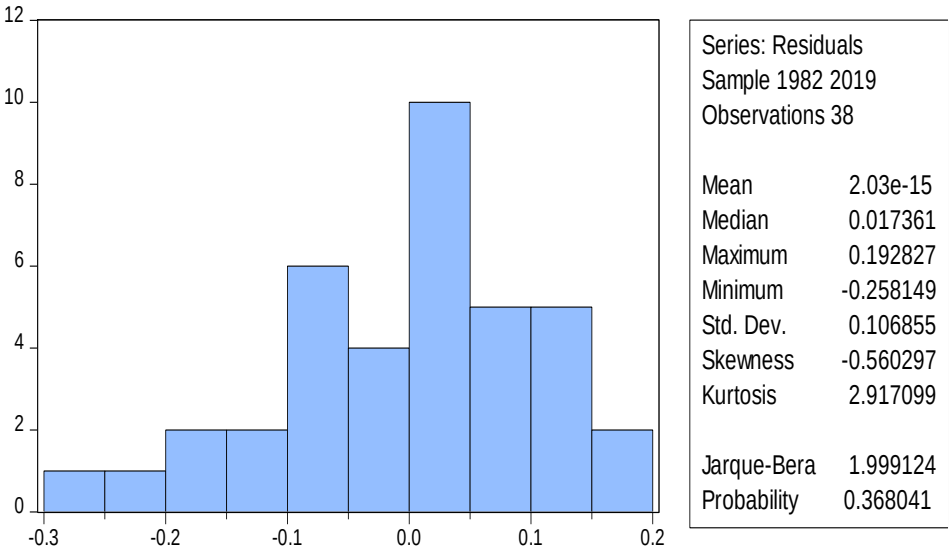

Figure 1. Jarque-Bera test for normality of errors

Hypothesis:

Ho: Error term is normally distributed.

H_1: Error term is not normally distributed.

Significance Level: $\alpha = 5\%$ or 0.05

Decision Rule: Reject H_o if p-value is less than α. Otherwise, do not reject H_o

The results of the normality test (see Figure 1) shows that p-value (0.368041) is greater than 5 per cent level of significance. This implies that the null hypothesis that the error term is normally distributed is not rejected at 5 per cent significance level. Hence, it is concluded that the residuals of the ARDL model is normally distributed.

The CUSUM and CUSUMSQ tests were conducted as plotted in Figures 2 and 3 respectively. The essence of these tests is to determine whether the ARDL estimates are stable. If the cumulative sums remain within the red lines, it means that the model is fit for the data. Since, both graphs reveal that the cumulative sums are within the red lines, it then implies that the data are fit for the ARDL model.

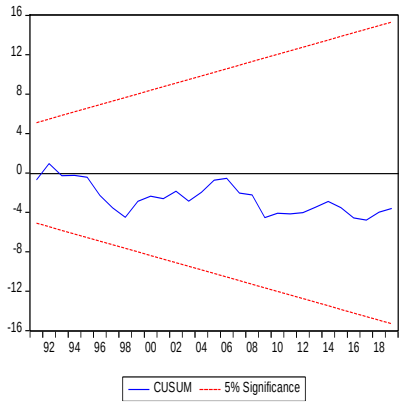

Figure 2. CUSUM test

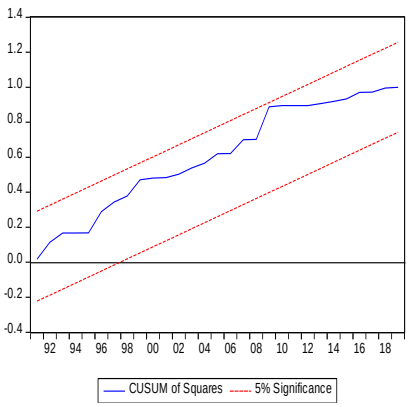

Figure 3. CUSUMSQ test

4.3.1 Discussion of Findings

An interesting finding from the analysis of data is that remittances (REM) exerted negative and significant economic growth of Nigeria in both the long-run and short-run. This falls in line with Anetor (2019) who argued that remittances undermine productivity in low-income countries because they are often spent on consumption likely to be dominated by foreign goods than on productive investments. Similarly, Fayissa (2014) adduced the negative effects of remittances on economic growth to the fact that a significant proportion of remittances are spent on consumption; a smaller part of remittances goes into saving and/or investments; and that remittances are typically saved or invested in housing, land and jewelry, etc. which are not necessarily productive to the overall economy. From another perspective, the results that exchange rate had negative and significant effect on economic growth can alter the domestic value of foreign remittances which further affect the growth rate of the economy (Olayungbo & Quadri, 2019).

On the other hand, empirical studies abound that remittances still represent a relatively stable financial resource in many countries. Mehedintu et al. (2019) concluded that remittances increased the consumption level of rural households, which might have substantial multiplier effects on the economy, because they are more likely to be spent on domestically produced goods emerging countries in Europe. Similarly, Chowdhury (2015) averred that remittances are positively and significantly related to economic growth of Lower Middle-Income and Upper Middle-Income Economies. Also, Bashir (2020) explained that remittances are likely to increase the quantity of funds flowing through the banking system which may lead to enhanced financial development and thus high economic growth through increased economies of scale in financial intermediation and political economy effect; whereby a larger constituency (depositors) is able to pressure the government into undertaking beneficial financial reform. This implies that remittances might ease the immediate budget constraint of families by boosting crucial spending needs on food, healthcare and schooling.

5. Conclusion and Recommendations

This study focused on the effect of remittances in the economy of Nigeria from 1981 to 2019. To achieve this objective, the ARDL technique was applied. From the results and findings, it was concluded that remittances do significantly but negatively affect the economic growth of Nigeria. After further analysis, it was realized that that the negative and significant effect of remittances persisted in the long-run and short-run. This implies that remittances are neither a panacea for economic growth in Nigeria. Additionally, in the long-run, the results showed that the conventional sources of economic growth such as FDI and capital formation can spur economic growth in Nigeria while increase in exchange rate and inflation caused economic growth to decline.

Policy implications drawn from this study is as follows:

a) As remittances are yet to foster economic growth in Nigeria because a large fraction of them are spent on consumption instead of economically productive investments, policy makers should create investment vehicles like diaspora bonds among others, to encourage the citizens of Nigeria working abroad to lend their hands to national development.

b) As effort is being made to harness the potentials of remittances in economic growth, Nigeria can continue to improve its economy creating an attractive economic outlook that would appease foreign investors. This will help generate investment inflows through FDI, hence higher economic growth.

c) Also, the government should stimulate remittances by ensuring that funds transfers by nationals living and working abroad does not lose its value to inflationary pressure in Nigeria. Consequently, monetary authorities should strategically identify the underlying causes of such inflationary pressures and use the appropriate policy to curtail it so as to foster price stability and economic growth in Nigeria.

d) Again, it is imperative for the Nigerian government, through the Central Bank, to develop a policy framework that would foster capital formation thus making long-term funds available for economic production since remittances are not to drive economic growth and development in Nigeria.

e) Since the effect of exchange rate on economic growth was negative and significant, it is needful that monetary authorities sustain the utilization and management of floating exchange rate in Nigeria to enhance economic activities which would also lead to higher economic growth.

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