

## INTERNATIONAL REMITTANCES AND ECONOMIC GROWTH OF NIGERIA

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### ABSTRACT

The paper investigated the effect of international remittances on the economic growth of Nigeria for the period covering 1986 to 2017. In analysing the data collected the ARDL approach to co-integration and VECM was adopted in determine the long run and short run relationships among economic growth, remittances, gross domestic investment, Interest rate and inflation rate. Findings indicated that in the long run remittances, human capital and inflation rate had positive effect while GDI and interest rate had negative effect on the economic growth of Nigeria. In the short run remittances, human capital, GDI and inflation rate had positive effect while interest rate had negative effect on the economic growth of Nigeria. Inveiw of the findings the study amongst others recommend that Government should put in place facilities and incentives that will make remittances cheaper using the formal channel, also the introduction of new savings instruments as well as providing information on investible opportunities available in Nigeria will ensure remittance are put into productive use. The creation and functioning of the Migrants and Diaspora Office domiciled in the Ministry of Foreign Affairs will serve as a fulcrum in stepping up remittances.

**Key Words:** Remittances, Economic growth, ARDL cointegration, Investment, and Nigeria.

### INTRODUCTION

The world is becoming a global village, with the concept of globalization having a firm grip on the world; easy migration is the resultant effect. International migration has turned into a veritable measure adopted by persons families and communities from mostly less developed countries like Nigeria in order to survive and overcome the harsh then unfavourable economic realities manifested in high level of poverty and economic uncertainty. After the recent global recession occasioned by the global financial downturn, the amount of foreign direct investment and foreign aid flowing into developing countries dwindled causing a serious gap and crisis in government finance and economic outlook but foreign remittance inflow

seems to be a cushion. Even as various researchers have maintained that over the recent decades, remittances have turned out to be a veritable, reliable and secured source of foreign finances inflow given a drastic reduction in FDI and foreign aid, especially in the less developed economies (Giuliano & Ruiz-Arranz, 2009; Adenutsi, 2011; Rao & Hassan, 2011). The World Bank (2003) further asserted that remittances inflow happen to be reliably secured and a constant source of inflow than the traditional sources of foreign financial inflows which many experts argue that it tends to be pose a countercyclical effect on the economy.

The importance of international migration cannot be overemphasised and this is evidenced by the huge fund transferred into the migrants countries

and the rapid increase in international remittances institutions (Mwangi & Mwenda 2015), the resultant effect is that, in the recent decades, increasingly huge interest on the international remittances has developed drastically in the circle of policymakers/regulatory authorities, scholars/researchers, international financial structure/ institutions, deposit money banks and fund transfer operators. This steady and continuous rise in remittances inflows into less developed countries, including Nigeria, can be attributed to two factors namely; a higher number of people are moving abroad and the means by which funds can be transmitted to another nation are now much cheaper, easier and fast enough (Lime 2016). Studies have shown that in situations where more economies transiting from developing to developed is on the increase, total FDI flows tends to decrease, while on the other hand, inflows from remittances showed an increasing trend; this has supported people's standard of living thereby effectively reducing the level of poverty while ensuring they meet their basic needs (United Nation Economic Commission for Africa, 2013, African Banker, 2013), thereby making remittances inflows to significantly stimulate economic activities through supporting and complimenting consumption, investment activities and savings also (World Bank 2012).

Among researchers and policy makers, the delicate association between remittances and economic growth of recipient economy has been a subject of controversy and heated debate given the lack of consensus among researchers. This has continued to ignite debate among scholars, depending on the side of the various conflicting views relating to the perceived influence of overseas remittance on economic growth of the recipient economy they support. The optimists are scholars whose findings support the view that remittances influences economic growth positively by resultant increase and boosting of investment and development of human capital

from such flows, the proponents of this view include Wadood and Hossain (2015), Mwangi and Mwenda (2015) and Garcia-Fuentes, Pablo and Kennedy (2009). While on the other hand, the pessimists are those whose findings support the view that remittance adversely influence economic growth exerted by inflationary pressure and poor orientation emanating from inadequate labour supply. Scholars in the class as Chami, Fullenkamp and Jahjah (2005), Karagoz (2009), Edwards (2010) and Davis and Carr (2010) maintain such position. There are also researchers who are of the view that foreign remittances exerted no impact on economic growth of receiving economies and they include Shimul (2013). With different works presenting different result on the subject, the mixed creates serious disagreement among researchers which has to be reconciled.

Based on the view of World Bank (2017), global remittances have been on a steady but gradually rise in the recent years to a staggering \$613 billion recorded in 2017, from which \$72 billion flowed into economies in the African continent. In the case of Nigeria, based on available statistics overseas remittance inflows have become an important mode of financial inflow, which had shown remarkable and tremendously increasing trend year on year.

With the above scenario, it became imperative to investigate the influence of foreign remittances on economic growth focusing on the Nigerian context.

## LITERATURE REVIEW

### Concept of international remittances

Foreign remittance refers to funds transferred by international workers migrants to the members of their family back home to their country of origin (lime, 2016; World Bank, 2012; Quartey & Blanson, 2004). Simply put, it's regarded as the fund which is sent back home by migrant workers for their family. This includes but not restricted to transfers of income or accumulated wealth by

individual or collection of migrants back to their countries of origin, which is expected by the families of the migrants to improve the standard of living, primarily designed to support their family members or dependents, either for consumption or investment activities (Lime, 2016; World Bank, 2012). Over the years, there have been a tremendous increase in remittances even as Kanu and Ozurumba (2013) observed that for many developing countries in the world remittances, turned out and assumed the second position as the largest inflow channel in their economy which have resulted into economic growth, improving the income sources, standard of living of family members which has also encouraged and improved the ability to get sound financial services and products, thereby increasing financial inclusion. Owing to the large amounts of funds, foreign remittances are now being considered as a significant contributor to the economic growth and development of a country (Lime, 2016). To this end, World Bank (2012) is of the view that remittances inflows significantly support the economic growth of a country through supporting and complimenting consumption, investment activities, and savings also. Furthermore, Giuliano (2008) has maintained that remittances enable and help in the development of the financial structure and system of a country with poorly developed financial systems. Since it provides other ways in which liquidity constraints can be reduced and investment can be financed. This is evidenced in the varieties of institutions and mechanisms available in transferring the foreign remittances. International remittances can be transferred or transmitted by formal and informal means. The formal means are vital to the flow of remittances, which follows a well laid down procedures with regulated framework to achieve comprehensive financial inclusion policies or drive of government through assisting, enhancing and increasing access to various financial service and products, in both the originating and receiving economies (Agunias & Newland, 2012; Gupta, Pattillo & Wagh, 2009).

The main players in the formal remittances services providers (RSPs) are the banks Money, Transfer Operators (MTOs), and the new transaction technology (NTT) platforms, which include mobile network operators (MNOs). Also Mohapatra, Ratha and Scheja, (2011) support the view that remittances assist in the reduction of panic by investors through providing a creditable, stable secured, constant and important means of foreign exchange which assists in handling of challenges in balance of payments deficits and implementation of projects that are meant for development in the country.

For remittance inflow to have any significant impact on the economy, a great proportion of remittance must be used as saving, which in the long run serve or turned into investment by financial intermediaries by providing loanable fund. If a significant proportion of remittances are to be utilized for consumption such as education, transport or health by the benefiting family, this may translate into building up of the human capital, which can translate into economic increase in the long run. Even in situations where a greater proportion of remittances is expended for consumption, such consumption has the potentials to stirrup the aggregate demand in such an economy, thereby contributing significantly to efficiency, thus promote economic activities which now expressed through significant improvement and increase in productivity, also reducing unemployment in the short run (World Bank, 2012).

Wahba (1991) has successfully grouped remittances inflows into four major categories namely;

Potential remittances – which is assumed to be money left at the disposal of the migrant worker when expenditure has been made by the migrant in the host country;

Fixed remittances – this represents the least amount of funds the migrant worker has to send back home so as to support in meeting the needs

and also meet obligations set by the family members.

Discretionary remittances – this involves the transferring of funds that is above what has been set as of fixed remittances and;

Retained savings – this is regarded as the difference between potential remittances and the remitted funds by the migrant during a stipulated time.

However, there may be some social costs that are not put into consideration in evaluating the impacts of remittances, which in many instances reduce work effort and encourage brain drain, on one hand while on the other hand remittances from migrants occupy a very important position in investment in human capital in the migrant's home country which receives the funds by enabling resource constraints to be relaxed ( Lime, 2016), which may serve as the origin of better health care, quality education and reduction in poverty. In recipient countries, remittance is a core source of an expansion in consumption and investment (Adams, 2011), cushion the negative effect of economic instability and shocks on household/individual welfare (Quartey & Blanson, 2004), having the potential to compliment foreign exchange reserves and income, thereby reducing current account deficit, enhancing the balance of payment position and reducing dependence on external borrowing which is a primary recipe for economic shock (Iqbal & Sttar, 2005). Just as African Banker (2013) summarily and clearly describe the effect by stating that “currently, significance of remittance in developing countries has become a source of finance and brings about economic growth and development through reducing household poverty and increasing their consumption, complimenting in building investment in both human and physical capital which results in less vulnerability from natural and economic shock”. Lime (2016) opined that the developmental effect of international remittances which can be broken down into their

impact on investments, consumption, savings, growth, income distribution and poverty at the macro-economic level.

### **Economic growth and remittance inflow**

According to literature, economic growth is regarded as that expansion in the market value of goods and services which has been adjusted for inflation over time within a given economy. Conventionally it can be measured as the percentage rate of increase in real gross domestic product of a country.

Researchers such as Barrow and Garrt (1989), Aghion and Howih (2009), Manuelli and Anath (2009) and Lime, 2016, have recognized the origin of economic growth to be classified as investment from FDI, investment in physical capital, human capital investment, excess labour, changes in technology, foreign aid and an increment arising from venturing into new concepts and research and development, but with the dwindling FDI and foreign aid, remittances inflows have stepped in. Lime (2016) further maintained that the surge in remittances flow to the country where the migrant workers originate from in the recent years has exceeded foreign aid and FDI flows into less developed economies once again, which has rekindled debate on their development potential on recipient countries. Given the on-going debate on remittance over the years, two basic separate/distinct views or school of thoughts have evolved; which are the Optimist and Pessimist views. The optimist hold the view that remittances exerts significantly positive influence on the growth of recipient economy which is manifested through reduced poverty levels and stimulating economic activities, resulting into economic growth. On the contrary, the pessimists view, upheld that remittance does not stimulate economic growth, but it tend to adversely affect the economy by increasing dependency on the foreign remittances by remit receiving economies thus encourages extreme consumption (Englama, 2009).

## Theoretical review

### Theory of Tempered Altruism

The theory tempered altruism was developed by Stark and Lucas in 1985. This theory of remittances was propounded as a result of the shortcomings of the previous theories trying to explain the nature of remittances. The tempered altruism theory states that remittances integral aspect of an inter-temporal and mutually beneficial contractual plan that is established between the migrant and the household in the recipient nation with the prospect of carrying out investments and taking some risks which has the tendency of reducing poverty and improving economic growth. The family in the recipient country in most cases invests by educating the migrant worker and anticipates yields that flow in the form of remittances as they consider the education as their investment. It suggests that remittances for educated migrants are greater than those of in-laws or even spouses. It is noted that less developed countries' insurance markets and financial markets are not well established and proceeds particularly from agriculture are greatly declining. As a result, migration seems to provide a sensible choice that provides an opportunity to expand and diversify the recipient family's income and value. The existing harsh economic condition prevalent inside the migrant's home country and the nation hosting the migrant worker influence to a large extent the flow of remittance money. In a situation where the migrant worker's country is plagued with negative situations such as natural disasters, the migrant worker is compelled to transfer comparatively much more than when the conditions are favourable. Conversely, in the situation where the migrant worker finds himself or herself in a tight and unpleasant situation such as being unemployed, the migrant worker's family sees it as an obligation to support by sending money to assist the migrant worker.

### The Solow model

This theory was development by Solow (1946) which was predicated on the neo-classical

assumptions which stipulates a multifactor production function which consists of labour and capital which are regarded as close alternatives. It further assumes that the production function will increase in each of the input and will also have a diminishing marginal product. When zero units of input are used for either K or L, then nothing is produced thus  $F(K,0) = F(0,L) = F(0,0) = 0$ . Furthermore, the production function shows constant returns to scale such that:  $ZY = F(ZK, ZL)$ . This Solow Model consists of two equations: a production function and a capital accumulation equation. According to Solow (1946), The production function is expressed as;  $Y = F(K,L)$ . Y represents output, K represents capital and L represents labour. Capital stocks comprised of plant and machinery, road network, factories, warehouses, land etc and labour reflect an economically active population. Therefore, on the basis of this model, for any economy to experience growth a constant increment in the level of stocks of capital reflected by increased investment then supply of labour by way of increase in population have to exist. Investment on capital stock to a large extent relies on savings, while remittance may serve as substitute or to improve the domestic savings level thus it translates or aids a rise in capital funds. Also, expected remittance inflow, to a large extent, may increase the domestic investor's creditworthiness, that may translate into reduced cost of capital for recipient economy of remittance.

### Empirical review

Considerable literature abounds on the subject. The following works were assessed to fully evaluate the subject and they include:

Tolcha and Rao (2016) in assessing the influence of remittances on Ethiopian economic growth employed annual secondary time series data for the years spanning between 1981 and 2012. They employed the ADF unit root test and the ARDL technique in analysing the secondary data sourced from official sources. Findings from the study indicated that in the short run, remittance exerted a positive and significant influence on the economic

growth of Ethiopia, while in the long run, the effect was negative.

Lime (2016) in her study analysed the impact of foreign remittances on the economic growth of Kenya, using annual time series data that covered the period spanning between 1980 and 2014. Data collected was analysed using multiple regression analysis, Unit root test and Johansen test of cointegration. Findings revealed that there was no long-run relationship between the explained and the explanatory variables. Also remittances, trade openness, government expenditure had a direct but insignificant effect on economic growth while inflation, enrolment in secondary education and investment exerted an adverse but insignificant impact on the economic growth of Kenya.

Wadood and Hossain (2015) in their study evaluated the effect of overseas remittances on economic growth of Bangladesh, *In analyzing the* secondary annual time series data collected for the time between 1972 and 2012, Johansen approach to Cointegration, Vector Error Correction Model and Granger Causality test were the analytical technique used in their study. Findings from the study revealed that a long-run relationship exist between remittance and economic growth. Furthermore, remittance exerted a significantly positive effect on the economic growth of Bangladesh.

Mwangi and Mwenda (2015) investigated the impact of international remittances on the economic growth of Kenya. In conducting the study, annual secondary data were sourced from World Bank's Development Indicators covering the period between 1993 and 2013. The sourced data were analysed with ordinary least squares estimation technique of multiple regression analysis and Granger causality test. Findings from the study suggested international remittances exerted a significantly positive influence on the economic growth in Kenya. Also it was discovered that there exists a bi-directional causality moving from international remittances to economic growth and vice-versa.

Najid, Arslan and Muhammad (2013) investigated the effect of remittance on Pakistani economic growth. They employed regression analysis in analysing the data obtained. Findings indicated that remittances had a significantly positive impact on the economic growth of Pakistan, while the result further indicated that inflation rate and exchange rate both had an adverse impact on the economic growth of Pakistan. Furthermore, FDI had a positive but insignificant impact on the Gross Domestic Product of Pakistan.

Shimul (2013) in his study tried to evaluated the association between remittance flow and economic growth in Bangladesh, obtained secondary annual time series data spanning from 1976 to 2007, the analytical technique adopted were Autoregressive Distributed Lag Models and Engle-Granger two step procedure for cointegration test. Findings revealed that remittance exerted no significant influence on GDP per capita of Bangladesh both in the short and long run.

Ali (2012) in his study investigated the relationship between remittance and economic growth with focus on the Middle East and North Africa. Panel data from selected MENA countries for the period spanning between 1980 and 2009 were sourced and analysed the collected data using panel data regression analysis. Findings from the study showed that remittance exerted a significantly positive effect on the economic growth of MENA countries.

Muchemwa (2012) in evaluating the influence of remittance on economic growth, secondary panel data from selected twenty nine Sub Saharan African countries spanning the time period between 1980 to 2008 was sourced and analysed using panel data regression analysis. Findings emanating from the data analysed showed that there exist a significantly positive of remittance on the economic growth of SSA countries.

In their study Jawaid and Raza (2012) assessed the effect of foreign remittances on the economic growth of China and Korea, using data for the period spanning from 1980 to 2009 and the data collected was analysed using cointegration test

and vector error correction model. Findings emanating from the study suggested a positive and statistically significant effect of remittances on economic growth exists both in the long run and short run in South Korea, while evidence from China indicated an adverse impact of remittances on the economic growth both in the long run and short run.

Edwards (2010) attempted to proffer answer to the question “Do remittances promote more economic growth than foreign aid in Latin American and Caribbean countries?” 22 LAC were selected and data was collected for the period spanning between 1979 and 2008 and panel data regression was employed in analysing the data gathered. The result from the data analysed indicated that remittances and foreign aid inflow both adversely and significantly influenced the economic growth of LAC's.

Karagoz (2009) evaluated the association between workers remittances and economic growth in Turkey. The study employed secondary annual time series data spanning the time period between 1970 and 2005. Multiple regression was adopted in analysing the data collected. Findings indicated that remittance had negative and significant effect on the economic growth of Turkey.

Garcia-Fuentes *et al* (2009) in their study used panel data from a sampled 14 LAC countries for the period covering 1975 to 2000, adopting panel data regression analysis in analysing the data sourced, found that remittance had a significantly positive influence on economic growth.

Pradhan, Upadhyay and Upadhyaya (2008) in their study investigated the impact of remittances on the economic growth of developing countries, they selected a sample of 39 less developed economies for the period spanning between 1980 and 2004, the data collected from the selected countries were evaluated using panel data regression analysis. Findings emanating from the study indicated that remittances impacted positively and significantly on the economic growth of the selected LAC' countries.

Qayyum, Javidand and Arif (2008) evaluated the effect of international remittances inflow on economic growth and poverty reduction in Pakistan. Data was collected within the period spanning between 1973 and 2007. The collected were analysed using ARDL approach. Findings from the study suggested that remittances had a positive and significant effect on economic growth. Furthermore, remittances showed a significantly positive effect on poverty reduction

Iqbal and Sattar (2005) investigated the effect of migrant workers remittances on the economic growth in Pakistan during the period spanning 1972 and 2003. The analytical techniques used were cointegration test and vector error correction model. Findings suggest that workers' remittance was positively and significantly correlated to real GDP growth. Furthermore, workers' remittances turned out to be the third most significant source of capital fund for economic growth of Pakistan.

Chami, Fullenkamp and Jahjah (2005), in their study tried to determine if migrant Remittance inflows is a veritable source of capital for development. They collected data from 113 countries for the period, 1970 to 1998, basically between the United States and the home country as elements of remittances, employing panel data regression. Their findings suggested that remittances exerted a significant and adverse impact on capital growth

## **METHODOLOGY**

Based on the nature of the, the *ex-post facto* research design was adopted, also the annual time series data for the variables under investigation were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin 2017, World Bank statistical database and Index Mundi 2017 covering the period, 1986 to 2017.

### **Model Estimation Techniques**

In analyzing the data gathered, the study utilized the ordinary least squares estimation technique of multiple regression analysis, the unit root test, Autoregressive Distributed Lag (ARDL) approach

to co-integration test and vector error correction model. Furthermore, other complementary diagnostic tests such as serial correlation test, heteroscedasticity test and Ramsey RESET test were conducted to ensure appropriateness of the result.

**Model Specification**

To clearly assess the impact of international remittances on the economic growth of Nigeria, the research adapted the model of *Tolcha and Rao (2016) and* thus modified the model to reflect desire of the study, then stated thus;

$$\ln RGDPGR_t = \beta_0 + \beta_1 \ln REM_t + \beta_2 \ln GDI_t + \beta_3 \ln HC_t + \beta_4 \ln INFR_t + \beta_5 \ln INTR_t + \mu_t \dots (1)$$

Where:

- RGDPGR = Real GDP growth rate (Economic growth)
- REM = International Remittances
- GDI = Gross domestic investment
- HC = Human capital (Primary school enrolment)
- INFR = Inflation rate
- INTR = Interest rate
- μ = Error term
- t = Time period

In a bid to effectively estimate the model in equation (2) and (3), Autoregressive Distributed Lag (ARDL) approach designed by Pesaran *et al.* (2001) was utilized. The choice of the ARDL approach was based on the assumption that the ARDL framework tend to be more suitable when the sample size is small and also it can be implemented when the variables are of mixed order i.e I(0) and I(1) which overcame the restriction that variables must be integrated at the same order. Furthermore, the technique estimates both the long run and short run parameters simultaneously and it provides very reliable efficient and consistent result sample sizes whether small or big.

The ARDL formulation can be written as follow;

$$\ln RGDP_t = \lambda_0 + \lambda_1 \ln REM_t + \lambda_2 \ln GDI_t + \lambda_3 \ln HC_t + \lambda_4 \ln INFR_t + \lambda_5 \ln INTR_t + \mu_t \dots (2)$$

While the error correction representation of the series used to estimate the short run association can be specified as follows:

$$\Delta RGDP_t = \lambda_0 + \lambda_1 \Delta \ln REM_t + \lambda_2 \Delta \ln GDI_t + \lambda_3 \Delta \ln HC_t + \lambda_4 \Delta \ln INFR_t + \lambda_5 \Delta \ln INTR_t + \eta ECM_{t-1} + \epsilon_t \dots (3)$$

INSERT TABLE 1 HERE

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**RESULTS AND DISCUSSIONS**

Data on international remittances, inflation, domestic investment, primary enrolment, interest rate and economic growth collected were analysed and the result presented in this section. E-veiw 9.0 econometric software package was used in the estimation of the earlier stated models, also the complementary diagnostic tests were also conducted. The descriptive statistics of the variable were utilized to ascertain the structure and distribution of the variables used in the model. The resultant result from the operation is presented in Table 2.

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**Result of the Stationarity test**

The sttionarity test was done with the view of ascertaining the time series characteristics of the variables. Although the ARDL framework does not in anyway need the pre-testing of each variable for a stationarity or unit root, but the result from the unit root test may assist in arriving at the decision on whether the ARDL model should be employed or not which is to evaluate the integrating level of variables, since the technique, with certainty, will crash when I(2) series are present. Tables 3 present the results of the stationarity tests adopting Augmented Dickey- Fuller (ADF) test.

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Result of the unit root test shown in Table 3, suggests that the time series of the variables were integrated of mixed order, this was informed by the comparison the t-statistic values with their critical values. Three variables were stationary at level while three were stationary at first difference. The ADF Statistics for the respective variables were all negative than their critical values at 5% level of significance. Also the P-values were all less than 5% level of significance, suggesting the non presence of unit root in all the variables in the series. This satisfies the condition for the use of ARDL.

**Result of the ARDL Bounds Test**

Given the result of the stationarity test, confirming that the variables were integrated of mixed order, which provides the justification to proceed and conduct the ARDL bounds test for co-integration in order to ascertain if there exists a long-run relationship between the variables utilized in the model and the results was shown in Table 4.

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Result emanating from the ARDL bound testing approach to co-integration presented in Table 4 showed that the F-statistic with a coefficient of 7.83 is greater than the upper bound value of 3.79 given the 5% level of significance and that of the lower bound value of 2.62 also at 5% significance level. This empirical result indicates that there exists a long run relationship between the variables in the model, which is a desired outcome.

**Regression Results of the Long-run ARDL**

**Model**

Based on the evidence that the real GDP is co-integrated with the explanatory variables in the model, attempt was made to estimate long-run the parameters of the ARDL model and the result is shown in Table 5 below.

INSERT TABLE 5 HERE

The result of the estimated long run equilibrium relationship between the variables in equation (2) is presented in Table 5. The empirical evidence from the result showed that in the long run, remittances has a coefficient value of 0.462, indicating that a billion dollar increase in remittances will result into approximately 0.46 % increase in economic growth of Nigeria, implying a positive effect and this effect is statistically significant given that the P-value is 0.02 which is lesser when compared with 0.05. This is consistent with *apriori* expectation and findings of Wadood and Hossain (2015), Mwangi and Mwenda (2015), Tolcha and Rao (2016) Ali (2012) Lime (2016). The coefficient of human capital is 4.49 with a P-value 0.27, which indicates a positive but insignificant impact of human capital on the economic growth of Nigeria. The finding conforms with *apriori* expectation and contrary to the finding of Mwangi and Mwenda (2015), Tolcha and Rao (2016) and Lime (2016).

While GDI exerted an adverse and statistically significant influence on the real GDP of Nigeria, this conclusion is predicated on the coefficient value of -1.01 and a P-value of 0.03. This is contrary to *apriori* expectation, and the finding of Tolcha and Rao (2016) but it is consistent with findings of Lime (2016).

The effect of Inflation on Nigerian economic growth appears to be positive but insignificant while that of Interest rate is negative and significant judging from the coefficient and P-values of 0.71, -8.22 and 0.12, 0.03 respectively.

In evaluating the entire result of the equation, the R<sup>2</sup> representing the Coefficient of determination, that gauges the power explain the multiple regression model had a coefficient of .863, this suggest that 86.3% changes in economic growth of Nigeria is as a result of the changes in the explanatory variable. This indicates that all variables stated in the model were relevant in

expressing the changes shown in the economic growth of Nigeria within the period under investigation.

Furthermore, F- statistic which is used applied to capture the model's level of the model showed a coefficient of 4.99 with 0.006 corresponding P-value, which happened to be lower than the 0.05 level of significance, this suggest that the explanatory variable as a unit significantly impacted real GDP, which from all indication suggests a well specified model.

**Short-Run Dynamic Regression Results**

After establishing and estimated the long-run parameters, the short-run dynamic parameters within the ARDL framework has to be estimated and the result is presented in Table 6

INSERT TABLE 6 HERE

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 Results of the short-run dynamic coefficients in relations with the long-run association derived through the ECM equation are shown in Table 6. Coefficient of the lagged error-correction term as desired was negatively signed and significant at 5% level, which supports the view indicates the existence of a short-run association between the variables. With an error term of -0.60, this suggests that its adjustment speed of returning back to equilibrium after a period of happens to be high.

Furthermore, the directions expressed by the short-run dynamic effect were not entirely maintained to the long-run. In line with the long-run results, remittance showed a positive and significant influence on the economic growth of Nigeria as expected which is consistent with *a priori* expectation and findings of Jawaid and Raza (2012), **Mwangi and Mwenda (2015)**, **Tolcha and Rao (2016)** Ali (2012) **Lime (2016)**. This is indicative of the fact that remittances have assisted on the path to Nigerian economic growth. Also as expected, human capital development, GDI, and Inflation all positively and significantly influenced the Nigerian economic growth, suggesting that they are strong factors contributing to the economic

growth of Nigeria. On the other hand, Interest rate expressed an adverse and significant effect on the economic growth of Nigeria, suggesting that as interest rate increases, economic growth contracts. The outcome happens to be a desired one.

**Results of diagnostic tests**

To improve the validity and reliability of the outcome of the models stated earlier, diagnostic tests were conducted to test for serial correlation, heteroscedasticity and stability (Ramsey RESET) and the results of the tests were shown in Tables 7, 8 and 9

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Based on the test results on Tables 7, 8 and 9, it is evidenced that the model met the threshold of all the diagnostic tests. It further indicates non suspicion or existence of serial correlation among variables as functional form of the model was properly specified; also nothing suggest the presence of heteroscedasticity in the model as well. The output from this model testing provides a best fit and can be relied upon thereby accepting the results from such testing.

**C O N C L U S I O N A N D RECOMMENDATIONS**

The paper evaluated the impact of international remittances on the economic growth of Nigeria for the period covering 1986 to 2017. In analysing the data collected the ARDL approach to co-integration and VECM to examine the long run and short run relationships among economic growth, remittances, gross domestic investment, Interest rate and inflation rate. Findings indicated that in the long run remittances, human capital development and inflation have positive effect while GDI and interest rate had negative effect on the economic growth of Nigeria. While on the short run remittances, human capital development, GDI and inflation had positive effect while interest

rate had negative impact on the economic growth of Nigeria. In view of the findings the study amongst others recommends that Government should put in place facilities and incentives that will make remittances cheaper using the formal channel, also the introduction of new savings instruments as well as providing information on investible opportunities available in Nigeria will ensure remittances are put into productive use. The creation and functioning of the Migrant and Diaspora Office to be domiciled in the Ministry of External Affairs will serve as a fulcrum in stepping up remittances. Also the government has to make concerted effort so as to improve resources in order to reposition and improve the quality of education, through proper monitoring and implementation of programmes such as provision of true and quality free primary and secondary education. Furthermore, concerted effort should be made by the government and monetary authorities to maintain macroeconomic stability in Nigeria.

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**Table 1: Synopsis of Variables’ Measurement/Description**

Name of variable	Acronym	Measurement	Source	Apriori expectations
Economic growth	RGDPGR	Growth rate of the real GDP	Index Mundi 2017	
International remittances	REM	Total remittances inflows	World Bank statistical database	Positive (+)
Gross domestic investment	GDI	Value of fixed gross capital formation	World Bank statistical database , Index Mundi 2017	Positive (+)
Human Capital	HC	Primary school enrolment	World Bank statistical database	Positive (+)
Inflation rate	INFLA	Rate of Inflation in the economy	CBN ( 2017)	Negative (-)
Interest rate	INT	Prevailing Interest rate	CBN ( 2017)	Negative (-)

Source: Field study 2019

**Table 1:** Summary Statistics, using the observations 1986–2017

Source: Computation by authors with E-view 9.0.

	GDI	HC	INFLR	INTR	RGDPGR	REM
Mean	1.82E+10	92.30517	19.55172	18.39229	4.940176	6.95E+09
Median	3.76E+09	92.23037	11.94700	17.96500	5.397859	1.11E+09
Maximum	8.98E+10	111.8003	76.75887	29.80000	14.60438	2.12E+10
Minimum	2.02E+09	78.61452	0.223606	9.250000	-1.510000	2424527.
Std. Dev.	2.76E+10	7.412603	19.71505	4.260382	3.839102	9.07E+09
Skewness	1.584026	0.511996	1.575494	0.475517	0.407185	0.694903
Kurtosis	3.779756	3.087240	4.299049	3.963364	2.684015	1.550611
Jarque-Bera Probability	14.19277	1.408229	15.48834	2.443382	1.017393	5.376386
	0.000828	0.494546	0.000433	0.294731	0.601279	0.068004
Sum	5.83E+11	2953.765	625.6551	588.5532	158.0856	2.22E+11
Sum Sq. Dev.	2.36E+22	1703.347	12049.17	562.6766	456.8998	2.55E+21
Observations	32	32	32	32	32	32

**Table 3: Summary of Augmented Dickey Fuller (ADF) Unit Root Tests Result with Trend and intercept**

Variables	ADF Test Statistics	Critical Values @ 5%	P-value	Order of Integration
<i>Lnrgdpgr</i>	-4.845891	-3.644963	0.0047	I(1)
<i>Lnrem</i>	-4.552069	-3.557759	0.0051	I(1)
<i>Lnhd</i>	-3.886131	-3.557759	0.0003	I(0)
<i>Lninfla</i>	-5.876755	-3.595026	0.0003	I(0)
<i>Lngdi</i>	-4.555881	-2.960411	0.0010	I(1)
<i>Lnintr</i>	-4.345531	-3.612199	0.0111	I(0)

Source: Computation by authors with E-view 9.0.

**Table 4: Result of the ARDL Bounds Test for Co-integration**

Test Statistic	Value	K
F-statistic	7.833664	5

Critical Value Bounds

Significance	Lower Bound	Upper Bound
5%	2.62	3.79

Source: Computation by authors with E-view 9.0

**Table 5: Result of the estimated Long Run Coefficients of Economic growth-remittance model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
lnREM	0.462638	0.173416	2.667786	0.0219
lnHC	4.489887	3.833668	1.171173	0.2663
lnGDI	-1.010569	0.432439	-2.336907	0.0394
lnINFLR	0.714485	0.432308	1.652720	0.1266
lnINTR	-8.221516	3.364757	-2.443420	0.0326
C	16.377022	23.854336	0.686543	0.5066
LNRGDPGR(-1)	-0.629726	0.178374	-3.530365	0.0047
R-squared	0.863986	F-statistic		4.991008
Adjusted R-squared	0.690878	Prob(F-statistic)		0.005477

Source: Computation by authors with E-view 9.0

**Table 6: Result of the Short-run error correction estimates**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNREM)	0.280944	0.099616	2.820286	0.0167
D(LNHD(-1))	8.543460	3.026025	2.823328	0.0166
D(LNGDI(-1))	0.988353	0.486043	2.033470	0.0669
D(LNINFLR)	0.480032	0.161779	2.967216	0.0128
D(LNINTR(-1))	-2.407689	0.737450	3.264884	0.0075
ECT(-1)	-0.607266	0.154807	-3.922718	0.0024

Source: Computation by authors with E-view 9.0

**Table 7: Result of the Breusch-Godfrey Serial Correlation LM Test**

F-statistic	1.362587	Prob. F(2,9)	0.3041
Obs*R-squared	6.042941	Prob. Chi-Square(2)	0.0787

Source: Computation by authors with E-view 9.0

**Table 8: Result of the ARCH Heteroskedasticity Test:**

F-statistic	0.034911	Prob. F(1,22)	0.8535
Obs*R-squared	0.038024	Prob. Chi-Square(1)	0.8454

Source: Computation by authors with E-view 9.0

**Table 9: Result of the Ramsey RESET Test**

	Value	df	Probability
t-statistic	4.050143	10	0.0023
F-statistic	16.40366	(1, 10)	0.0023

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	2.117928	1	2.117928
Restricted SSR	3.409060	11	0.309915
Unrestricted SSR	1.291132	10	0.129113

Source: Computation by authors with E-view 9.0