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An Examination of the Effect of Migrant Remittances on Human Capital Development & Agricultural Productivity in Nigeria: *An ARDL Approach*

OKOH, Abo Sunday[1], OJIYA, Emmanuel Ameh[2], ISIWU, George Duhu, Ph.D[3]

[1]Lecturer, Department of Economics, Federal University Wukari, Taraba State, Nigeria
[2]Lecturer, Department of Economics, Federal University Wukari, Taraba State, Nigeria
[3]Senior Lecturer, Department of Economics, Enugu State University of Science and Technology (ESUT), Enugu State, Nigeria

Abstract:
This study is an attempt to bridge the academic and policy debates on the migration-development nexus using econometric tools of analysis in measuring the impact of migrant inflows or workers' remittances on human capital development and agricultural productivity in Nigeria between 1981 to 2016. Data for the study were sourced from the World Bank Development Indicators (WBDI) (2015). Empirical findings from the study are quite instructive. First, the Augmented Dickey-Fuller (ADF) unit root test and ARDL Bounds testing revealed evidences of stationarity and long-run equilibrium relationship among the variables in the model. Findings from the ARDL long-run and short-run regression revealed that, migrant remittances have no significant impact on human capital development in Nigeria during the period studied. Furthermore, migrant remittances holds a positive prospect of growth in agricultural productivity for Nigerian households in the long-run, but there appears to be no immediate gains and or benefits from migrant inflows to growth in agricultural productivity in Nigeria in the short-run. It is therefore recommended that Nigerian migrants be encouraged to send more remittances to their relatives / households in order to build-up human capital and increase agricultural productivity which will lead to a reduction in poverty and increase the long term developmental objectives of Nigeria as a nation.

Keywords*: Migrant; Remittances; Human Capital Development, Agricultural Productivity; ARDL*

1.0 Introduction

1.1 Background To The Study

Remittances can be defined as the international migrant worker's earnings portion that migrants sent back to the origin country from the employment country. This definition has been modified by International Monetary Fund to include transfers made by workers who have resided in foreign economies for about a year. This however does not constitute transfers from self-employed migrants. It is a widely held view that remittances are an economic force that is very powerful for economic development in labor-exporting nations offering financial resources. In addition to sustaining the basic needs for many families and thereby alleviating poverty, the financial resources also support private sector investment (Tailor, 2004). Also, remittances could be seen as the portion of international migrant workers' earnings sent back from the country of employment to the country of origin. Remittances can be sent in cash or kind (Solimano, 2003).

Just as in other African countries, remittances are historically part of the culture in Nigeria. Indeed, the social experience is that the family is naturally bound together and therefore sharing with parents from one's resources is culturally mandatory. Domestic remittances are prevalent in Nigeria as well as other African nations. A difference however exists between internal domestic remittance and the one that is globalization-driven in reference to quantum, sheer money value set in foreign currency. It has increased as a result of the high value associated with foreign currencies as opposed to the national currencies. This situation emerged as a result of Nigerian economic collapse in 1980s which brought about massive unemployment as well as

other hardships. This situation was aggravated further by IMF imposition of Structural Adjustment Programs in mid-1980s. The programs were implemented under Babangida administration, and were the origin for the chronic hardships experienced by masses including high unemployment rate. Good governance issues together with government's inability to solve unemployment had made semi and highly skilled Nigerian professionals' emigrants to many European destinations such as Netherlands, USA, Canada, Germany, Italy and Britain in search of greener pastures (Orozco and Millis, 2007).

Remittances, funds received from migrants working abroad, to developing countries have grown dramatically in recent years from USD3.3 billion in 1975 to close to USD289.4 billion in 2007 (World Bank, 2009). They have become the second largest source of external finance for developing countries after foreign direct investment (FDI) and represent about twice the amount of official aid received, both in absolute terms and as a proportion of GDP. The phenomenal growth of remittances in recent times has caught the attention of governments particularly in the developing countries, international organizations, Non-Governmental Organizations (NGOs) and the private sector, due to its importance as a viable source of external financing. It has outperformed some traditional capital inflows such as foreign direct and portfolio investments in several countries while it had become a major source of foreign exchange for others. By its nature, remittances are countercyclical in nature, voluntary and targeted at improving the welfare of family members in home countries. The inflow of remittances during period of economic downturn when compared with other flows further highlights its potential as an economic development tool. Studies have shown that several factors influence the decision to remit money from abroad. One of such factors is the prevailing economic circumstance in the country of origin. Other factors include wage rates, exchange rates and inflation rate (Russell 1986).

Furthermore, socio-demographic characteristics of migrants, political, economic and legal environment of home country of remitters are part of the factors worthy of consideration. Strong cultural behavior and emotional links to the migrants' home of origin are also critical. Although several developing countries such as Mexico, India, the Philippines, etc, had long taken advantage of remittance to boost their economic growth, others such as Nigeria are beginning to recognize the need to enhance the inflow of remittances. The importance of remittances in the developmental process of some countries and regions is now receiving greater attention. The Millennium Development Goal [MDG] (2005) claimed that remittances act as financial catalyst to close the gap of financial requirements of USD 273 billion for poverty to reduce by half in 2015. The inflow surpasses the amount of Official Development Assistant (ODA) and is more than the size of foreign direct investment (FDI). For instance, remittances are second most important source of foreign exchange after oil revenue in Nigeria. The amount of the inflow rose from $22 million in 1980 to $19.8 billion in 2010 and by 2014, it has increased by more than $1 billion. Due to this huge and rising inflow, Nigeria was ranked the fifth remittance receiver in the developing world and first in Africa (World Bank, 2014).

1.2 Problem Statement, Objective of the Study

Over the past three decades, Nigeria has witnessed large movement of its labour, both graduate professionals and non-graduate professionals from one country to the other basically in search of greener pastures. Some of these factors attributable to migration include the high rate of unemployment and low levels of incomes in the country. There has been a remarkable increase in emigration to Europe, North America, the Middle East and South Africa, following economic downturn, introduction of liberalization measures and emergence of repressive military dictatorship (Adedokun, 2003). Nigeria is by far the largest recipient of remittances in the sub-Saharan African region, accounting for about 67 percent of the inflows to the region in 2012, followed by Senegal and Kenya (World Bank, 2013).

Due to the large size of remittances received by Nigerians this study seeks to examine the effect of migrant remittances on human capital development and agricultural output in Nigeria with particular reference to educational attainment (school enrolment) as proxy for human capital development and agricultural value added per worker in Nigeria between 1986 to 2016. Most studies in the past have dwelt on the impact of

migrant remittances on economic growth in Nigeria without a critical examination of its effect on key micro-variables like school enrolment and agricultural productivity per worker. This is the aim for which this study is undertaken, Specifically, the study shall empirically examine (i) the impact of migrant remittances on human capital development in Nigeria and (ii) the impact of migrant remittances on agricultural productivity (output) in Nigeria.

1.3 Research Questions and Hypotheses for the study

The study seeks to provide answers to the following research questions formulated. They are

(i) What is the impact of migrant remittances on human capital development in Nigeria?

(ii) What is the impact of migrant remittances on agricultural productivity in Nigeria?

At the end, the following hypotheses formulated shall be empirically tested.

H_{01}: Migrant remittances has no significant impact on human capital development in Nigeria

H_{02}: Migrant remittances has no significant impact on agricultural output in Nigeria

The remaining sections are classified as follows: Section two deals with literature review, section three is dedicated to methodology adopted for the study, data presentation, analysis and interpretation are carried out in section four, while summary, conclusion and policy recommendations are dealt with under section five.

2.0 Theoretical Framework

In their quest to examine the impact of remittances on the Nigerian economy in different countries economists have come up with diverse theories or hypotheses to explain this phenomenon or concept. For the sake of this study, two theories and or hypotheses are designed to serve as framework for this work. They are migration theories and theories of remittance.

2.1 The Migration Theories

The degree of freedom that a potential individual migrant has in deciding on whether to move or stay depends largely on several factors such as wealth, network links, perception of more and/or better economic opportunities and prestige. There are theories that clarify the impact that these factors have on migration decisions. Some factors are explained by the theories as pull-factors; they are in form of incentives from the host countries that draw migrants into the country. Others are described as push-factors because they are negative circumstances in the immigrant's home countries that push them to other countries. Migration theories provide explanation for the degree of variation in the causes of migration in various countries. For instance, they explain the reason why a strong causal factor in one country is not strong enough in another. Transaction costs, tedious visa processes and travel expenses required to migrate to a high-income country such as the United States of America and European countries cause some migrants to opt for cheaper and closer alternatives like South Africa. As put by Haugen (2012:66) "One response to the rising barriers to entry to Europe and North America is migration towards more accessible, but less attractive countries in the developing world." Migration destinations in the south are often middle-income countries that attract migrants from nearby low- income economies (Hugo and Piper, 2007, cited in Haugen, 2012). The subsequent section briefly discusses four chosen theories of international migration and relays their perspective on the push-pull factors influencing migrants' decisions.

2.1.1 The Neoclassical Theory of Migration

The neoclassical theory of migration firstly discussed is probably the most influential theory of migration. It is focused on differentials in wages and employment conditions between countries as well as on migration costs as factors causing migration. According to the theory, potential migrants estimate the benefits and costs of migrating before making such decisions; hence migration occurs if their expected return (ER) is positive (Arango, 2000). "This theory of migration is based on familiar tenets like rational choice, utility maximisation, expected net returns, factor mobility, wage differentials and the fact that migration results from the uneven geographical distribution of labour and capital." (Arango, 2002). According to this theory,

workers tend to move from countries with abundance of labour and low wages to others that are labour-scarce with higher wages - hence the principal motivation for migration is the increased welfare that individuals receive from higher labour income or wages.

However, the Neoclassical theory of migration is argued to suppress the role of non-economic factors which to a large extent play a deterministic role in an individual migrant's decision to leave his home country (Arango, 2002). The theory has failed to explain why few people move in view of existing and very large income gaps across countries. One would expect that massive numbers of labour would be migrating across countries (that have scarce labour) with new information or the perception of higher returns on labour but the reality is that existing barriers such as obtaining travel permits, visas and other documents which intending migrants must have, limits the degree of such exchange of labour across countries (labour immobility).

2.1.2 Push-Pull Theory of Migration

The theory of pull and push factors examine and explain the factors of migration in both countries including home and host countries. The factors of migration in the home country determine the choice of migration and proved helpful in the process of migration. The demographic factors including growth in population, economic factors like high unemployment and low living standards in the home country and socio political factors are included in these factors. These factors are identified as push-factors. The factors of migration in the receiving country including but not limited to: labor demand, better economic and political conditions, existing rules and regulation and incentives for immigration. These factors are identified as pull factors. Any types of migration such as domestic or international etc. might be examined in the light of pull and push factors. The negative characteristics at home country are included in the push factors and the positive characteristics at the center of destination are included in the pull factors (Datta, 2002).

2.2 Theories of Remittance

2.2.1 Motivations to Remit

In order to understand how remittances are used and invested, the motives behind remitting should be investigated. The earliest literature on remittances claims that the reasons for remittances are pure altruistic ones. Lucas and Stark (1963) introduced an altruistic utility function where the migrant's utility emboldens the consumption of the other household members. Recent studies have also focused on the fact that self-interesting reasons for remitting exist. This theory still puts the family in focus since it regards the family as a business or a network of contracts that empower the members to engage in pareto-improving arrangements. If migrants have investments that need to be looked after while they are abroad, they will employ family members in the home country as their agents. In this case, remittances are used for managing migrants' interests as well as some compensation for the agents. Furthermore, the family may have the role of financial intermediary. Stark (1999) as well as Agarwa, and Horowitz (2002), claimed that the family can act as an insurance company that protects its members against income shocks by verifying the sources of income. On the other hand, (Poirine, 1997; Glytsos, 2002 and Ilahi, 1999) portrayed the household as a bank that finances migration for its members. The borrowers remit to pay back the loans that are put towards more loans to promote the interests of other household members. Migrants are risk averse and sensitive to political and economic situation in their home country when remitting.

Glytsos, 2002 suggests that money flows determined by these characteristics are "desired" remittances, whereas transfers that are of a more obligatory character for family support are "required" remittances. The motives to remit may be a combination of altruism and self-interest, so called "tempered altruism" or "enlightened self-interest". Despite the motives, the magnitude of remittances is to be decided by the income of the remitter. The higher the income, the larger the remittances into the recipient country, this has to be complemented by the income of the receiver. If the motives to remit are altruistic ones, remittances are larger the lower the income of the recipient. On the other hand, if the motives to remit are self-interest ones, the determinant factor for the magnitude of remittances will be the migrant's return on investment in the home country, and the difference between this return and the return in the emigration country (Clark, 2001).

Even though remittance arrangements seem to be truly self-interested at first sight, the mechanism on which they rest upon may be an altruistic one. A migrant might be expected to live up to her obligations or family's expectations whose members are the counterparties to the agreement. Research has shown strong evidence that family ties which rest upon altruism justify much of the remittances. Altruism in this sense is the migrant's concern about income or consumption levels of its' family in the home country. Numerous theories have been advanced to explain why one rational household will send some level of remittances to another. Most of these explanations have viewed remittances within the context of internal or international migration.

2.2.2 Pure Self-Interest

While altruistic motives might be sufficient to explain the existence of positive levels of income transfers between households, it is far from necessary to invoke peoples behaviour in order to provide a rationale for remittances. Households which are purely motivated by self- interest may find it optimal to remit as part of a, possibly inter-temporal, implicit or explicit exchange contract. A variety of such models exist in the literature; the common feature is that remittances are paid in exchange for some service which the recipient household provides. According to the literature on migration, migrant welfare might depend on actions undertaken by the residuary household in the past, at present, or in the future. This might involve strategic bequests of wealth or land whereby the division of the residuary household's estate is conditional on actions, including the payment of remittances, undertaken by the migrant.

Another potential service provided by residuary households is the management or disposal of migrants' assets held in the home land or region which the migrant envisages enjoying on return (Lucas, 1985). Poirine (1997) views remittances as the repayment of an informal loan which migrants borrowed in order to invest in human capital, while Docquier (1998) views remittances as a bribe which prevents the migration of unskilled workers from the home country or region diluting the quality of the pool of migrant labour in the destination location. The service provided by the recipients need not be so tangible; where a migrant donor has a reputation as a generous remitter, this may increase their standing in the community on return to the homeland. The 'service' provided by the recipient might simply be to receive the remittance payments and presumably make sure that it is common knowledge that they have been received.

3.0 Study Methodology

3.1 Variables and Sources of Data used in the Model

The data for the study is made up of annual time series secondary data sourced from World Bank database website (World Bank Development Indicators) (2015). Variables employed for the study are personal remittances (M-remit), human capital development (proxied by school enrolment rate), agricultural productivity (proxied by agricultural value added per worker) (Ag-Prod) and exchange rate (Excr).. The data ranges from 1981 to 2016, a thirty-five years period. For the sake of clarity personal remittances is expressed as percentage of GDP, agricultural value added per worker in US dollars while exchange rate is expressed in the ratio of Naira to US dollars respectively. This study is based on the assumption that the inflow of net personal remittances affects school enrolment (human capital development) and agricultural productivity in Nigeria positively. Exchange rate is used as control variable to avoid the problem of omitted variable bias in the model so as to get a more realistic model.

3.2 Estimation Techniques: ARDL Modelling Approach

The estimation technique adopted for this work is based on Auto-regressive Distributed Lag (ARDL) approach and Error Correction Mechanism (ECM). The ARDL modeling approach popularized by Pesaran and Pesaran (1997), Pesaran and Smith (1998), Pesaran and Shin (1999), and Pesaran et al. (2001) has numerous advantages. The main advantage of this approach lies in the fact that it can be applied irrespective of whether the variables are I(0) or I(1) and that none of the variables is stationary at 1(2) and beyond (Pesaran and Pesaran 1997, pp.302- 303). Another advantage of this approach is that the model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modelling

framework. Moreover, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation (Banerjee et al. 1993, p.51).

The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information. It is also argued that using the ARDL approach avoids problems resulting from non-stationary time series data. This study illustrates the ARDL modelling approach by considering the following equation:

$Ln(M\_REMIT) = \delta_o + \delta_1 Ln(HUMCAP) + \delta_2 Ln(AG\_PROD) + \delta_3 Ln(EXCR) + \mu_t \ldots$ *(eqtn 1)*

Where

M_REMIT	=	Migrant Remittances (proxied for personal remittances)
HUMCAP	=	Human capital development (proxied for school enrolment rate)
AG_PROD	=	Agricultural productivity (proxy for agricultural value added per person)
EXCR	=	Exchange Rate
μ_t	=	Stochastic error term / time trend

Moreover, δ_0, δ_1, δ_2, δ_3, δ_4, δ_5 are the respective parameters.

The equation of ARDL is as follows:

$$\Delta Ln(M\_REMIT)_t = \alpha_o + \alpha_1 Ln(HUMCAP)_{t-1} + \alpha_2 Ln(AG\_PROD)_{t-1} + \alpha_3 Ln(EXCR)_{t-1} + \sum_{i=1}^{m} \beta_1 HUMCAP_{t-i} + \sum_{i=1}^{m} \Theta_2 AG\_PROD_{t-i} + \sum_{i-1}^{m} \delta_3 EXCR_{t-i} + \varepsilon_t \ldots\ldots \quad \textit{(eqtn 2)}$$

where:

The null and alternative hypotheses are as follows:

H_0: $\lambda_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4$ (No long run relationship exist)

Against the alternative hypothesis:

H_0: $\lambda_0 \neq \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4$ (Long run relationship exist)

The ARDL approach to cointegration involves three stages. In the first stage, the hypothesis that cointegration is absent is tested. More specifically, the null hypothesis is that the coefficients of lagged regressors (in levels) in the underlying ARDL error correction model are jointly equal to zero. The null hypothesis is defined by: H_0: $\lambda_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4$ (No long run relationship exist) and it is tested against the alternative hypothesis that $\beta_0 \neq \beta_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4$ (Long run relationship exist).

The ARDL approach uses the F-test to determine the presence (or not) of a cointegrating relationship between variables, although the asymptotic distribution of the F-statistic in this context is not standardized without taking account of whether the variables are I(0) or I(1). The critical values of this distribution are given in Pesaran and Pesaran (1997), and Pesaran et al. (2001). Two sets of values are presented in the form of a table. The first set assumes that all the variables are I(1), while the second set assumes that all the values are I(0). This makes it possible for the variables to be stationary and first-order integrated. If the value of the calculated F-statistic is higher than the highest value of this region, the null hypothesis is rejected, thus indicating the presence of cointegration between variables without taking account of whether they are I(1) or I(0). If the value of the F-statistic falls below this region, the null hypothesis of no cointegration cannot be rejected, whereas an F-value lying within the region implies that the result of the test is indeterminate.

If the existence of a long-run relationship between the variables is borne out, the second stage in the analysis consists in estimating the short-run and long-run parameters, using the ARDL approach. Once the long-run relationship between the variables is determined, then the estimates of the long-run ARDL can be obtained. If a long-run relationship between the variables exists, then there also exists an error-correction representation. Consequently, the error correction model is estimated in the third step; it indicates the speed of adjustment to long-run equilibrium following a short-run shock.

A general error-correction representation of equation is formulated as follows:

$$\Delta Ln(M\_REMIT)_t = \beta_o + \sum_{i=1}^{m} \delta_1 \Delta HUMCAP_{t-i} + \sum_{i-1}^{m} \Pi_2 \Delta AG\_PROD_{t-i} + \sum_{i-1}^{m} \alpha_3 \Delta EXCR_{t-i} + \varphi_1 ECM_{1t-1} + \varepsilon_t \quad \ldots \quad (eqtn\ 3)$$

Where,
φ = Speed or rate of adjustment; δ_1, Π_2, α_3, represents the coefficients of the variables respectively; Δ is the difference operator, *m* is the lag length of the variables; ect_{t-1} denotes the residual from the cointegration equation (the error correction term), and ε_t is the uncorrelated white noise residuals.

4.0 DATA ANALYSIS AND INTERPRETATION

4.1 Estimation of Stationarity Properties of Series in the Model using Augmented-Dickey Fuller Unit Roots Tests

Before carrying out the ARDL bounds test, we first test for the stationarity of all the variables in the model to determine the order of integration for each variable. This is a necessary step to ensure that variables are not second-order stationary (i.e., I(2)) and to avoid fallacious results. According to Ouattara (2006), the calculated F-statistics which Pesaran et al. (2001) provide are not valid in the presence of I(2) variables, since the bounds tests are based on the assumption that variables are either I(0) or I(1). Consequently, the use of unit root tests in the ARDL procedure may still be needed to make sure that none of the variables is integrated of order 2 or beyond. For clarity and ease of understanding the results from the ADF unit root tests are hereunder tabulated:

Table 1: ADF Unit Root Test with Intercept

Variable	Level	1st Difference	5% Critical Value	Order of Integration/P-value	
Log(M_REMIT)	Non-Stationary	-6.771377	-2.951125	I(1)	**[0.0000]**
Log(HUMCAP)	Stationary	-3.123643	-2.948404	I(0)	**[0.0339]**
Log((AG_PROD)	Non-Stationary	-5.677823	-2.951125	I(1)	**[0.0000]**
Log(EXCR)	Non-Stationary	-5.026540	-2.951125	I(1)	**[0.0002]**

Source: Author's Computation using E-views version 9.0

The ADF test showed that migrant remittances, agricultural productivity and exchange rate are all integrated of order one I(1), while human capital development is integrated of order zero I(0). Having ascertained that the orders of integration of the variables are either 0 or 1, we can therefore confidently apply the ARDL bounds tests to our model.

4.2 The ARDL Bounds Testing

After establishing the order of integration of series in a model, the next procedure in using the ARDL technique is to test for the presence or otherwise of a longrun relationship by applying Bounds test developed by Pesaran et al. (2001) to determine the existence (or not) of a long-term relationship between the variables. Since the dataset is relatively small, we choose a lag length of one. The cointegration test results are reported below.

Table 2: Cointegration Test using ARDL Bounds Testing Approach

Test Statistic	**Value**	**K**
F-Statistic	6.032402	3
Critical Value Bounds		
Significance	***I(0) Lower Bounds***	***I(1) Upper Bounds***
5%	2.79**	3.67**
1%	3.65	4.66

Notes: The critical values are taken from Pesaran and Pesaran (1997: 478) with five regressors.
** denote rejecting the null at 5% level of significance. The range of the critical value at 5% and 1% are 2.79 – 3.67; 3.65 – 4.66 respectively.
Source: Author's Computation Using E-views 9

The cointegration (ARDL Bounds testing approach) result above implies the rejection of the null hypothesis that no long-run relationship exists between the variables. In the alternative it is concluded that evidence of cointegration or of a long-run relationship exists between migrant remittances, human capital development, agricultural productivity and exchange rate respectively between 1981 – 2016. To be precise, cointegration is achieved if and only if it's reported that the calculated F-statistics of the joint null hypothesis that there is no long-run relationship between the variables is greater than the lower and higher bound of the 95 percent critical value interval. From the table above, the F-statistic value of 6.032402 is greater than the lower and higher bound of 95 percent critical value (2.79 – 3.67), thus leading to the rejection of the formulated null hypothesis of no cointegration.

4.3 Estimation of the long- and short-term dynamics

The next step of the ARDL methodology consists in searching for the short-run and long-run coefficient estimates of the model. On the basis of the Schwarz Bayesian criterion (SBC), the optimal ARDL model selected by E-views 9 is ARDL (1, 2, 2, 2). The SBC was preferred because it is more parsimonious than the more popular Akaike Information Criterion (AIC). The empirical results of the long-run and short-run coefficients are presented below.

Table 3: ARDL Regression output

Variable	**Coefficient**	**Std Error**	**t-statistic**	**P-value**
Long-run Estimates				
C	-1.330276	3.364101	-0.395433	0.7127
Log(Humcap)	-0.035523	1.818749	-0.019532	0.9854
Log(Ag-Prod)	0.010720	1.285922	0.008337	0.9937
Log(Excr)	0.477119	0.178370	2.674890	0.0555
Shortrun Estimates				
Dlog(Humcap)	-0.674481	0.210103	-3.210240	0.0326
Dlog(Humcap(-1))	-0.627956	0.177998	-3.527882	0.0243
Dlog(Ag_Prod)	-0.492932	0.109544	-3.670062	0.0214
Dlog(Ag_Prod(-1))	2.785402	0.667752	4.171313	0.0140

Dlog(Excr)	1.319744	0.120363	10.964675	0.0004
Log(Excr(-1))	-1.729637	0.157481	-10.983139	0.0004
ECM	**-0.195188**	0.025131	-7.766854	0.0015

Source: Author's Computation Using E-views 9

The presence of co-integration or a long-run relationship among specified variables demanded the specification of the error correction model. Table 3 above contains estimates of ECM for remittance in Nigeria. The coefficient of the error correction term is negative and statistically significant at 1% probability level. The result, validates the existence of a long-run equilibrium relationship among the time series (human capital development, agricultural productivity and exchange rate) in the remittance equation, and also indicates that, the inflow of remittance in Nigeria is sensitive to the departure from its equilibrium value in the previous periods.

The slope coefficient of the error correction term (**-0.195188**) represents the speed of adjustment and is also consistent with the hypothesis of convergence towards the long-run equilibrium once the remittance equation is disturbed. The speed of adjustment of remittance to previous equilibrium position once there is exogenous shock is about 19.5% per annum. Precisely, the ECM coefficient implies that about 19.5% of any disequilibrium in the system is corrected every year. This implies that for long-run equilibrium to be restored, it would take the system approximately five years and two months (terminating by 2021) to bring it back to an equilibrium level again. This suggests that there will be a convergence within this period to equilibrium path regarding migrant remittances, human capital development and agricultural productivity in Nigeria.

The results of the estimated long-run estimates shown above revealed that only human capital development (a proxy for school enrolment rate in Nigeria) is inversely related to the dependent variable, while agricultural productivity (proxy for agricultural value added per person) and exchange rate coefficients are positively related to migrant remittances in Nigeria within the period studied. In the short-run however, all parameter estimates (humcap, Ag_prod and Excr and their lags) are significantly related to the dependent variable (migrant remittances).

4.4 Major Findings

The study empirically reveals that in the long-run the coefficient of human capital development showed an inverse and insignificant association with the inflow of migrant remittance in Nigeria between 1981 to 2016. This means that, as remittance increases, human capital development (school enrolment in remittance receiving households) decreases. The short-run estimates are in conformity with the long-run estimate of a negative relationship. Similarly, it is reveals that in the long-run, the inflow of migrant remittance has a positive but insignificant association with agricultural value added per person (Ag_Prod) in Nigeria. This implies that, as remittance increases, agricultural productivity per worker also increases, albeit insignificantly. The short-run result however contradicts the long-run estimate. The slope coefficient of agricultural productivity (Ag_prod) in the short-run reveals an inverse relationship with the dependent variable. This implies that remittance has a statistically significant negative relationship with agricultural productivity in the short-run (i.e. as remittance increases, agricultural productivity (output) per person declines).

Structural and Diagnostic Test

The model for this study was tested for normality, serial correlation, heteroscedasticity and stability. These diagnostic checks are crucial in econometric analysis, because if there is a problem in the residuals from the estimation of a model, it is an indication that the model is not efficient, such that parameter estimates from such model may be biased

Table 4: Residual Diagnostic Tests

Type of Tests	P-Value
Residual Normality Tests	0.291653
Residual Heteroskedasticity Tests	0.4160
Residual Serial Correlation LM Tests	0.3861

The results as presented in Table 6 suggest that the model is well specified. The diagnostics indicates that the residuals are normally distributed, homoskedastic and serially uncorrelated and the parameters appears to be stable. This is attested to by the insignificant probability values. The result of the CUSUM stability test indicates that the model is equally stable. This is because both the CUSUM lines fall in-between the two 5% lines. Thus we can conclude that the model is valid for decision and policy analysis.

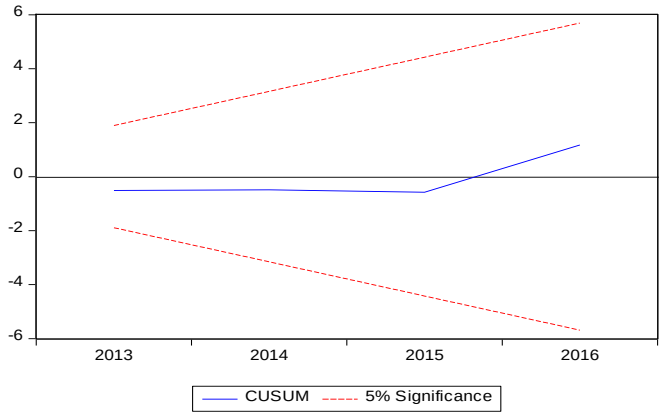

Fig. 1: CUSUM graph
Source: From E-views version 9.0

5.0 CONCLUSION / POLICY RECOMMENDATIONS

Inspite of the fact that the nexus between migrant remittances and human capital development has been causing lively academic debate for several years, no real and tangible attempt has been made to observe the impact of migrant-associated foreign currency flows on human capital development and agricultural productivity in the migration-receiving states such as Nigeria. Very little empirical work has been carried out to analyse the impact it has on school enrolment (human capital) and agricultural productivity in general. Most studies that have been carried out on remittances in Nigeria have looked at its impact on poverty and on economic growth generally. In fact the literature on the impact of migrant inflows on human capital development is sparse. This study therefore attempted to fill that gap and to bridge the academic and policy debates on the migration-development nexus using econometric tools of analysis in measuring the impact of migrant inflows or workers' remittances on human capital development and agricultural productivity in Nigeria between 1981 to 2016. Data for the study were sourced from the World Bank Development Indicators (WBDI) (2015). Empirical findings from the study are quite instructive. First, the Augmented Dickey Fuller (ADF) unit root test and ARDL Bounds testing revealed evidences of stationarity and long-run equilibrium relationship among the variables in the model. Findings from the ARDL long-run and short-run regression revealed that, migrant remittances have no significant impact on human capital development in Nigeria during the period studied. Furthermore, migrant remittances holds a positive prospect of growth in agricultural productivity for Nigerian households in the long-run, but there appears to be no immediate gains and or benefits from migrant inflows to growth in agricultural productivity in Nigeria in the short-run. It is therefore recommended that Nigerian migrants be encouraged to send more remittances to their relatives / households in order to build-up human capital and increase agricultural productivity which will lead to a reduction in poverty and increase the long term developmental objectives of Nigeria as a nation.

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