



Inward Remittances, Banking Sector Development and Economic Growth in Nigeria (1981 – 2015): The Missing Link

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Abstract: Inward remittances are now global phenomenon and there has been considerable debate on the developmental impact of inward remittances on economic growth. However, there are concerns as to whether or not remittances alone or remittances and banking sector development could have significant impact on economic growth in Nigeria. This study sought to (i) examine the effect of household inward remittances on economic growth of Nigeria (ii) investigate the joint impact of inward remittances and banking sector development on economic growth in Nigeria. Using Generalized Method of Moment (GMM) estimator to analyze time series data from 1981 to 2015 sourced from World Development Indicators. Result showed that; (i) Coefficient of inward remittances has positive but insignificant impact on economic growth in Nigeria ($\beta=0.0824$, $P=0.2412$). (ii) Coefficient of interaction between inward remittances and credit to private sector exert negative and significant impact on economic growth ($\psi= -0.1690$, $P=0.0252$). This study therefore concludes that remittances substitute for shallow financial system in Nigeria by loosening liquidity constraint of potential and existing entrepreneurs and also improving allocation of funds to capital starved businesses in Nigeria. It is therefore recommended that Nigerian banks should develop and market remittance-linked financial products instead of serving as mere cash centers for money transfer agents without value add.

Keywords: Inward remittances, economic growth, banking sector, GMM, Nigeria

1. INTRODUCTION

The macroeconomic impact of inward remittances is furiously being debated by the academia and policy makers but empirical evidence on the macroeconomic impact of inward remittances produced three schools of thought; the pessimistic school, optimistic school and, recently middle of the road approach, thereby leaving the academia in quandary. Available data from World Bank revealed that despite the huge resource inflow of remittances into the Nigerian economy that averaged \$20bn per annum some features prevalent before the upsurge of remittances inflow still persist. For example, World Bank (2010) report put Nigerians living below poverty level, at \$2 a day at 82%, just as economic growth remained stagnant at 6% since 2005 till 2015. The banking sector which is supposed to play significant intermediation role of channeling remittance savings to capital starved business sectors is still characterized by many small and uncompetitive banks. This is indicated by low ratio of credit to private sector as a percentage of GDP at 36.89% and 34.78% and money supply to GDP 38.14% & 37.78% in 2009 and 2010, respectively (CBN, 2010). This ratio is still low when compared with other less remittance recipient countries like South Africa that received only \$8.6b and \$10.6bn in 2009 and 2010 but recorded 189% and 191% in credit to private sector in the corresponding period. South African broad money supply as a percentage of GDP is 80% and 78% in 2009 and 2010, respectively (World Bank, 2012). The above features seem to lend credence to the pessimistic school, which suggests that inward remittances could be detrimental to recipient economy as exposure to wealth of migrant families, could cause a change in local taste that fuels demand for foreign goods at the expense of local products. This is a clear recipe for a phenomenon called ‘‘Dutch disease’’. Moreover, since prior empirical studies have suggested that the channel through which inward remittances could affect economic growth is the savings/investment channel through banking credit to private sector, it is however unclear whether or not the Nigerian economic performance as well as banking sector has been altered as a result of remittances inflows. The theoretical foundation of the

credit channel is anchored on the asymmetric information in the financial market that enables banks to play special role in the economic growth process by providing finance to some class of borrowers in need of finance for business expansion. Since banks are special under this framework, increase in money supply from remittance recipient households can be channeled into micro enterprises (Adams & Page 2005, Acosta, Lartey & Mandelman 2008). Alternatively, remittances receipt could also be invested in human capital development by sending relatives to school (Udah 2011).

For inward remittance to affect economic growth however, two necessary conditions must hold. First, there must be a conducive business environment for small and medium businesses to grow. Second, educated citizens should be encouraged to stay back and be ready to work in their home country. This is because if educated members of remittance recipient households emigrate, in search of “greener pastures”, it could result in brain drain. Given these theoretical conditions for the existence of investment channel, the issue of whether inward remittances affect economic growth in Nigeria is therefore an empirical one.

Though, a lot of studies (Woodruff & Zenteno, 2004; Fajenzylber & Lopez, 2007; Giuliano & Ruiz-Arranz, 2009) have empirically investigated the impact of remittances on output growth through financial development, it has been argued recently that it takes place under asymmetric information and therefore could generate moral hazard (Raju Markus & Kung- Woo 2009).

One of the arguments is that excess money supply growth from remittance inflows can put pressure on the prices of non tradable goods, which may generate inflationary tendencies in the economy and ultimately cause appreciation of real exchange rate (Acosta *et al.*,2007;; Rodrik, 2007; Barajas, Chami, Fullenkamp, Gapen & Montiel 2011). It has also been argued that well functioning financial markets, by lowering transaction costs may help direct remittances into investments that yield higher returns and therefore promote growth rates (Guiliano & Ruiz –Arranz, 2005).

While the above views are to a large extent tenable in the Asian countries and other emerging countries, the lack of extensive studies on the inward remittances transmission mechanism, coupled with the prevailing feature of Nigerian economy has made it difficult to draw conclusion on the macroeconomic impact of inward remittances .Given this backdrop, the research problem that need to be addressed in this study is to empirically ascertain how and to what extent Nigerian economic condition has been affected by massive inflows of inward remittances through the banking system.

1.1. Objectives

- a) Examine the effect of household inward remittances on economic growth of Nigeria
- b) Ascertain the impact of interaction between inward remittances and banking sector development on economic growth in Nigeria.

1.2. Hypotheses

Ho1: There is no significant relationship between household inward remittances and economic growth in Nigeria

Ho2: There is no significant relationship between the joint impact of inward remittances and banking sector development on economic growth in Nigeria.

The rest of this study is structured as follows: Apart from this introductory section, section two contains theoretical/conceptual framework, section three contains literature review, while section four and five contains result/discussion and conclusion and recommendation respectively

2. THEORETICAL/ CONCEPTUAL FRAMEWORK

2.1. Solow Growth Model

The impact of household inward remittances on economic growth can be analyzed in the standard Growth- Accounting Framework (Chami, Hakura & Montiel 2012).

Under this framework, capital stock can be decomposed into two: domestic capital and foreign capital stock as:

$$K_t = K_{dt} + K_{ft} \text{-----} \tag{2.1}$$

Specifying Augmented Solow Growth model (Solow, 1956) which states that economic growth is a function of stocks of capital, labour, human capita and productivity.

Incorporating domestic capital stock and foreign capital stock separately in a Cobb-Douglas production function (Cobb-Douglas, 1928).

$$Y_t = A_t K_{dt}^\alpha K_{ft}^\lambda L_t^\beta H_t^\psi \dots \dots \dots (2.2)$$

Where Y is the output growth, K_{dt} and K_{ft} represent domestic and foreign capital stocks respectively, L is the labour, H is the human capital stocks, and A is the total factor productivity (TFP). TFP is essentially growth that is not accounted for by increases in traditional inputs such a labour and capital and encompasses such as technology and finance.

Taking Natural logarithm and differentiating equation (2) with respect to time, we have

$$\text{Log}Y_t = G + \alpha \text{Log}K_{dt} + \lambda \text{Log}K_{ft} + \beta \text{Log}L_t + \psi \text{Log}H_t \dots \dots \dots (2.3)$$

α , β , λ and ψ represent the elasticity output of domestic capital stock, foreign capital stock, labour and human capital respectively.

Equation (2.3) is a fundamental Growth Accounting Equation, which decomposes the growth rate of output into capital accumulation, labour force growth and Total Factor Productivity. Prior studies have identified various ways through which remittances may affect output growth. First, remittances may enhance the efficacy of investment by improving domestic financial intermediation (Channeling Fund from savers to borrowers). A second way remittances may affect economic growth is through labour force participation (i.e. the percentage of people that is working or seeking work).

Inward remittances may also help GDP growth when financial markets are relatively underdeveloped. Barajas *et al.*,(2012) have shown how remittances can lead to real exchange rate appreciation, which can make exports from remittances – receiving countries less competitive. Consequent upon these, the econometric form of equation (2.3) is transformed thus:

$$\text{Log}Y_t = G_t + \alpha \text{Log} K_{dt} + \lambda \text{Log}K_{ft} + \beta \text{Log}L_t + \psi \text{Log}H_t + \mu t \dots \dots \dots (2.4)$$

Where, μt is an error term.

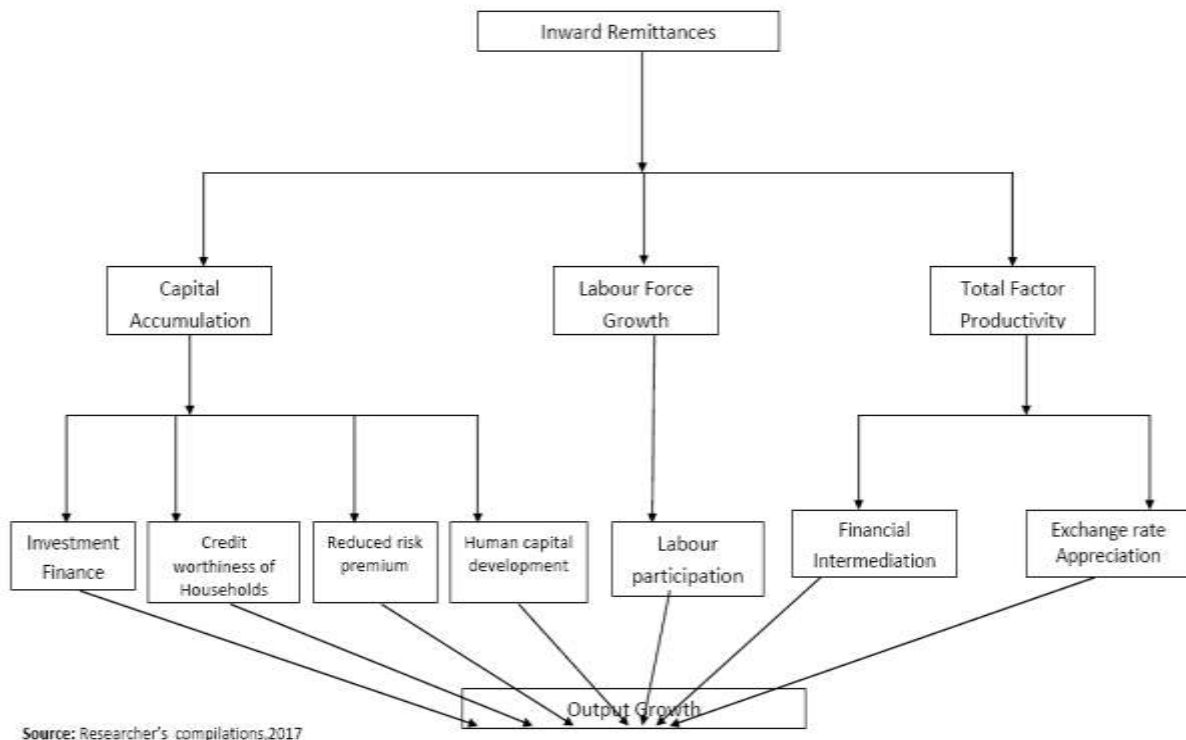


Figure1. A Schematic Diagram of the Channels through Which Household inward Remittance Affect Economic Growth

Source: Researcher’s compilations, 2017

2.2. Description of the Conceptual Model

Figure 1 depicts the conceptual model showing the channels through which inward remittances affect economic growth. It depicts a systematic model showing the three stages inward remittances transmit to impact on output growth to be primary, secondary final stages.

A more scientific way to aggregate the diverse theories of remittance – economic growth nexus is to adopt growth-accounting approach proposed by Solow (1956) in which the effect of remittances on output growth passes through three channels: capital accumulation, labor force growth, and total factor productivity (TFP). TFP is essentially growth that does not take into account increases in traditional factors such as labor and capital but recognizes such inputs as technology and finance.

2.2.1. Capital Accumulation

According to Ziesemer (2007), inward remittances can affect the rate of capital accumulation in domestic economies in various ways. First, inward remittances can directly finance productive investment. Remittance inflows can also stimulate the financing of investments by enhancing the creditworthiness of recipient households, by improving their capacity to borrow. Remittances can as well lower the interest rate charged by lenders by reducing risk premium component of interest rate.

It should however be noted that if remittances are perceived to be permanent income, recipient households may consume them instead of saving, thereby significantly reducing the amount of flows directed to investment. In fact, the amount of remittances channeled to investment has been found to be low. There are documented evidence that remittance flows into the Middle East and North Africa region increases the consumption of both locally manufactured and foreign goods, with meager amount allocated to investment. Besides, many households save part of the remittances by acquiring assets such as real estate, which does not increase the capital stock.

Inward remittances could help improve human capital development by enabling younger members of recipient households to continue schooling instead having to work and contribute to household income. For example, evidence from the Philippines and Mexico suggests that inward remittances lead to increased school enrollment. However, that addition knowledge gained would likely have little or no effect on domestic economic growth if it encourages the citizenry to emigrate in search of greener pastures.

2.2.2. Labor Force Growth

Inward remittances may also drag economic growth by affecting the rate of labor participation. A channel through which remittances could affect labor inputs is in labor force participation; the percentage of the population that is working or seeking work. But as has been noted, those effects can be negative. Remittances cause recipients to work less and still maintain the same living standard. Empirical evidence of this negative labor effort effect is numerous, and empirical studies have found this to be true. Thus, remittances appear to serve as a drag on labor supply.

2.2.3. Total Factor Productivity

Scholars such as Bettin and Zazzaro(2008); Noman and Uddin(2011); have also identified two other main channels through which inward remittances can affect the growth to be total factor productivity. First, remittances can promote the efficacy of domestic investment by deepening domestic financial intermediation by channeling funds from savers to borrowers. That is, they may affect the ability of the recipient economy's formal financial system to allocate capital between lenders and borrowers. For example, remittances can promote economic growth where the formal financial system is weak by relaxing the credit constraints imposed on households by a fragile banking system. In addition, irrespective of the state of the financial sector's development, remittances are likely to boost the volume of funds flowing through the banking system. This, in turn, may lead to enhanced financial development and thus to higher economic growth through increased economies of scale in financial intermediation.

Secondly, inward remittances could affect economic growth through the exchange rate mechanism. Barajas *et al.*, (2011) explained how remittances can cause real exchange rate appreciation, which in turn can make exports from remittance-receiving countries less competitive. The companies that produce export goods may be transferring technical know-how to the rest of the economy or providing

opportunities for other local companies to improve the value chain. This has been found to be the case, especially with manufacturing sector. However, if these companies products become less competitive in the international market as a result of exchange rate changes, then these firms may scale back or close shop, and their beneficial impact on productivity is diminished.

2.3. Empirical Review

Inward remittances have become one of major sources of foreign exchange earnings to developing countries and there are concerns as to whether it can stimulate economic growth in recipient economy. To this effect, financial economist have focused extensively on the potential developmental impact of inward remittances and most importantly the channels through which inward remittances transmit to real sector of the economy. In view of these developments

Glystos (2005) constructed a Keynesian model with a dynamic perspective anchored on a sound theoretical basis to investigate the relationship amongst investment, imports and output. The model estimated short-run and long-run multiplier effect of exogenous shocks of remittances on macroeconomic variables using time series data from five Mediterranean countries. The study also revealed that there are good cases where remittances promote growth, or moderate recession, and bad cases where remittances retard growth or promote recession, but the good cases are generally more than the bad cases.

Catrinescu, *et al.*,(2006) contributed to the raging debate regarding the relative contributions of international migrants' remittances to sustainable economic development. The authors lamented that theoretical and empirical investigations into remittance-economic growth nexus have consistently produced mixed results. They recognized the findings of some scholars that remittances impact on growth by providing capital to remittance households and that for a number of countries, migrant remittances promote growth by increasing national disposable income. The above remittance success story notwithstanding, some studies found that remittances can present deleterious impact on national economic growth in the medium and long term. The authors aligned with this school of thought by stating that remittances can fuel inflation, appreciate exchange rate and reduce labour market participation. Result from their showed that remittances appear to have positive and significantly impact on growth in five out of nine specifications. Dynamic panel data analysis reports positive and significant effect of remittances on economic growth, implying the importance of robust institutional framework in remittances economic growth nexus.

Bettin and Zazzaro (2009) in their study, noted that while the economic growth effect of remittances is not in doubt, what is not clear yet is the channel through which channel remittances impact growth. The authors acknowledged empirical debate about the substitutability or complimentary of financial market in remittances-economic growth nexus. The authors stated that apart from removing liquidity constraints and facilitating access to credit for the migrant's relatives, remittance inflows, if efficiently intermediated should allow the funding of growth enhancing projects. In this study, the authors introduced institutional quality indicators such as banking efficiency, corruption, regulatory quality, rule of law, accountability, political stability and government effectiveness to traditional quantity indicators employed by Giuliano and Ruiz-Arranz. In their panel data estimation of 66 developing countries for the period 1970 to 2005 using data sourced mainly from WDI and Bankscope database (Fitch-IBCA) for the period 1991 to 2005. Empirical evidence from the study showed that an efficient banking system complements the positive effect of remittances on GDP growth. Result showed that remittance inflows not only relax liquidity constraints and guarantee access to credit, but also contribute, when mediated by an efficient banking system, to funding growth enhancing projects.

Jawaid and Raza (2012) examined the relationship between workers' remittances and economic growth in China and Korea. Using annual time series data covering 1980 to 2009, these authors adopted Johansen and Jesuselius's cointegration technique, error correction model, and sensitivity analysis to analyze short run and long run relationships. Empirical evidence from the study indicate that, indeed there exists a significant positive long run relationship between remittances and economic growth in Korea, while a significant negative relationship was found between remittances and economic growth in China. In addition, the Error Correction Model (ECM) confirmed significant positive short-run relationship between remittance and economic growth of Korea. Causality analysis indicates unidirectional causality running from workers' remittances to economic growth in both countries

In a similar study, Jawaid and Raza (2012) re-examined the relationship between workers' remittances and economic growth by employing new long time series data of South Asian countries of Pakistan, India, Bangladesh, Sri Lanka and Nepal. The authors employed the general production framework of the form:

$$Y = f(A, L, K)$$

Where Y is gross domestic production, L is total labor force and K is the stock of capital. In the framework, A captures the total factor productivity effect on output growth. It is however postulated that workers' remittances (R) will operate through A.

The above model was transformed into econometric model for the purpose of empirical estimations as follows:

$$Y_t = \beta_0 + \beta_1 L_t + \beta_2 K_t + \beta_3 R_t + \varepsilon_t$$

Where ε_t is the error term.

The authors hypothesized that positive sign is expected for K and Y, while that of R and L is to be ascertained. Employing co integration and causality analyses on time series data from 1975 to 2009, result confirm the existence of positive long run relationship between remittances and economic growth in India, Bangladesh, Sri Lanka and Nepal, while, significant negative relationship was found between remittances and economic growth in Pakistan. Causality analysis from the study also confirmed bidirectional causality between remittances and output growth in Nepal and Sri Lanka. On the contrary, unidirectional causality, that runs from remittances to economic growth was discovered for the case of Pakistan, India and Bangladesh.

Iqbal and Satter (2005) examined whether or not workers' remittances contributed to economic growth in Pakistan using time series data for the period 1972/73 to 2002/03. The authors constructed a simple behavioural growth model that incorporates real GDP growth and other explanatory variables similar to those used by Chami *et al.*, (2005). In order to eliminate some econometric problems that could bias the result, some of the variables were normalized by GDP, in addition to testing for stationarity of variables. Empirical result from the study showed a positive and highly significant relationship between workers' remittances and real GDP growth. In specific terms, a percentage point increase in remittances result into 0.4 percentage point increase in GDP growth, a percentage point increase in public investment culminates to 0.6 percentage point increase in GPP growth rate. Similarly, a percentage point increase in private investment would result into 0.9 percentage point increase in GDP growth to Pakistani economy.

Fayissa and Nsiah (2008) explored the aggregate impact of remittances on the economic growth of Sub-Saharan African countries with the conventional neoclassical growth model, using panel data spanning from 1980 to 2004. Corroborating the views of Catrinescu *et al.*, that remittance - economic growth nexus is understudied, the authors however attributed the sobering state of remittance - economic nexus studies to belief in some quarters that remittances are widely used by recipients for consumption purposes and, hence have minimal impact on investment. On the contrary, other researchers argue that the use of remittances for consumption can still have positive effect on remittances through multiplier effect. Employing Arellano-Bond dynamic GMM estimator, to control for endogeneity, findings from the study showed that the coefficients of the lagged values of GDP per capita (PCI) and changes in remittances (REM) have a significant positive impact on the growth rate of African GDP per capita. In specific terms, a 10% increase in remittances lead to a 0.3% increase in the GDP per capita income.

Okodua (2010) in his thesis investigated the economic growth and developmental role of workers' remittances in selected Sub Saharan Africa (SSA) countries. Using data from 2000 – 2007 for twenty one SSA countries to estimate the links between remittances and output growth, the result of the study based on the system generalized method of moments (GMM) that allows for country and year specific fixed effects showed that; (i) Workers' remittances have an insignificant negative impact on output growth in SSA; which the author interpreted to mean that a greater percentage of remittance inflows are channeled to unproductive uses; (ii) Workers remittances exert significant negative impact on investment. Finally, Workers' remittances exert significant negative effect on external trade balance

Kure and Nwosu (2008) discussed the imperative of remittance inflows into the Nigerian economy in view of significant improvement in Diaspora resource flow over time, an estimated growth of about 657% between 2002 and 2007. According to the authors, the major drivers of remittances in Nigeria are: (i) return to democratic rule in 1999; (ii) renewed confidence of Nigerians migrants in the country's home grown policy of the federal government; (iii) great investment opportunities presented by the economic reforms, particularly in banking, (iv) re-introduction of FGN bonds; and (v) rising share of remittances income as a result of growing number of Nigerian professionals. Employing the simultaneous equation system in regressions of economic growth and its determinants based on a two stage Least Square Instrumental Variable (2SLSIV) approach they found a positive impact of remittance on economic growth in Nigeria through investment in private and human capital, with a pass through effect on private consumption.

Olowa and Awoyeni (2012) extended the debate about how remittances are spent or used and their impact on economic development using the Nigeria Living Standard Survey 2004 datasets. The authors noted that while prior studies have focused on the impact of remittances on household investment in Nigeria, empirical study on the effect of remittances on household expenditure is lacking, which prompted the need for this present study. Empirical findings from this study produced three startling revelations, first, that contrary to other studies, it was revealed that majority of remittance earnings are spent on consumption goods; second, that the marginal spending behavior of households receiving remittances is qualitatively different from that of households which do not receive remittances; third, that at the margin, households that receive domestic and international remittances spend 15.3% and 2.2% respectively, on housing than households that do not receive remittance

Ukeje and Obiechina (2013) examined the impact of workers' remittances on economic growth in Nigeria where remittance according to the authors have become an important source of foreign financial flow both in size and growth rate. The authors analyzed whether remittances have any long term effects on economic growth, in view of unprecedented growing level of remittance in the current account of the Nigeria's balance of payment (BOP). They noted that since remittances are unrestricted private financial flows that could conveniently finance investment and consumption of Nigerians, an empirical inquiry into its impact on the economic growth process of Nigerian economic would avail policymakers the much need information of how best to optimally harness its long term benefits. In the final analysis, the study found convincing evidence of positive influence of remittances on economic growth process of Nigeria.

Akinpelu, Ogunbi, Bada and Omojola (2013) investigated the relationship between remittance inflows and economic growth in Nigeria. The authors adopted co integration and causality tests to analyze time series data ranging from 1991 to 2011 obtained from World Bank data based and Central bank of Nigeria websites. Empirical result from co integration test indicate a long run equilibrium relationship between GDP and remittance inflows, exchange rate, foreign direct investment, openness and capital formation. The result of causality test revealed a unidirectional causality from GDP to remittance inflows, and openness.

Sani and Hassan (2015) utilized aggregate time series data of remittances on the Nigerian economy. In this study, the authors adopted the so-called GMM approach in which the endogeneity problems and unobservable effect were controlled. The GMM result showed that remittances exert positive and significant relationship with GDP growth. Besides, remittance was also found to play active role in explaining the economic growth process of Nigeria. In addition to the above, the study also found that financial dept and trade openness exert positive and significant effect on economic growth in Nigeria. In the light of several literatures on the impact of remittances on economic growth, Odionye and Emerole (2015) further reexamined the impact of international remittances on the Nigerian economy. This study, according to these authors became relevant due to the potential role well functioning financial market will play in lowering costs of transactions that will help direct remittances to project that yield highest returns and therefore enhance financial sector development. The authors estimated long run relationship among the variables. Moreover, upon the realization that all the variables were

stationary at first difference, that is, integrated of order one 1(1), a co-integration test using Engle Granger procedure was adopted. Co-integration test however confirmed existence of long run relationship among the variables. Consequent upon the above, an Auto Regressive Distributed Lag (ARDL) was also estimated. The findings which emerged from the ARDL revealed that international remittance have positive and significant impact on the Nigerian economy. Specifically, a dollar increase in remittances inflows into Nigeria will increase GDP by 0.1 billion naira through household consumption and private investment; exchange rate has positive and significant impact on the Nigerian economy; interest rate has negative and significant impact on financial sector development

Review of empirical literature could not provide a conclusive evidence about the relationship amongst household inward remittances, banking sector development and output growth especially in emerging economy like Nigeria. It therefore becomes imperative that a study of nature be carried out to discover the missing link(s) among these phenomenon.

3. METHODOLOGY

3.1. Model Specifications and Definition of Variables

There are divergent scholarly opinions as regards the impact of remittance inflows on long-term economic growth of recipient economy. It is therefore imperative to investigate whether remittances have any long term effects on economic growth of Nigeria.

$$\text{LOGGDP}_t = \beta_0 + \beta_1 \text{LOGGDP}_{t-1} + \beta_2 \text{LOGREM}_t + \beta_3 \text{LOGCPS}_t + \beta_4 \text{LOGINV}_t + \beta_5 \text{POP}_t + \beta_6 \text{LOGSECNR}_t + \beta_7 \text{LOGFINC}_t + \beta_8 \text{LOGOPEN}_t + \mu_{t2} \dots \dots \dots (3.1)$$

Meanwhile, there are opposing views about the role of banking sector development in the remittance - economic growth nexus. While some scholar opined that remittances substitute for shallow financial system by providing finance to capital starved businesses, other posit that remittance complement financial system, implying that remittance promote growth in a developed financial system than shallow financial system. In order to empirically test this hypothesis in Nigeria, model 3.2 is formulated thus:

$$\text{LOGGDP}_t = \psi_0 + \psi_1 \text{LOGGDP}_{t-1} + \psi_2 \text{LOGREM}_t + \psi_3 \text{LOGCPS}_t + \psi_4 \text{LOGINV}_t + \psi_5 \text{POP}_t + \psi_6 \text{LOGSECENR}_t + \psi_7 \text{LOGFINC}_t + \psi_9 \text{LOGOPEN}_t + \psi_{10} \text{LOG}(\text{REM} * \text{CPS})_t + \mu_{t2} \dots \dots \dots (3.2)$$

Where, LOGGDP is the natural logarithm of gross domestic product; LOGGDP_{t-1} is the natural logarithm of one year lagged gross domestic product; LOGREM is the logarithm of household inward remittances; LOGCPS is the natural logarithm of credit to private sector; LOGINV is the natural logarithm of productive investment; POP is the population growth rate; LOGSECENR is the natural logarithm of secondary school enrolment; LOGFINC is the natural logarithm of foreign direct investment; LOGOPEN is the natural logarithm of trade openness; LOG(REM * CPS) is the natural logarithm of interaction between household inward remittances and credit to private sector; ψ₀ is the intercept; ψ₁ – ψ₁₀ are the parameters to be estimated; μ_{t3} is the error term

3.2. Time Series Properties of Data

3.2.1. Unit Root Test

Table 2 showed that the null hypothesis that a variable under investigation has a unit root, against the alternative that it does not, cannot be rejected for all the data series in their levels at either the 1% and 5% significance level. Having taken the first difference of all the series, the ADF and PP test was further employed in testing for the stationarity of these differenced series.

The series tested are: LOGGDP, LOGREM, LOGREM, LOGCPC, LOGINV, POP, LOGSECENR, LOGOPEN, LOG(REM*CPS), INF, LOGLENR, LOGREER, & LOGFINC.

The result indicates that some of the variables are stationary at level: LOGCPS, LOGFINC and INF while LOGGDP, LOGREM, LOGINV, POP, LOGSECENR, LOGOPEN, LOG(REM*CPS), LOGLENDR and LOGREER are non stationary at level, but however become stationary after first difference (1).

Table1. Unit Root Test

Variable	ADF ILAG)			PP*(3Lags)	
	With constant (No trend)	With constant & Trend	With constant (No trend)	With constant & trend	d*
LGDP	0.0996	-1.1964	0.0289	-1.1964	1(1)
ΔGDP	-5.6151	-5.8907	-5.6757	-6.7457	
LREM	-1.2978 ⁷ -9.8686	-1.4751	-1.9022	-2.7758	1(1)
ΔLREM		-9.7885	-9.8686	-9.7985	
LCPS	-3.7677	-3.7557	-3.6187	-3.5387	1(0)
ΔLCPS	-	-	-	-	
LINV	-2.6745	-2.4668	-2.5170	-2.2038	1(1)
ΔLINV	-6.7618	-7.4204	-6.7849	-9.7470	
POP	-2.0340	-2.0095	-2.1312	-1.9576	1(1)
ΔPOP	-4.8317	-5.6461	-4.8289	-5.6792	
LSECENR	-3.8720	-3.2114	-3.5267	-3.1696	1(1)
ΔLSECENR	-3.8210	-4.0340	-3.7222	-3.9680	
LFINC	-6.6830	-6.3606	-6.2479	-6.3871	1(0)
ΔLFINC	-	-	-	-	
LREMCPS	-1.8279	-2.4897	-1.8004	-2.4897	1(0)
ΔREMCPS	-7.1707	-7.1259	-7.0665	-7.0231	
MCKINNON CRITICAL VALUES: LEVEL					
1%	-3.5253 -2.9029	-4.0928 -3.4739	-3.5239 -2.9023	-4.0909 -3.4730	
5%	-3.5267 -2.9035	-4.0948 -3.4749	-3.5233 -2.9029	-4.0928 -3.4739	

Source: Authors Computation from E-views, 2016.

NOTES: ADF, PP, d * denotes Augmented Dickey Fuller, Phillips-Perron test and decision about the order of integration, respectively.

3.2.2. Co-integration Test

The co-integration test were undertaken based on Johansen and Juselius (1990) maximum likelihood framework. The essence of this is to empirically establish whether long run relationship exist among the variables. It is establish in literature that multi co integration extends the co-integration technique beyond two variables, and this also applies to variables integrated at different orders, (Hatemi, 2008).

Table2. Co integration Rank Test

VARIABLES: LGDP, LREM, LCPS, LINV, POP LSECENR, LFINC, LOPEN, LREM*CPS

Null Hypothesis	Trace Statistics	Critical value @5%	Null hypothesis	Max Eigen statistic	Critical value @ 5%
None*	414.8209	197.3709	None*	117.0326	58.4335
At most 1*	297.7884	159.5297	At most 1*	109.5400	52.3626
At most 2*	188.2483	125.6154	At most 2*	83.8373	46.2314
At most 3*	104.4110	95.7536	At most 3*	46.0352	40.0775
At most 4	58.3757	69.8188	At most 4	20.9199	33.8768
At most 5	37.4558	47.8561	At most 5	17.4913	27.5843
At most 6	19.9645	29.7970	At most 6	13.0232	21.1361
At most 7	6.9413	15.4947	At most 7	5.5143	14.2646
At most 8	1.4269	3.8414	At most 8	1.4269	3.8414

Source: Authors computation from E-views7, 2017

NOTE: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

The results of the cointegration test shows that there are 4 cointegrating vectors in the model . The trace statistic and maximum eigen statistic arrive at the same conclusion and similar cases exist in literature.

Table3. Descriptive Statistics

	Dlogrem	DloggdP	Dlogcps	Dloginv	Dpop	Dlogsecenr	Dlogfinc	Dlogopen	dlogRem*cps
Mean	-0.2689	22.1194	1.7732	1.6556	2.2993	2.2107	2.9005	2.6205	2.3550
Median	0.5910	21.9782	1.7247	1.6084	2.2996	2.2018	2.9130	2.6812	3.0856
Maximum	2,2533	22.8975	2.4791	2.3560	2.5650	2.5615	3.1098	2.9956	5.3602
Std Dev	1.7398	0.3771	0.2733	0.3519	0.1055	0.1864	0.1005	0.2588	2.0448
Skewness	-0.3526	0.8828	1.0070	0.4860	1.10801	-0.5615	-0.3962	-0.6339	-0.3096
Kurtosis	1.5862	2.3355	3.8455	2.5200	3.4018	4.1121	3.5729	2.5628	1.5933
J-B	3.5358*	5.1076**	6.7594**	1.6649*	7.1861	3.5396*	1.3549*	2.5478*	3.3464*
Obs	34	34	34	34	34	34	34	34	34

Source: Author's Computation from E-Views7, 2017.

Note: Critical values of X2 at 5% and 1% levels are 5.99 and 9.21 respectively, *(** *) denotes acceptance of the null hypothesis that variables are normally distributed at the 5% (1%) significant level.

It could be observed that the distributions of the series in table 1 are nearly symmetrical Skewness and Kurtosis provide information about the symmetrical nature of the probability distribution of the various data series as well as the thickness of the tails. These two statistics are particularly important as they are used in computing the Jarque-Bera statistic and also used for testing the normality or asymptotic properties of data series.

The result of time series properties of the series; unit root, co integration and descriptive statistics lead to adoption of Generalized Method of Moment (GMM).

3.3. Dynamic Specification Remittances

The Generalized Method of Moment (GMM) proposed by Hansen (1982) is adopted for this study. The GMM estimator is more robust and dynamic, as it allows the regressor variables to depend on its past values. The attractiveness of GMM over other estimators like Ordinary Least Squares (OLS) and two stage Least Squares (2SLS) is the possibility of obtaining consistent point estimates in the presence of heteroscedasticity, serial correlation and non linearity (White, 1984; Newey & West, 1987). The 2SLS uses a weighting matrix constructed under homoscedasticity while GMM estimator allows for the parameters to be over- identified (Craig, 1983).

Following this a general linear regression model is specified as:

$$Y_i = X_i^1 \beta + \mu_t \dots \dots \dots (3.3)$$

The OLS estimator $\beta = \sum X_t^2$ is consistent

For β given $E(u_t/x) = 0$

A regression model with the first lagged dependent variable as a regressor can be specified from equation (5) as:

$$Y_i = y_{t-1}^1 \beta_1 + X_t^1 \beta_2 + \mu_t \dots \dots \dots (3.4)$$

The model in equation (6) is a dynamic model chosen for parsimony and one lagged value of y_{t-1} provides the current information about y_t . The regression errors μ_i though uncorrelated with x_t but are correlated with y_{t-1} , the past value of y_t . The correlation leads to OLS estimator being inconsistent for β . The GMM estimator as proposed by (Hansen, 1982) therefore becomes consistent for β .

An instrument variable Z that is correlated with y_{t-1} and uncorrelated with y_t gives consistent estimation. This implies that $E(u_t/Z) = 0$, which gives the moment condition or population zero – correlation as:

$$E[Z_i^1 (y_i - x_i \beta)] = 0 \dots \dots \dots (3.5)$$

Given equation (7) the models used for this study are specified as:

$$DP_t = \alpha + \beta_1 DP_{t-1} + \beta_2 ID_t + \beta_3 Z_t + \mu_t \dots \dots \dots (3.6)$$

Where DP is the dependent variable at time t , α is the constant term, DP_{t-1} one past value of the dependent variable, ID is independent variable, Z is the vector of control variables, β are parameters to be estimated and μ is the error term.

4. RESULTS AND DISCUSSION

Table 4 presents the GMM result of the impact of inward remittances on economic in Nigeria. Result show that the model is well behaved as indicated by R-squared of 0.96, The implication of this is that 96% change in the economic growth process of Nigeria can be explained by the independent variables, one period lagged of DLGDP, inward remittances as a ratio of GDP (DLGDP), credit to private sector as a ratio of GDP (DLCPS), investment measured as a ratio of gross capital formation to GDP (DLINV), population growth rate (DPOP), human capital development proxied by natural logarithm of secondary school enrollment as a share of GDP, consumption measured as a ratio of final consumption expenditure to GDP (DLSECENR) and degree of openness.

Table4. *Impact of household inward remittances on economic growth*

Instrument specifications: DLGDP(-3), C, DLGDP(-2) DLREM(-1), DLCPS(-1), DLINV(-1), DPOP, DLSECENR(-1), DLFINC(-1), DLOPEN(-1)

Explanatory Variables	Dependent variable: DLGDP			
	Coefficient	Std error	t-statistic	Prob.
C	8.5235	7.0446	1.2099	0.2386
DLGDP(-1)	0.4610	0.3732	1.2350	0.2293
DLREM	0.0824	0.0685	1.2030	0.2412
DLCPS	-0.1971**	0.0911	-2.1615	0.0413
DLINV	0.1608	0.1664	0.99677	0.3437
DPOP	0.7878	0.8092	0.9735	0.3404
DLSECENR	0.7380**	0.2972	2.4830	0.0208
DLFINC	-0.0354	0.4091	-0.0865	0.9317
DLOPEN	0.0637	0.0747	0.8524	0.4027
Diagnostic statistics				
R-squared	0.96			
Adj. R-squared	0.94			
Durbin Watson Stat.	2.50			
J-statistic	0.00			

Source: Authors computation from E-view 7, 2017

Note ***, **, * denotes significance at 1%,5% and 10% respectively.

Result show that the coefficient of one year lagged value of GDP is positively related to current year output growth but statistically insignificant. Similarly, the coefficient of inward remittances is positively related to economic growth but also statistically insignificant. The coefficients of investment, population growth rate, human capital development and trade openness are positively related to output growth but statistically insignificant, with the exception of human capital development that is found to be statistically significant at 1% level. On the contrary, credit to private sector and consumption are negatively related to economic growth. However, credit to private sector is statistically significant at 5% level while consumption coefficient is not statistically significant at 5% level.

Table 5 presents the joint effect of inward remittances and banking sector development on economic growth in Nigeria. A cursory look at the estimated result in table 4.12 shows that about 91% change in economic growth can be explained by the independent variables, remittances, credit to private sector, investment, population, human capital investment, consumption, trade openness, interaction of remittances with banking sector development and one year lagged of economic growth. The high R-squared shows that the model has a good fit.

Result shows that the coefficient of inward remittances is positive and statistically significant at 5% level. The implication is that holding other variables constant, a percentage change in remittance inflow will result in 0.33 percentage change in economic growth in Nigeria.

The coefficients of investment, population growth rate, consumption and one year lagged of economic growth are positive but statistically insignificant. The positive coefficients reported are consistent with our a priori expectations. On the contrary, the coefficients of credit to private sector and trade openness are negatively related to economic growth but statistically insignificant. These findings are inconsistent to our a priori expectation.

Table 5. *Impact of Household inward remittances and banking sector development on economic growth*

*Instrument specifications: DLGDP(-3), C, DLGDP(-2) DLREM(-1), DLCPS(-1), DLINV(-1), DLPOP, DLSECENR(-1), DLFINC(-1), DLOPEN(-1), DLREM*CPS(-1)*

Independent Variables	Dependent variable: DLGDP			
	Coefficient	Std error	t-statistic	Prob.
C	11.2041	8.3245	1.3459	0.1920
DLREM	0.3366**	0.1661	2.0254	0.0551
DLCPS	-0.1051*	0.0534	-1.9965	0.0620
DLINV	0.2294	0.2090	1.0976	0.2842
DPOP	2.9563	2.0228	1.4615	0.1580
DLSECENR	0.7276**	9.3372	2.1578	0.0421
DLFINC	0.5505	0.3664	1.5021	0.1473
DLOPEN	-0.2945	0.1842	-1.5986	0.1242
DLREM*CPS	-0.1690**	0.0703	-2.4021	0.0252
DLGDP(-1)	0.2697	0.4482	0.6017	0.535
Diagnostic statistics				
R-squared	0.91			
Adj. R-squared	0.87			
Durbin Watson Stat.	2.39			
J-statistic	0.00			

Source: Authors computation from E-view 7, 2017

Note ***, **, * denotes significance at 1%, 5% and 10% respectively.

The coefficient of human capital is positively related to economic growth and statistically significant at 5%. Specifically, result indicate that holding other variables constant, a Percentage change in secondary school enrollment will culminate in 0.72 percentage change in economic growth. Interestingly, the coefficient of interaction between inward remittances and credit to private sector is negatively related to economic growth and statistically significant at 5% level.

Table 4 report the GMM estimate of economic growth model in Nigeria without interaction of banking sector variables with remittance. Result showed that inward remittances have made negligible positive contribution to economic growth in Nigeria. This result is consistent with the earlier findings by Agu (2009), Ukeje and Obiechina (2013), Kanu and Ozurumba (2013) but in contrast with the findings of Barajas et al (2009), Raju *et al.*, (2010).). Clearly, the debate about the effect of inward remittances on output growth is still inconclusive. Scholars such as Abdih, Ralph, Dagher and Montiel (2012), Catrinescu *et al.*, (2006) who have found positive contribution of remittance inflows on economic growth predicated it on efficiency of recipient country institutions. Guiliano and Ruiz-Arranz (2009) emphasized the role of banking institution and investment climate in unlocking the potential of inward remittances in promoting economic growth. Chami *et al.*, (2012) suggested a useful approach to exploring the channel of transmission to be Growth Accounting approach in which the effect of remittance on output growth may be through capital Accumulation, Labour Force Growth and Total Factor productivity (TFP) growth. According to Chami *et al.*, (2012), remittance can directly finance investment by improving the creditworthiness of households. But if remittances are perceived as permanent income, recipient households may consume them rather than invest.

Researchers have also identified remittance to affect the ability of the recipient economy’s formal financial system to allocate capital to productive investment. In view of the above, we interacted banking sector variables with remittance inflows (REM* CPS). Researchers postulated that positive interaction term would imply that banking system complements remittances to enhanced economic growth, while a negative sign implies that recipients substitute remittances recipients for bank credit facilities. Table 5 shows that remittances inflows have compensated for lack or inefficiency of the banking system and have also helped in channeling finance to capital starved businesses. Based on these results, we can safely conclude the inward remittances have de facto acted as substitute for

financial services in promoting economic growth in Nigeria. This result is consistent with the findings of Guiliano and Ruiz-Arranz (2009); Barajas *et al.*, (2009).

5. CONCLUSION AND RECOMMENDATION

Inward remittances are now global phenomenon and there has been scholarly debate on the developmental impact of inward remittances on banking sector development, economic growth, saving, investment, consumption, inequality, poverty reduction and human capital development. However, there are concerns as to whether or not remittances could have significant and positive impact on economic growth in Nigeria. Empirical evidence on the impact of inward remittances on banking system and real economy is scanty and provides mixed results. Few studies have been carried out to examine whether inward remittances affect economic growth. Some suggested that remittances affect economic growth through exports or financial development process of the recipient country.

This study examined the missing link among household inward remittances, banking sector development and economic growth in Nigeria. The study also explored the channels through which inward remittances transmit to promote economic growth in Nigeria using Generalized Method of Moment (GMM) estimator proposed by Hansen (1982).

The study reveals that household inward remittances made positive impact on economic growth in Nigeria, though the impact is negligible considering the huge amount of remittance inflows into the Nigerian economy. This finding is consistent with conclusion reached by earlier writers on this topic including Agu (2009), Guiliano and Ruiz-Arranz (2009), Ukeje and Obiechina (2013), Kanu and Ozurumba (2013) amongst others.

This study therefore concludes that remittances substitute for shallow financial system in Nigeria by relaxing liquidity constraint of potential and existing entrepreneurs and also enhancing allocation of funds to capital starved businesses in Nigeria. This is revealed by the negative relationship between the interaction of inward remittances and banking sector development (REM*CPS). Based on the above expositions, it is therefore recommended that Nigerian banks develop and market remittance-linked financial products to remittance remitter and recipient households rather than serving as mere cash centers of western money supply and money gram without value addition.

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