# Workers' Remittances and Financial Sector Performance: The Nigerian Experience

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*This study examined the direction and magnitude of remittances effect on financial development in Nigeria. Using DMB deposit, credit, loan and liquidity to proxy for financial development, and adopting a structural dynamic model, we found that workers' remittances show a sign of positive effect on demand deposit, positive and significant effect on liquidity and positive and significant effect on DMB credit and loan. This implies that workers' remittances in Nigeria are important drivers of financial deepening. Thus, effort at making saving attractive and reducing parallel market premium will unarguably raise the proportion of banked remittances and improve financial development.*

**Key words:** Workers' remittances, international migration, financial development, structural dynamic model, loan portfolio, deposit money bank, foreign exchange inflow

**JEL:** D13, D64, G21

## I. Introduction

Workers' remittances, defined as the share of migrants' income repatriated to the relatives back home appears to be attracting attention in the research and policy circle. The reason for this may partly be explained by its rising volumes in the last two decades, improved ways of remitting and, perhaps, because of its impact on the receiving

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countries. Remittances to developing countries rose from US$2.98 billion in 1975 to US$90 billion in 2003[1]. By 2005, the amount has risen to about US$188 billion and by 2008 it has increased by more than 60% of 2005 value (World Bank, 2009). Remittances appear to be a significant source of foreign exchange inflows, surpassing the amount of official development inflow and portfolio investment. In the aggregate, remittances are currently the second largest source of foreign capital inflows both in terms of growth and intensity in Gross Domestic Product (GDP). In some developing and less developed economies, workers' remittances (or simply remittances) account for more than 10% of GDP. Because of the increase in inflow coupled with how intensive it is in economic activities of some countries, scholars have begun to examine the possibility of and channel through which remittances may likely affect the economies of the receiving countries.

Received evidence from cross-country studies appears inconclusive. On the one hand, remittances lower economic growth through moral hazard. In this case, remittance receivers pretend as if they are unemployed whereas they do not search for work (Chami, Fullenkamp, and Jahjah, 2003; Azam and Gubert, 2005). Conspicuous spending can also be linked to this moral hazard in the sense that some remittances receivers tend to use the money to buy goods that are not produced in the country, thus, increasing import outlay of the country. This implies that the same community characteristics that led to migration also

[1] This amount is an official report, and constitutes just 50% of the actual amount remitted. The rest 50% is argued to have been remitted through informal channel (World Bank, 2006)

dampen the productive use of incoming remittances (Caceres and Saca, 2006). On the other hand, some scholars argue that remittances significantly reduce inequality and poverty, increase per capita income, and human capital. Thus, remittances have long-run positive impact on growth and development. In another development, remittances may not a have direct positive impact on growth, but do so indirectly, particularly through investment, in which case, remittances substitute for or improve access to credit and through this transmission mechanism, affect economic growth (Giuliano and Ruiz-Arranz, 2005; Toxopeus and Lensink, 2006). Conversely, huge and continuous infow of remittances can worsen financial development of the receiving countries. It follows that there is no unanimous agreement on how remittances affect financial development of the receiving country, even though financial development has been agreed to strongly and positively affect economic growth.

On the one hand, remittances partially offset lack of financial development in emigration countries by allowing poor people to invest in high-return projects despite their difficulties to obtain credit. On the other hand, remittances and financial development foster one another. In other words, while a higher degree of financial development allows migrants to send money home faster, safer and above all cheaper, large amounts of remittances stimulate the interest of financial institutions and public authorities, bringing about higher levels of competition between financial intermediaries, as well as institutional reforms aimed at channelling remittances towards productive investment. The

worsening impact of remittances on financial development stems from the fact that since remittances can relax individuals' financing constraints, they might lead to a lower demand for credit and have a dampening effect on credit market development. Also, a rise in remittances might increase credit to the private sector particularly if banks are reluctant to lend and prefer to hold liquid assets. Another dampening effect is a situation in which received remittances are immediately consumed, held in foreign currency, or use another means to save, if saving it in banks is fraught with high risk.

Unfortunately, beyond anecdotal report, little attention has been given to the role remittances play in financial development of the receiving countries, most especially in Sub-Saharan Africa, and particularly in Nigeria[2]. However, given the fact that financial institutions of a country are the lifeblood of economic activities as evident from their role in fostering growth and reducing poverty, and the fact that financial development performs key economic functions, it is important to examine the role played by remittances in financial development in Nigeria. In particular, the issue that remains unresolved is to what extent has remittances improved or worsened financial development? Providing an answer to this question will help policymakers, particularly in the financial sector, to take cognizance of this important source of foreign exchange inflow when using financial policy instruments.

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[2] Orozco and Fadewa (2005) present reports on the efforts of financial institutions to make remittances bankable. Orozco (2007) reviews how financial institutions in Nigeria strive to attract remittances. Gupta, Partilo and Wagh (2007) examine the case of Sub-Saharan Africa.

The remainder of the paper is structured as follows: section two presents literature review while section three discusses some stylized facts about remittances in Nigeria. Section four discusses the methodology adopted for the study and section five presents the result of our findings while sections six and seven provide summary and conclusion, and policy recommendations, respectively.

## II. Literature Review

There are two schools of taught in discussing the relationship between remittances and financial development. The first school of thought argues that remittances substitute for sound financial development. The second school of thought opines that remittances tend to drive financial development. The substitutability hypothesis puts forward the idea that remittances partially offset the lack of financial development in emigration countries, by allowing poor people to invest in high-return projects despite their difficulties to obtain credit. According to Ambrosius (2006), when lack of foreign currency is the bottleneck of development, remittances can provide developing countries with foreign currency that could be used for investment and the import of capital goods. Other than private lending, remittances are like a "gift" or "manna" from abroad and can ease the foreign exchange constraint without creating liabilities in the future. What this turns out to mean is that remittances can reduce dependency on foreign currency and finance a current account deficit as long as the country keeps receiving them.

The main arguments in favor of the substitutability hypothesis are presented by Giuliano and Ruiz-Arranz (2005), who analyzed the respective roles of remittances and the financial sector in promoting economic growth through investment. They show in their model that the impact of remittances on growth is stronger when financial markets are under-developed. By contrast, a high degree of financial development reduces the role of migrants' transfers in spurring investment. The authors explain such relation by the fact that remittances help to release credit constraints in countries where credit markets are imperfect. When potential investors, who lack credit histories and collateral assets, do not have access to formal sector loans, they can benefit from the financial contribution of a friend or a relative living abroad, namely through remittances. On the contrary, when capital market imperfections are limited and access to credit is readily available, small entrepreneurs can rely on the financial sector, and remittances are not as useful as in shallow financial systems.

The substitutability hypothesis is supported by Calderón, Fajnzylber and López (2007), who find that the effect of remittances on growth is inversely related to financial depth in developing countries. For instance, according to their calculations, an increase in remittances by one standard deviation would lead to a higher growth rate of 0.46 percent per year in Argentina, 0.39 percent in Peru, and 0.31 percent in Brazil. Such result is consistent with the fact that financial development is higher in Brazil than in Peru and in Argentina, both in

terms of the ratio of liquid liabilities to GDP, and private credit by deposit banks and other financial institutions to GDP (Beck, Demirgüç-Kunt and Levine, 2000).

In a different perspective, but in line with the substitutability hypothesis, Aggarwal, Demirgüç-Kunt and Pería (2006) suggest that if recipients' marginal propensity to consume is high or if people distrust financial institutions and prefer informal ways to save their money, an increase in remittances might not necessarily be synonymous with a rise in the demand for credit. Furthermore, as far as remittance inflows contribute to relaxing recipients' financial constraint, there is a risk that the demand for credit decreases, thus, bridling financial development. Nevertheless, the few empirical studies related to the impact of remittances on financial development do not seem to confirm such hypothesis, but rather reveal a positive effect of migrants' transfers on the financial sector.

The complementarity hypothesis argues that there is a positive interaction between remittances and financial development. High levels of financial development help migrants to send more money home and, in turn, a significant inflow of remittances contributes to promoting "financial democracy", that is, a better access of the population to services offered by financial institutions (Terry and Wilson, 2005). Such interaction should, therefore, lead to a virtuous circle, where an increase in remittances brings

about a higher level of financial development that allows migrants to send more money.

Like Giuliano and Ruiz-Arranz (2005), but reaching an opposite conclusion, Mundaca (2005) examines how remittances have affected economic growth in Mexico, the Dominican Republic and six Central American countries over the period 1970-2003. She finds that the more developed the financial sector, the higher the impact of remittances on growth. The reason, according to the author, lies in the fact that efficient financial institutions help to channel remittances towards productive investment projects, particularly in the case of small and medium-sized businesses. In other words, when remittances enter the official financial sector, mainly private banks, the potential credit supply increases and this allows the financing of private initiatives at a lower cost. The effect of remittances on growth is even higher when used as collateral for loans from financial intermediaries.

In the same way, financial development has positive repercussions on the amount of remittances sent by migrants to their home country, at least through formal channels. As a matter of fact, most statistics on remittances tend to underestimate the real value of money transfers to developing countries, either because they do not take into account money transfer operators, or more generally because they exclude informal channels (de Luna Martínez, 2005). It is, therefore, logical to assume that countries with better financial development should receive –or at least measure– more (official) remittances. But beyond

the mere accounting aspect, broad and deep financial markets contribute to reducing transfer costs, and hence, tend to increase remittance flows, while a stable and reliable banking system leads migrants to prefer to send money through formal channels (Aggarwal, Demirgüç-Kunt and Pería, 2006). By contrast, inefficiencies in the financial sector, that is, delays in money transfers, high intermediation costs or unfavorable exchange rates tend to curb remittance inflows (Ratha, 2005). In this sense, policies that aim to promote financial democracy, that is, policies that facilitate the access to bank services (also called "bankarization"), that provide information about the remittance market, and that ensure greater transparency in the financial system, not only stimulate international money transfers, but also amplify the effects of remittances on development (Terry and Wilson, 2005; Orozco and Fedewa, 2006).

Finally, the complementarity hypothesis puts in evidence the role of remittances in strengthening financial markets in developing countries (Aggarwal, Demirgüç-Kunt and Pería, 2006; Pería, Mascaró and Moizeszowicz, 2007). First, migrants' transfers help recipients to benefit from financial services and products, like bank accounts and debit or credit cards, contributing to the consolidation of financial intermediaries. Second, if the average amount of remittances received by migrants' families is above their immediate needs, there might be an increase in the demand for savings deposits, even when remittances are sent through money transfers operators or informal channels. Third, the fact that migrants' families receive stable and

significant amounts of money facilitates their access to loans, making possible the expansion of the domestic credit market. Finally, high levels of remittances in developing countries have spurred the interest of financial intermediaries eager to capture the largest possible share of the market. As a result, competition between money transfer operators and banks has significantly increased, compelling them to invest in improving functional efficiency (Khoudour-Castéras, 2007).

As an extension to the previous work, and in order to confirm the relation between remittances and financial development, Pería, Mascaró and Moizeszowicz (2007) focus on the Latin American and Caribbean region. These authors carried out a macro-level analysis, based on 25 countries for the period 1975-2003, that reveals that the impact of remittances on financial development is positive but smaller than in other developing regions. In the authors' opinion, recurring crises in Latin America and the Caribbean have created a climate of distrust in the banking system, which explains why remittance recipients are less prone to use the financial system than in other regions. Nevertheless, micro-level evidence from 19 household surveys conducted in 11 Latin American and Caribbean countries shows that the probability of using financial services, namely bank accounts and credit, is higher among households that receive remittances than for the rest of the population. Lastly, country-specific studies in El Salvador and Mexico confirm that remittance recipients are better "bankarized" than other people, but do not find evidence that remittances affect credit levels.

Ambrosius (2006) argues that in some cases, remittances may neither substitute for nor complement financial development, but rather worsen the condition of the latter. In cases where remittances are spent exclusively on the import of consumption goods, foreign currency would not be available for the entrepreneurial sector, no multiplier effects would occur and there would be no positive impact on development in the financial sector. Another way by which remittances may be detrimental to financial development is the deposit pattern of remittances receivers. If most remittances receivers do not own bank account, especially when a high proportion of them reside in poor rural areas where knowledge about banking is very poor, remittances will be held as cash, and as a result reduce the likely positive effect they would have and also limit their indirect effect on investment elsewhere.

Finally, when remittances are held as foreign currency rather than domestic, it will appear as if domestic currency is dollarized. This type of informal dollarization can lead to complete loss of control over monetary policy, including the loss of the function as a lender of last resort. The central bank can only issue local currency and intervene as a lender-of- last resort for claim in local money. When a run on bank accounts held in dollars or euros occurs, it has no mechanism to provide banks with liquidity exceeding its foreign reserves.

## III. Stylized Facts About Remittances and Financial Development in Nigeria

Migration phenomenon in Nigeria has begun before independence, but the pattern in the 1960s appeared to be different from what it is today. In the 1960s, the essence of migration, particularly to the developed countries was practically on human development grounds, and not for the purpose of remitting back home. In that period, there was acute supply of manpower for development and people were sent to countries like the United Kingdom, United States and Canada to acquire necessary skills, which will be useful for the country's development. Meanwhile, almost 50 percent of those that migrated then actually returned, while the rest 50 percent decided to stay back. Recognizing vast economic advantage in the country of resident, those who stayed back continued to arrange for how their relatives and friends will come and join them (Adebusoye, 2006).

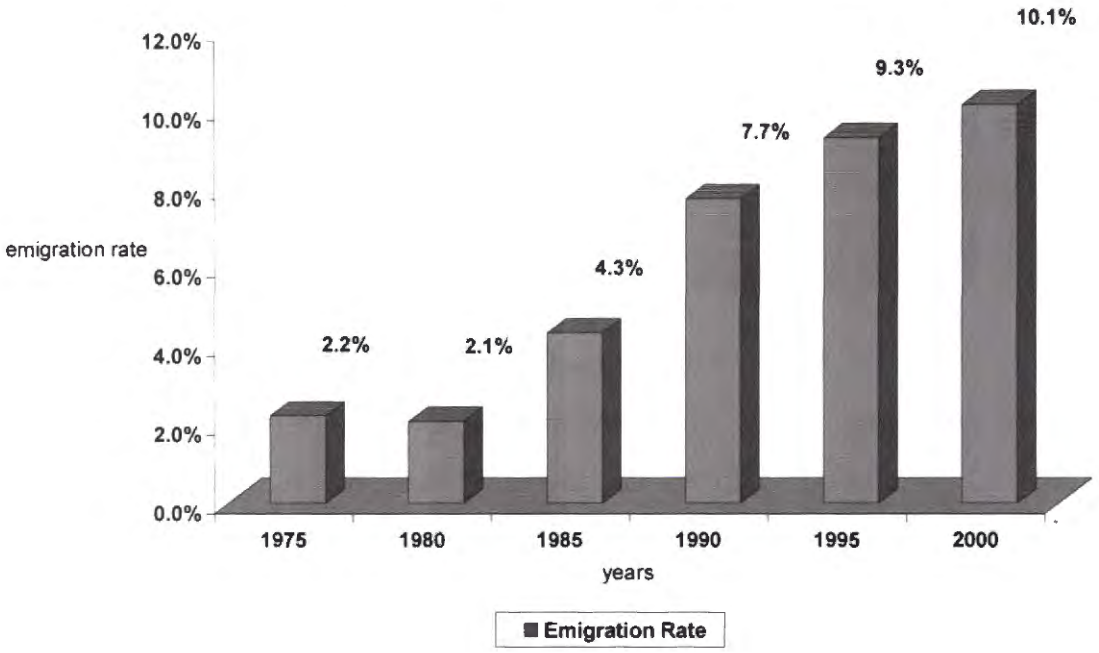
Nigerians officially residing in the OECD countries in 1990 were close to one million. Of this, about 50 percent reside in North America while the rest reside in Europe. Between 1990 and 2000, it was reported that the number of Nigerians migrating to the OECD increased by 6 percent on average (OECD, 2004). In the US, UK and Canada, the average growth rate of Nigerian foreign-based were computed to be around 56 percent, 57 percent and 100 percent respectively, in the period 1990-2006. In 2006 alone, the number of Nigerian workers who migrated to the UK was 117,000 of which 60,000 were women. In the US, 6,000 green cards were issued to Nigerians each year and,

of the 187 countries that applied for US visa in 2007, Nigeria had the highest number of applicants and winners[3]. What is striking in this migration process is the rate at which skilled workers migrate abroad. Specifically, the ratio of unskilled to skilled migrants in the OECD countries in 1990 was 1:8. This ratio increased to 1:11 in 2000 and by 2007, it was 1:13 (Docquier and Marfouk, 2005).

Figure 1 shows the rate at which educated Nigerians migrated abroad. From 1975 to 1980, the rate at which tertiary educated Nigerians migrated was computed to be around 2 percent, and increased to 4 percent in 1985. By 1995, the rate at which Nigeria's highly educated people migrated was put at around 9 percent, up from approximately 8 percent in 1990, and by 2000, the rate increased to 10 percent. What this implies is that not only in absolute term that Nigeria's emigrants is on increase, but also that Nigerian educated workers tend to migrate in an increasing number to developed countries annually.

[3] See www.stat.oecd.org/wbos/index.aspx?datasetcode=MIG

Figure 1: Emigration of Nigerian Tetiary Educated Workers (1975-2000)

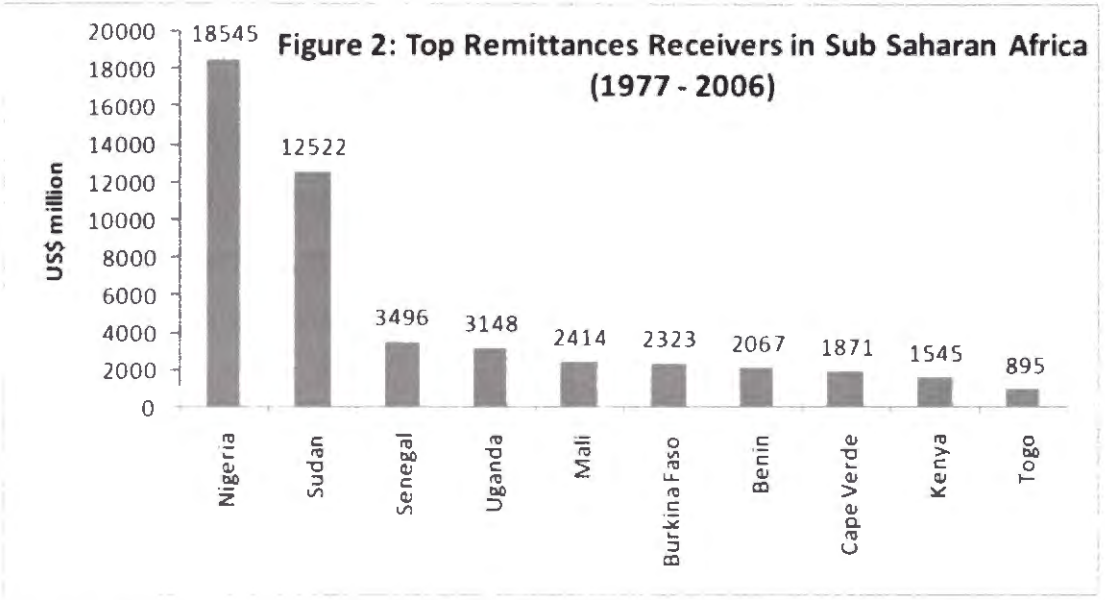



*Source: Author's Computation. Underlying data from Docquir and Marfouk (2005)*

The upward trend in migration rate in Nigeria is not unconnected with the fact that the domestic employment appears not to keep pace with labour force growth. For instance, the growth rate of unemployment is greater than the growth rate of labour force. Specifically, in 1981, when labour force grew at around 1.6 percent, the growth of unemployment rate was 3 percent. When labour force growth fell to 2 percent and 1 percent in 1985 and 1990 respectively, unemployment growth rate hovered around 3 percent in the same period. In 2005, when labour force grew by 3 percent, unemployment rate grew by 20 percent. With unemployment growing, while better employment

opportunities abound abroad, it is natural to expect workers to move to where their productivity can be well rewarded, and since most Nigerians migrate on altruistic basis (see Orozco, 2008), outflow of workers will lead to inflow of remittances. The money sent back home certainly contribute to the state of welfare of the migrant families left back at home allowing them to have access to credit to purchase goods and services and possibly to accumulate asset.

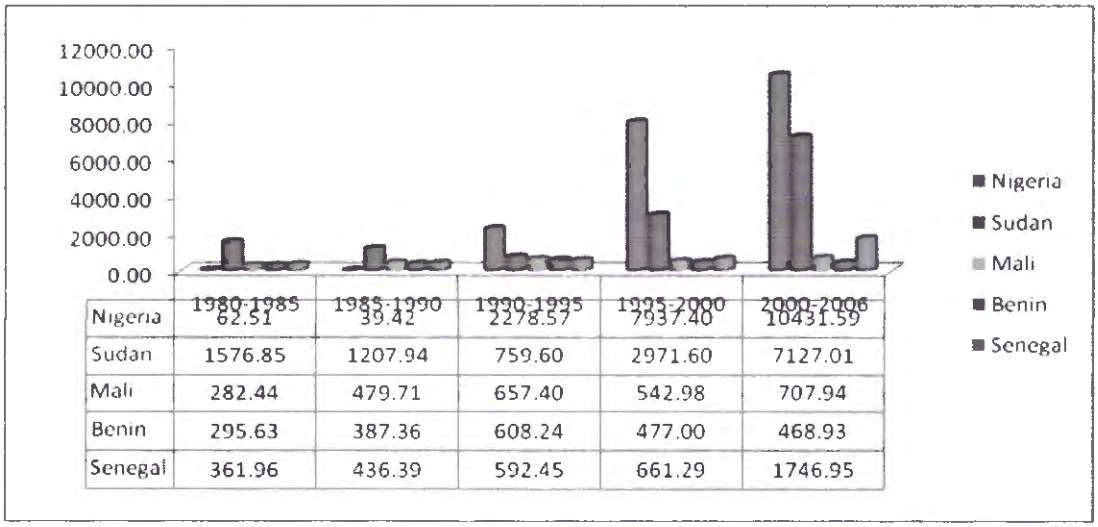
As shown in Figure 2, Nigeria is the largest recipient of workers' remittances in Sub-Saharan Africa (SSA). Specifically, between 1977 and 2006, total workers' remittances received by migrant families in Nigeria were US$18.5 billion. This amount constituted about 150 percent of workers' remittances sent to Sudan, the country that was the second largest remittances receivers in Sub-Saharan Africa. However, it appears the graph conceals information about the structure of remittances in SSA. Figure 3 shows periodic trend of remittances in SSA. As can be verified,




*Source: Computed. Underlying data from IMF Balance of Payments Yearbook (CD-ROM, 2008)*

Between 1980 and 1990, Nigeria was the third largest receiver of remittances behind Sudan and Mali. Clearly, Nigeria's remittances during this period were grossly underestimated. One reason for the underestimation was the absence of improved financial intermediation. From 1990 upwards, Nigeria has been leading while Sudan closely followed. The reason why Nigeria appeared to be the highest receiver of remittances is not only because most Nigerians migrate to countries like the US, UK Canada and Ireland, but also because most of them are highly skilled.

**Figure3: Top five remittances receivers in Sub-Saharan Africa**




| | 1980-1985 | 1985-1990 | 1990-1995 | 1995-2000 | 2000-2006 |
|---|---|---|---|---|---|
| Nigeria | 62.51 | 39.42 | 2278.57 | 7937.40 | 10431.59 |
| Sudan | 1576.85 | 1207.94 | 759.60 | 2971.60 | 7127.01 |
| Mali | 282.44 | 479.71 | 657.40 | 542.98 | 707.94 |
| Benin | 295.63 | 387.36 | 608.24 | 477.00 | 468.93 |
| Senegal | 361.96 | 436.39 | 592.45 | 661.29 | 1746.95 |

*Source: Author's computation. Underlying data from IMF Balance of Payments Yearbook (CD-ROM, 2008)*

However, it is not clear whether this important foreign exchange inflows substitute for, complements or even detrimental to financial development. Table 1 presents a snap-shot of the relationship between financial development and remittances. This table shows that the average growth rate of remittances in 1980-1984 period was -1.4%, implying that on average, remittances actually declined in that period. In the 1985-1989 period, remittances grew at an average of approximately 9% while that of foreign direct investment grew at around 20% and official development assistance grew at an average of 26%. In 1990-1995 period, remittances recorded an astonishing average growth rate of about 86% while FDI's average growth rate was around 8% and ODA experienced growth decay to the tune of 1% on average. In this period, demand deposit grew by 10%, slightly better when compared to the immediate

preceding period. Growth rates of all foreign capital inflows fell in the 1995-1999 period. Incidentally, the growth rate of financial development indicators, particularly demand deposit also fell. In the 2000s, while the growth rate of remittances fell, that of demand deposit, credit to the private sector and other foreign inflows actually rose. What this trend implies is that the relationship between remittances and financial development in Nigeria cannot be determined a priori. In the earlier decade, when the financial development of Nigeria was relatively crude, remittances tended to grow in the same direction as demand deposit, while in the later decades, when the financial development was relatively better and improving, remittances tended to move in the opposite direction. It is, therefore, important to explore further in order to establish the exact relationship between remittances and financial development, and also, to find out the magnitude and direction of effect of the former on the latter.

**Table 1: Growth Rates of Foreign Inflows and Financial Development in Nigeria**

| Period | Demand Deposit | Credit to the private sector | Remittances | FDI | ODA |
|---|---|---|---|---|---|
| 1980-1984 | -2.32 | .. | -1.43 | -0.19 | -0.20 |
| 1985-1989 | 9.86 | .. | 8.79 | 19.70 | 26.44 |
| 1990-1994 | 10.40 | 74.70 | 85.54 | 7.93 | -1.43 |
| 1995-1999 | 2.60 | -19.17 | 7.17 | 1.34 | -1.65 |
| 2000-2006 | 9.10 | 19.37 | 3.37 | 17.11 | 50.33 |

*Source: Author's computation. Underlying data from IMF Balance of Payments Yearbook (CD-ROM, 2008)*

## IV. Methodology and Data

To examine the effects of workers' remittances on financial development, we adopt a log-log specification model. The log-log functional form provides an improvement of the responsiveness of the dependent variable to a certain percentage change in any of the independent variable. We adopt this model because we are interested in how financial development responds to changes in foreign inflows, particularly remittances. Following Guiliano and Ruiz-Aranz (2005), and Aggarwal, Demirguc-Kunt and Peria (2006), we specify the relationship between financial development and remittances as follows:

$$FINDEV = \alpha_0 + \alpha_1 REM_t + \alpha_2 X + \mu_t \quad (1)$$

Where FINDEV is the financial development variable, REM is workers' remittances and X is a vector of other control variables that affect financial development. The term t refers to the time period from 1980 to 2006. This is because remittances are better accessed from 1980 upwards, and as at the time of writing this paper, data for 2007 was yet to be accessed. FINDEV in our study refers to the bank credit to the private sector or the bank deposits. These are the standard measures of financial depth used in the literature (see King and Levine, 1993; Aggarwal et al, 2006; Buch and Kuckulenz, 2004). We collected data for these variables from the International Financial Statistics (IFS CD-ROM, 2008).

REM is workers' remittances, and data for this variable were extracted from IMF Balance of Payments Yearbook, (CD-ROM 2008). It must be noted that workers' remittances is one component of remittances. Other components include compensation of employees (wages, salaries and other benefits earned by non-resident workers for work performed for resident's of other countries) and migrant transfers (financial items that arise from the migration or change of residence of individuals from one economy to another). Money repatriated back home by workers who work and reside in the foreign country more than one year is called workers' remittances. Thus, the reason for choosing workers' remittances is to understand how Nigerians who chose to work and stay in the foreign land, contribute to the financial development of their country of birth[4].

The matrix X refers to a set of variables that the literature has found to affect financial development. We use GDP to control for country size and GDP per capita to control for the level of economic development. These variables are included based on the fact that the development of the financial sector requires paying fixed costs that become less important the larger the size of the economy and the richer the country. Inflation is another control variable adopted in this model. Boyd, Levine and Smith (2001) pointed out that inflation tends to distort economic agent's decision-making regarding nominal magnitudes, discouraging financial intermediation, and promoting saving in

[4] Country of birth in this case refers to the home country where migrants were born before jetting out of the country

real assets Current and capital account openness have also been found to have positive effect on financial development (Chinn and Ito, 2002). There are various ways of developing current and capital accounts openness but in our model, we consider two indexes[5]. The first one is the ratio of capital inflows to GDP. These capital inflows include official development assistant (ODA) and foreign private direct investment (FDI). The second one is the share of merchandise export plus import in GDP, that is the degree of trade openness.

It is important to point out that endogeneity problem may be present if equation 1 is estimated using OLS. This is because policies and development of the financial sector in the previous period may affect its performance this period. Not only that, most of the independent variables can affect and be affected by policies, such that their previous values can affect the present value. In particular, most, if not all the variables may not be stationary. In order to detect the non-stationarity, we adopt the Augemented-Dickey Fuller unit root test. If all the variables are found to be stationary at their first difference, we proceed further to test for cointegration using the Johansen co-integration test. Two or more variables will be co-integrated if they have a long-term relationship between them. Thus, co-integration of two or more series suggests that there is a long run relationship. The systems approach developed by Johansen and Juselius (1990), Johansen (1991, 1995) can be applied to a set of variables containing possibly mixture of I(0), I(1) and I(2)

[5] Chinn and Ito (2002) develop an openness index using the first principal component of four variables capturing the absence of multiple exchange rate regimes, restrictions on current account transactions, restrictions on capital account transactions and requirements of the surrender of export proceeds.

(Perasan *et al*, 2001). Having detected the existence of cointegrating equations, then we proceed to modify equation 1 such that it becomes a structural dynamic model. The is the presence of long run relationship implies that the response of dependent variable to any nominal change in the independent variable may appear to be insignificant because the long-run information is lost. To restore this lost long run information, we will revert to a vector error correction model. The general form of the vector error correction model is given as follows:

$$\Sigma\Delta y_t = \alpha_0 + \alpha_1 t - \Pi z_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta z_{t-1} + \psi w_t + \mu_t \qquad (2)$$

where $z_i = (y_i, x_i,) \ldots y_i$ is an $m_{yX}$ 1 vector of endogenous I(1) variables

$x_i$ is an $m_{xX}$ 1 vector of exongenous I(1) variables

$\Delta x_t = \alpha_0 + \sum_{i=1}^{p-1} \Gamma'_i \Delta z_{t-1} + \psi w_t + \mu \ldots w_t$ is a q*1 vector of explanatory variables I(0)

In the model, the disturbance vector of $\mu$ and $w_i$ satisfy the assumptions:

(a) $\mu_t = (e_t w_t) iid(0, \Sigma)$ where $\Sigma$ = a symmetric positive-definite matrix (b) $\mu_i$ = (the disturbance term in the combined model) are distributed independently of $w_t$, i.e. $E(\mu_i/\Pi)$ = long run multiplier matrix i.e. $\Pi$ is multiplier matrix of order $(m_y + m)$. where m = (mx + my)

$\Gamma`_{ty} - \Gamma`_{p\text{-}t.y}$ = coefficient matrices capture the short run dynamic and are of order $m_y$*m and $\psi_y$ = the $m_y$*m matrix of coefficients on the I(0) exogenous variables.

In this model, we investigate the short-run as well as long run relationship between remittances and financial sector's performance by utilizing the autoregressive-distributed lag (ARDL) con-integration method introduced by Perasan, *et al*, (2001). One important difference between ARDL and other co-integration techniques such as Johansen's procedure is that ARDL do not require pre-testing for unit roots. The main advantage of this procedure is that it can be applied regardless of stationary properties of variables in the sample and allows for inferences on long run estimates, which is not possible under alternative co-integration techniques (Sezgin and Yildirim, 2002). Therefore, ARDL has the advantage of avoiding the classification of variable into I(0) or I(1) since there is no need for unit root pre-testing. According to Ouattara (2004) in the presence of I(2) variables the computed F-statistics provided by Pesaran et al (2001) are not valid because bounds test is based on the assumption that the variables are I(0) or I(1), therefore, the implementation of unit roots tests in the ARDL procedure might still be necessary in order to ensure that none of the variables is integrated of more than order 1.

Following Pesaran, *et al,* (2001), we constructed the vector auto-regression (VAR) of order p, denoted by VAR(p), using the following explanatory variables and financial development:

$$x_i = \eta + \sum_{t=1}^{p} \delta_i x_{t-1} + \mu_i$$

where $x_i$ is the vector of both $x_i$ and $y_i$ where $y_i$ is the dependent variable defined as the financial development and $z_i$ = (REM, PCI, INF, OPEN, FDI,

ODA, GDP) is vector matrix which represents the set of independent variables in the concerned model, namely credit to the private sector, demand deposit, broad money and loan to the private sector (all expressed as share in GDP); $\delta_i$ is a matrix of VAR parameters for lag i. Following Pesaran, et al, (2001), $y_i$ must be I(1) variables, but the regressors $z_i$ can be either I(1) and I(0). Therefore, our preferred estimable model is given by:

$$\Delta LFIN_t = \alpha_0 + \alpha_1 \sum_{i=1}^{n} \Delta LREM_t + \beta_2 \sum_{i=1}^{n} \Delta LGDP_t + \beta_3 \sum_{i=1}^{n} \Delta LPCI_t + \beta_4 \sum_{i=1}^{n} \Delta INF_t +;$$

$$+ \beta_5 \sum_{i=1}^{n} \Delta LOPEN_t + \beta_6 \sum_{i=1}^{n} \Delta FDI_t + \beta_7 \sum_{i=1}^{n} \Delta LODA_t + \beta_8 CE_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots 4$$

The definition of these variables and sources of data is presented in Table 2 that follows.

**Table 2: Definition of Variables and Sources of Data**

| Variables | Definition | Sources of data |
|---|---|---|
| FIN | Financial development variable. There are four of them: share of deposit in GDP, share of broad money ($M_2$) in GDP, share of loan portfolio in GDP, and share of credit to the private sector in GDP | International Financial Statistics (IFS CD-ROM, 2008) |
| REM | Workers' remittances | International Monetary Fund (IMF) Balance of payments yearbook (CD-ROM, 2008) |
| GDP | Gross Domestic Product at current basic price | CBN statistical Bulletin (2007) |
| PCI | Per Capita GDP, measured as GDP divided by population | Population figure was extracted from World Development Indicators (CD-ROM, 2008) |
| INF | Inflation | CBN Statistical bulletin (2007) |
| OPEN | Degree of openness. This is measured by the sum of export and import divided by GDP | CBN Statistical bulletin (2007) |
| FDI | Foreign private Direct Investment | International Financial Statistics (2008 CD-ROM) |
| ODA | Official Development Assistance | International Financial Statistics (2008 CD-ROM) |

## V. Data analysis and result

Table 3 presents the descriptive statistics of both the dependent and the independent variables. As can be verified in the table, the mean log of remittances is greater than that of ODA but lower than FDI. The mean value

of remittances is also higher than the mean of PCI and OPEN. The highest mean log among the financial development indicators was credit to the private sector (CREDIT) with 48.19 and this is closely followed by money supply (broad money), that is M2. The standard deviation of REM is lower than that of ODA and FDI, suggesting that remittances may likely be less volatile than either ODA or FDI.

**Table 3: Descriptive Statistics of the variables**

| | NGDP | REDIT | LOAN | M2 | DEPOSIT | REM | ODA | FDI | NFLATION | PCI | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 13.47 | 48.19 | 24.44 | 42.08 | 12.38 | 1.76 | 1.05 | 2.96 | 22.42 | 0.15 | 0.63 |
| Median | 13.46 | 41.27 | 20.63 | 34.24 | 10.51 | 1.82 | 0.53 | 2.60 | 16.95 | -0.02 | 0.65 |
| Maximum | 16.79 | 134.07 | 56.95 | 93.47 | 26.62 | 5.30 | 8.51 | 8.28 | 83.62 | 7.96 | 0.78 |
| Minimum | 10.83 | 10.26 | 9.47 | 16.43 | 5.31 | 0.01 | 0.05 | 0.67 | -5.55 | 15.55 | 0.48 |
| Std. Dev. | 2.01 | 33.82 | 12.28 | 21.09 | 5.84 | 1.84 | 1.92 | 1.97 | 20.74 | 4.96 | 0.09 |
| Skewness | 0.03 | 0.99 | 0.93 | 0.95 | 0.92 | 0.45 | 3.17 | 1.33 | 1.15 | -1.13 | -0.27 |
| Kurtosis | 1.54 | 3.01 | 3.07 | 2.93 | 2.95 | 1.81 | 11.80 | 4.37 | 4.01 | 5.07 | 2.17 |
| Jarque-Bera | 2.41 | 4.41 | 3.92 | 4.05 | 3.77 | 2.49 | 32.39 | 10.12 | 7.10 | 10.58 | 1.10 |
| Probability | 0.30 | 0.11 | 0.14 | 0.13 | 0.15 | 0.29 | 0.00 | 0.01 | 0.03 | 0.01 | 0.58 |
| Sum | 363.82 | 1301.17 | 659.99 | 136.13 | 334.24 | 47.59 | 28.48 | 79.85 | 605.21 | 3.95 | 17.01 |
| Sum Sq. Dev. | 105.22 | 9734.94 | 3922.26 | 565.62 | 885.73 | 88.43 | 95.47 | 100.87 | 11186.11 | 40.89 | 0.19 |
| Observations | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

Table 4 presents the correlation matrix of the variables. The Pearson Product Moment Correlation coefficients of the variables are significant at 5% level. As shown in the table, there is a strong and positive relationship between the financial development indicators and workers' remittances. However, the relationship is very weak ($r = 0.2$ for credit, $r = 0.03$ for M2, $r = 0.3$ for loans

and 0.1 for demand deposit). This gives a first sign that remittances may likely complement financial development. It is interesting to find out from the correlation matrix that inflation have a negative relationship with virtually all the financial development variables, even though the relationship appear very weak. This may suggest there is a weak and negative relationship between monetary policy and inflation. What is unclear is whether improvement in the financial development causes inflation or inflation reduces financial development. The correlation result also shows that remittances positively but weakly relate to all the financial development indicators. Among the remittances and financial development indicators, loans have the highest relationship. Other foreign inflows tend to record a negative and weak relationship. This suggests that inflow of remittances may likely improve financial deepening. Also, we find that remittances are positively related to the degree of openness more than other foreign inflows. For instance, where the correlation coefficient between remittances and openness is 0.15, that of FDI and ODA are 0.11 and -0.1, respectively. This implies that remittances may be important to trade more than FDI and ODA.

The result of the Augmented Dickey-Fuller unit root test is shown in Table 5. The result shows that all the variables are integrated of order one except per capita income which is integrated at levels and ODA that is integrated of order 2. Since none of the variables is integrated at a level higher than 2, our ARDL is appropriate.

**Table 4: Pairwise Correlation Matrix**

| | LNGDP | CREDIT | LOAN | M2 | DEPOSIT | REM | ODA | FDI | NFLATION | PCI | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LNGDP | 1 | | | | | | | | | | |
| CREDIT | -0.48 | 1 | | | | | | | | | |
| LOAN | -0.04 | 0.7699 | 1 | | | | | | | | |
| M2 | -0.34 | 0.9262 | 0.9022 | 1 | | | | | | | |
| DEPOSIT | -0.22 | 0.8711 | 0.936 | 0.9724 | 1 | | | | | | |
| REM | 0.843 | 0.203 | 0.2934 | 0.027 | 0.1 | 1 | | | | | |
| ODA | 0.508 | -0.337 | -0.095 | -0.344 | -0.18 | 0.44 | 1 | | | | |
| FDI | 0.337 | -0.028 | -0.034 | -0.075 | -0.13 | 0.36 | 0.06 | 1 | | | |
| INFLATION | 0.031 | -0.103 | -0.336 | -0.265 | -0.34 | -0.1 | -0.01 | 0.37 | 1 | | |
| PCI | 0.405 | -0.373 | -0.262 | -0.329 | -0.35 | 0.16 | 0.26 | 0.19 | 0.02 | 1 | |
| OPENNESS | -0.02 | 0.3392 | 0.2664 | 0.3714 | 0.394 | 0.15 | 0.11 | 0.11 | 0.04 | -0.12 | 1 |

**Table 5: Augmented Dickey-Fuller Unit Root Test***

| Variables | At level | First difference | Second difference | level of integration |
|---|---|---|---|---|
| CREDIT | -1.85 | -3.814 | .. | I(1) |
| LOAN | -2.47 | -4.827 | .. | I(1) |
| M2 | -2.26 | -4.844 | .. | I(1) |
| DEPOSIT | -2.43 | -4.798 | .. | I(1) |
| REM | -1.09 | -6.073 | .. | I(1) |
| ODA | 1.432 | -3.352 | .. | I(1) |
| FDI | -3.33 | -4.612 | .. | I(1) |
| PCI | -3.9 | .. | .. | I(0) |
| GDP | 0.81 | -4.03 | .. | I(1) |
| INFLATION | -3.73 | -6.239 | .. | I(1) |
| OPENNESS | -2.42 | -4.203 | .. | I(1) |

**the 5% critical value for the ADF statistics is approximately 3.45 for levels, first difference and second difference. The critical value is based on Mckinnon (1991)*

Following the information on the level of integration of the variables, we employ the Johansen approach for the investigation of long-run relationships among the variables. The Johansen procedure for multivariate cointegration test focuses exclusively on the effects of remittances and other variables on chosen financial development variables. In Table 6a, the Trace-test values

examine the null hypothesis of no co-integration against the alternative of co-integration. Starting with the null hypothesis of no co-integration (r=0) among the variables, the trace-statistics is 329, which is above 1% and 5% critical values 168.4 and 156, respectively. Hence it rejects null hypothesis $r \leq 0$ in favour of general alternative $r = 1$. As the evidence in the table, the null hypothesis of $r \leq 1$ can be rejected at 1% and 5% level of significance, hence its alternative of $r = 2$ is accepted. Consequently, we may conclude that there are four co-integrating vectors among credit to the private sector, remittances, macroeconomic variables and other financial inflows. This confirms the existence of long-run relationships among the variables in the basic specified model. The remaining Tables (tables 6b-6d) show similar result, and, therefore we can conveniently say that there exist long-run relationships among financial development indicators and macroeconomic variables.

To check the robustness in the long-run relationships among the variables, we turn to the ARDL approach. The first step is to select the lag length of the ARDL model, which is 3, on the basis of Akaike Information Criterion (AIC) and Schwarz Criterion (SC), estimated with Ordinary Least Square as shown in Table 7.

**Table 6a: Johansen First Information Co-integration Test Results, Credit to the Private Sector**

| Ho | Eigenvalue | Trace Statistic | 5 Percent Critical Value | 1 Percent Critical Value | Hypothesized No. of CE(s) |
|---|---|---|---|---|---|
| r=0 | 0.993 | 329 | 156 | 168.4 | None ** |
| r≤1 | 0.972 | 205 | 124.2 | 133.6 | At most 1 ** |
| r≤2 | 0.843 | 115 | 94.15 | 103.2 | At most 2 ** |
| r≤3 | 0.66 | 69.2 | 68.52 | 76.07 | At most 3 * |
| r≤4 | 0.527 | 42.2 | 47.21 | 54.46 | At most 4 |

**(**) denotes rejection of the hypothesis at the 5%(1%) level*

**Table 6b: Johansen First Information Co-integration Test Results, Demand Deposit**

| Ho | Eigenvalue | Trace Statistic | 5 Percent Critical Value | 1 Percent Critical Value | Hypothesized No. of CE(s) |
|---|---|---|---|---|---|
| r=0 | 0.99 | 334 | 156 | 168.36 | None ** |
| r≤1 | 0.97 | 202 | 124.24 | 133.57 | At most 1 ** |
| r≤2 | 0.84 | 116 | 94.15 | 103.18 | At most 2 ** |
| r≤3 | 0.7 | 70 | 68.52 | 76.07 | At most 3 * |
| r≤4 | 0.52 | 40 | 47.21 | 54.46 | At most 4 |

**(**) denotes rejection of the hypothesis at the 5%(1%) level*

**Table 6c: Johansen First Information Co-integration Test Results, Loan to the Private Sector**

| Ho | Eigenvalue | Trace Statistic | 5 Percent Critical Value | 1 Percent Critical Value | Hypothesized No. of CE(s) |
|---|---|---|---|---|---|
| r=0 | 0.9992 | 387.7 | 156 | 168.4 | None ** |
| r≤1 | 0.974411 | 209.4 | 124 | 133.6 | At most 1 ** |
| r≤2 | 0.840395 | 117.8 | 94.2 | 103.2 | At most 2 ** |
| r≤3 | 0.7282 | 71.9 | 8.5 | 76.07 | At most 3 * |
| r≤4 | 0.516245 | 39.33 | 47.2 | 54.46 | At most 4 |

*Note: *(**) denotes rejection of the hypothesis at the 5%(1%) level*

**Table 6d: Johansen First Information Co-integration Test Results, Money Supply (M2)**

| Ho | Eigenvalue | Trace Statistic | 5 Percent Critical Value | 1 Percent Critical Value | Hypothesized No. of CE(s) |
|---|---|---|---|---|---|
| r=0 | 1 | 334 | 156 | 168 | None ** |
| r≤1 | 1 | 198 | 124 | 134 | At most 1 ** |
| r≤2 | 0.8 | 115 | 94.2 | 103 | At most 2 ** |
| r≤3 | 0.7 | 71.1 | 68.5 | 76 | At most 3 * |
| r≤4 | 0.5 | 40.7 | 47.2 | 54 | At most 4 |

*note: *(**) denotes rejection of the hypothesis at the 5%(1%) level*

**Table 7: Lag length Selection (Credit to the Private Sector, Demand Deposit, Loan and Money Supply (M2)**

| Lag Order | Akaike Information | Schwarz Criterion | Log Likelohood | F-Statistics | Lag Order | Akaike Information | Schwarz Criterion | Log Likelohood | F-Statistics |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.115 | 8.24 | 0.054 | 11.64 | 1 | 5.1 | 8.23 | 0.1 | 2.06 |
| 2 | 4.474 | 8.33 | 23.07 | 9.08 | 2 | 4.3 | 8.13 | 26 | 2.01 |
| 3 | 3.995 | 8.58 | 44.07 | 4.021 | 3 | 4.1 | 8.66 | 43 | 6.05 |

| Lag Order | Akaike Information | Schwarz Criterion | Log Likelohood | F-Statistics | Lag Order | Akaike Information | Schwarz Criterion | Log Likelohood | F-Statistics |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.123 | 8.24 | 0.44 | 5.104 | 1 | 5.3 | 8.45 | 2.6 | 4.11 |
| 2 | 4.484 | 8.34 | 22.94 | 3.002 | 2 | 4.6 | 8.42 | 22 | 3.69 |
| 3 | 4.009 | 8.59 | 43.88 | 7.311 | 3 | 4 | 8.57 | 44 | 8.2 |

As the results in the table show, F-statistics exceeds the critical bounds, 4.29 is the lower bounds and 5.61 is the upper bounds. The result regarding co-integration is conclusive and there exists long-run relationship among the concerned variables in the identified models. These results provide a strong evidence of a long-run relationship among financial development, remittances, inflation, per capita income, trade openness, and other foreign financial inflows. Having found a long-run relationship, we applied the ARDL method to investigate the long-run and short-run elasticities. The results are presented

in Tables 8-11 below. Table 8 provides the parsimonious regression result of the effect of remittances on deposit

**Table 8: Structural Dynamic model of the relationship between demand deposit and remittances**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| Δ LNODA | 0.026 | 0.136 | 7.521*** | 0 |
| Δ LNREM | 0.103 | 0.102 | 1.014 | 0.322 |
| Δ $LNREM_{-1}$ | 0.111 | 0.1 | 1.102 | 0.283 |
| $ECDEP_{-1}$ | -0.227 | 0.133 | -1.706* | 0.103 |
| R-squared | 0.734 | Mean dependent var | | 0.247 |
| Adjusted R-squared | 0.697 | S.D. dependent var | | 0.713 |
| S.E. of regression | 0.393 | Akaike info criterion | | 1.115 |
| Sum squared resid | 3.242 | Schwarz criterion | | 1.31 |
| Log likelihood | -9.94 | Durbin-Watson stat | | 1.63 |

**** significant at 1%; ** significant at 5% and * significant at 10%*

There are only three variables that affect demand deposit. These are official development assistance, remittances and the lagged value of remittances. Official development assistance positively and significantly affects demand deposit, while remittance and its lagged value do not significantly affect demand deposit, even though the sign of the coefficients are positive.. Meanwhile, the fact that these variables cannot be removed from the model means that they show a signal to be a driver of demand deposit. The result shows that with a 10% increase in the inflow of official development assistance, demand deposit will rise by 0.2 per cent. If remittances rise by 10 per cent, the result shows that demand deposit shows a sign of rising by 1%. Also, an increase in the value of previous remittances tends to raise demand

deposit by 1.1 percentage point. The convergence variable, ECMDEP indicates that the speed of adjustment to long-run situation is approximately 22.7 per cent. The R-squared of the result shows that our model is able to explain about 73% of total variation in demand deposit. The Durbin-Watson falls above the upper band, an indication that there is no autocorrelation in the model.

Table 9 shows the response of credit to the private sector to changes in remittances. Degree of trade openness, official development assistance, per capita income and remittances are drivers of credit to the private sector in this model. Degree of trade openness and current and lagged values of remittances positively affect credit to the private sector while official development assistance and per capita income negatively affect credit to the private sector. In particular, a 10 per cent increase in trade activities will raise credit to the private sector by 2 per cent, while a 10 per cent increase in remittances will raise credit to the private sector by 1.4 per cent. If the official development assistance rises by 10 per cent, credit to the private sector will fall by 13 percent. In the same vein, a 10 per cent increase in per capita income will reduce credit to the private sector by 0.2 per cent. The lagged value of remittances shows that if remittance inflows rise by 10 per cent, credit to the private sector will necessarily rise by 1.4 per cent. Not only that, if the lagged remittances rise by 10 per cent, the present value of credit to the private sector will increase by 1.7 percent. The effect of lagged value of remittances on financial development indicates that previous remittance inflows are as

important as present inflows. Thus remittances are a strong and dynamic driver of credit to the private sector in Nigeria. Unlike the case of demand deposit, the rate of convergence to the long-run state is relatively fast (82%).

**Table 9: Structural Dynamic model of the relationship between credit to the private sector and remittances**

| Variable | Coefficient | Std. Error | -Statistic | Prob. |
|---|---|---|---|---|
| Δ OPEN | 0.21 | 0.506 | 4.104*** | 0.0008 |
| Δ LNODA | -0.13 | 0.07 | -1.88* | 0.0783 |
| Δ PCI | -0.02 | 0.01 | -1.71* | 0.107 |
| Δ $LNREM_{-2}$ | 0.17 | 0.064 | -2.67** | 0.0168 |
| Δ LNREM | 0.14 | 0.065 | 2.17** | 0.0454 |
| $ECREDIT_{-1}$ | -0.82 | 0.109 | -7.39*** | 0.000 |
| R-squared | 0.88 | Mean dependent var | | -0.02917 |
| Adjusted R-squared | 0.82 | S.D. dependent var | | 0.462695 |
| S.E. of regression | 0.19 | Akaike info criterion | | -0.17779 |
| Sum squared resid | 0.6 | Schwarz criterion | | 0.214894 |
| Log likelihood | 10.1 | Durbin-Watson stat | | 1.554251 |

**** significant at 1%; ** significant at 5% and * significant at 10%*

The value of the R-squared indicates that 88% of the total variations in the credit to the private sector are explained by our variables, thus, indicating that our model tend to reflect the true situation of the impact of remittances on financial development. In the same vein, the value of Durbin-Watson indicates that there is no sign of autocorrelation in the model.

Table I0 shows the situation in the case of bank loans. As the table shows, trade openness, remittances and inflation are drivers of loans to the private

sector. Meanwhile, trade openness, lagged value of remittances, and lagged value of inflation are not significant while current remittances and current inflation are significant. In particular, if remittances rise by 10 per cent, loans to the private sector will rise by 1.1 per cent. This implies that remittances have immediate impact on loans to the private sector. In the case of inflation, a 10 percent decline in inflation will raise loan to the private sector by 0.08 per cent. This suggests that inflation has a mild effect on loans to the private sector. The rate of convergence as indicated by ECLOAN(-1) appear to be high with 72. The proportion of the variation explained by our model in total variation is computed to be approximately 85% while Durbin-Watson statistics indicates absence of autocorrelation.

**Table 10: Structural Dynamic model of the relationship between Loan to the Private Sector and remittances**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| Δ OPENNESS | 0.072 | 0.51 | 0.142 | 0.889 |
| Δ LNREM | 0.116 | 0.058 | 1.995* | 0.063 |
| Δ $LNREM_{-1}$ | 0.083 | 0.054 | 1.546 | 0.142 |
| Δ INFLATION | -0.008 | 0.002 | -3.756*** | 0.002 |
| Δ $INFLATION_{-2}$ | 0.001 | 0.002 | 0.749 | 0.465 |
| $ECLOAN_{-1}$ | -0.727 | 0.093 | 7.802*** | 0 |

| | | | |
|---|---|---|---|
| R-squared | 0.846 | Mean dependent var | 0.026 |
| Adjusted R-squared | 0.779 | S.D. dependent var | 0.417 |
| S.E. of regression | 0.196 | Akaike info criterion | -0.16 |
| Sum squared resid | 0.615 | Schwarz criterion | 0.233 |
| Log likelihood | 9.921 | Durbin-Watson stat | 2.259 |

**** Significant at 1%; ** significant at 5% and * significant at 10%*

Table 11 shows how broad money responds to changes in remittance inflows. Inflation, trade openness, foreign direct investment, remittances and per capita income are variables that affect the behaviour of money supply. Out of these variables, only remittances have a positive impact on money supply, while the constant variable is not significant. A 10% increase in remittances will raise money supply by 1.8 per cent. If inflation rises by 10 per cent, money supply will fall by 0.1 percent. This implies that inflation have a mild impact on money supply. If trade openness rises by 10 per cent, money supply will fall by 6.2 per cent. In the case of foreign direct investment, money supply will fall by 1 per cent if the lagged value of FDI rises by 10 per cent. In the same vein, official development increase by 10 per cent will reduce money supply by 0.7 percent, while an increase in per capita income to the tune of 10 per cent will reduce money supply by 0.3. The speed of convergence as shown by the last variable is approximately 77 per cent. All the statistical properties of the model is in order with R-squared and adjusted R-squared being 92% and 87% respectively, while Durbin-Watson and F-statistics are 2.3 and 18.1

**Table 11: Structural Dynamic model of the relationship between Money Supply and remittances**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -0.04 | 0.036 | -1.07 | 0.3036 |
| ΔINFLATION | -0.01 | 0.002 | -6.99*** | 0 |
| Δ OPENNESS$_{-1}$ | -0.62 | 0.347 | -1.79* | 0.0929 |
| Δ LNFDI$_{-1}$ | -0.1 | 0.065 | -1.6* | 0.1309 |
| Δ LNODA | -0.07 | 0.065 | -1.06 | 0.3039 |
| Δ LNREM | 0.18 | 0.047 | 3.788*** | 0.0018 |
| Δ PCI | -0.03 | 0.008 | -4.09*** | 0.001 |
| ECM2$_{-1}$ | -0.77 | 0.108 | -9.94*** | 0 |
| R-squared | 0.92 | Mean dependent var | | -0.0128 |
| Adjusted R-squared | 0.87 | S.D. dependent var | | 0.421708 |
| S.E. of regression | 0.15 | Akaike info criterion | | -0.60408 |
| Sum squared resid | 0.36 | Schwarz criterion | | -0.11653 |
| Log likelihood | 17.6 | F-statistic | | 18.12136 |
| Durbin-Watson stat | 2.32 | Prob(F-statistic) | | 0.000002 |

**** Significant at 1%; ** significant at 5% and * significant at 10%*

## VI. Summary and Conclusion

The importance of workers' remittances in economic development has since the last two decades been receiving attention. One of the roles played by workers' remittances in development is in the area of financial development. The literature does not unanimously agree on the impact. Given the fact that financial institutions of a country is the lifeblood of economic activities due to their role in fostering growth and reducing poverty, it is, therefore, important to examine the behaviour of workers' remittances in financial development in Nigeria. Specifically, this study sought to answer this question: are workers'

remittances substitutes for, complements or worsen financial development in Nigeria?

We used demand deposit, credit to the private sector, bank loans and banking sector liquidity – M2 – as measures of financial development. We also controlled for other capital flows, trade flows, inflation, and country size among others. We adopted a dynamic structural equation after establishing a long-run relationship between remittances and financial development.

Taking data spanning 27 years from 1980, we found out that workers' remittances show a positive but insignificant effect on demand deposit. Demand deposit shows the extent to which deposit money banks can attract financial savings and also provide a liquid store of value. This implies that though remittances have potential to raise financial saving, the ability to take advantage of this by the deposit money banks is weak. As a result, a good proportion of remittances do not find its way into banks as deposit. This confirms one of the characteristics of remittance receivers - most of them are relatively poor and once remittances are withdrawn in foreign currency, it will be converted to domestic currency in the parallel market and a good percentage of such money will not find its way to the bank directly. Specifically, the saving culture of remittance receiver appears weak.

The effect of remittances on loans is positive but also insignificant. Loans by deposit money banks to the private sector measure the extent to which the

private sector relies on banks to finance businesses and also final consumption. This implies that remittances show a sign of complementing financial sector in making more money available for loans. The insignificance nature suggests that in spite of its potential, it contributes very little to the availability of loanable fund of banks.

In the case of credit to the private sector, which measures the extent to which commercial banks are able to play their role as a financial intermediary by making credit available to the private and public, we found that remittances positively and significantly affect this variable. Perhaps the reason why remittances significantly affect credit is that the latter is a short-term loans, and as a result, banks prefer to engage more of their liquidity in short-term loans rather than long-term loans and remittances play an important role in increasing the amount of credit available for the private sector. This implies that workers' remittances complement financial development through availability of credit to the private sector.

Finally, we found a strong evidence of a positive and significant effect of remittances on the liquid liabilities of the financial system, that is, the broad money. It must be recalled that broad money comprises monetary base, deposit money bank, money in other financial institutions like insurance, stock market and even thrift in the case of Nigeria. The positive effect suggests that remittances complement financial deepening of the country. the fact that it is not significant may suggest that most remittance receivers put the money in

demand deposit account.[6] It also suggests that a good proportion of remittances are deposited in other forms of financial institutions rather than deposit money banks. Overall, worker's remittances appear to be the type of financial inflow that complements financial development of the country.

## VII Policy Recommendation

The study shows positive effect on financial development, particularly broad money and loans. To make remittances effective, policy directive at making saving attractive in the country will unarguably raise the proportion of banked remittances. One way of doing this is to arrange a particular interest rate for remittance receivers, by promising them relatively high returns if they will convert their hard currency to domestic currency and deposit a large proportion of it in banks. Those who have not opened an account can be convinced to open and operate one. Another way of improving financial development through remittances is to allow more financial transfer agents as is done in Latin America. The existing financial transfer agents appear to be oligopolistic and, hence, reduce the efficiency gain, and increase dead weight loss by making cost of transfer relatively costly for the remitter while the intermediary reap all the benefit of transfer.

Another reason why deposit is not affected by remittances is because of the exchange rate premium. This premium is informed by the difference between

[6] It may be the case that remittance reciepients involve in other deposit scheme like thrift, purchase of shares or for buying insurance scheme

parallel market exchange rate and official (both the CBN/WDAS and Interbank) rates. Thus attempt at closing the gap or reducing the gap between official and unofficial exchange rates may raise 'bankerized remittances'. Furthermore, some deposit incentives and promotions can be embarked upon by the commercial banks. Such incentive can be enforced by the Central Bank of Nigeria.

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