Migrants Remittances and Financial Inclusion among Households in Nigeria

Joseph Boniface Ajefu[1] & Joseph O. Ogebe[2]

Abstract

This paper investigates the impact of remittances on financial inclusion, using the 2009 World Bank's Migration and Remittances Household Survey data for Nigeria. An instrumental variable estimation technique was used to estimate the impact of remittances on financial inclusion, and migrant network effect was used as an instrument to control for potential endogeneity between remittance and financial inclusion. The paper finds that the receipt of remittances increases the probability of using formal financial services, such as deposit accounts and internet/mobile banking. The paper concludes that reducing barriers and costs to remittance inflows can improve the access to and use of formal financial services in Nigeria, which can lead to an increase in funds for investments and the economic growth of the country.

Keywords: Migrants, remittances, financial inclusion, households, Nigeria

[1] Postdoctoral Research Fellow, School of Economic and Business Sciences, University of the Witwatersrand, South Africa. Email: joeajefu@gmail.com
[2] Department of Economics, Faculty of Social Sciences, University of Ibadan, Nigeria. Email: ogebejoseph2011@gmail.com

1.0 Introduction

In recent years, there has been an upsurge in the receipt of remittances by migrant households in developing countries[3]. Remittance inflows increased from US$432 billion in 2015 to US$516 billion in 2016. Migrant remittances account for the second largest inflow of resources after Foreign Direct Investments (FDI) to developing countries, with US$ 431 billion for remittances against US$ 662 billion for FDI in 2014 (World Bank, 2005, 2013, and 2014). Moreover, recent data reveal that remittance inflows to Nigeria rose from $16.93 billion in 2006 to $20.83 billion in 2014, making Nigeria the sixth largest recipient of remittances in the world[4] (World Bank, 2016).

The motivations to remit are often influenced by a combination of economic and social factors, such as self-interest, altruism, investment, loan repayment and bequest motives (Lucas and Stark, 1985; Rapoport and Docquier, 2006). Furthermore, a large body of literature has emerged on the effects of remittances on investment in microenterprises, asset accumulation, poverty, inequality, health, and education (Ajefu, 2018; Yang, 2008; Woodruff, 2007; Adams and Page, 2005; McKenzie and Rapoport, 2007; Amuedo-Dorantes et al., 2007; Acosta et al. 2007). However, studies that investigate the impact of remittances on financial inclusion in the Nigerian context are scarce. In this paper, we use the 2009 World Bank's Migration and Remittance survey for Nigeria to test the hypothesis that remittances have an effect on the use of formal financial services.

Both theoretical and empirical evidence show that migrants' remittances can affect financial inclusion through the following channels. First, remittances through formal channels might increase households' demand for deposit accounts. Due to the fixed costs associated with sending remittances, households' receipts from remittances are likely to be at irregular intervals, providing households with excess cash for a limited period of time. This could increase households' demands for deposit accounts for safekeeping of any temporary excess cash from the lumpiness of remittances (Anazoategui et al. 2014; Nyamongo and Misati, 2011; Aggarwal et al. 2011; Ambrosius and Cuecuecha, 2016). Second, receiving remittances through formal channels

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[3] Further evidence shows that in 2010, worldwide remittance flows are estimated to have exceeded US $440 billion, of which US $325 billion were transmitted to developing countries, an amount that far exceeded the volume of official aid flows and constituted more than 10 percent of gross domestic product (GDP) in many developing countries (World Bank, 2011).

[4] See the Appendix of this paper for the graph of annual remittances to Nigeria from 1970–2014.

may expose households to information about existing bank loan products. In addition, the confidence of financial institutions to lend to such households will be enhanced through access to vital information of the remittance-receiving households (Nyamongo et al. 2012; Chami and Fullenkamp, 2012). Third, the saving of remittances at financial institutions allows savings from remittances to be channeled to meet the demand for credit by households or firms (Orozco, 2004; Orozco and Fedewa, 2006; Terry and Wilson, 2005).

The aim of this paper is to explore the impact of remittances on financial inclusion. In particular, we explore whether remittances stimulate the use of financial products among Nigerian households and whether remittance-receiving households differ from non-remittance-receiving households in terms of their use of formal savings instruments and financial products. The findings have implications for whether increases in migrants' remittances will enhance the financial inclusion status of households in Nigeria.

To address the above questions, this study uses instrumental variables estimation and Propensity Score Matching analysis. We use migrant network effects as the instruments to control for the potential endogeneity of migrants' remittances in order to obtain unbiased and consistent estimates of the impact of remittances on financial inclusion. The use of an instrumental variable strategy hinges on the possibility of omitted factors and reverse causations, which can lead to the endogeneity of remittances received by households. Moreover, the propensity score matching method was adopted as a robustness check to validate the results obtained from our estimations.

Our results show that households' receipts of remittances increases the likelihood of using deposit bank accounts and the adoption of mobile/internet banking. This paper contributes to an emerging literature on the impact of remittances on financial sector and regional economic development, and is also closely related to a growing body of literature on the impact of remittances on financial inclusion (Anzoategui et al. 2014; Aggarwal et al. 2011; Ambrosius and Cuecuecha, 2016). Our study, however, differs from the existing literature in the following aspects. We investigate the impact of remittances on households' use of financial services in the context of Nigeria: as one of the largest recipients of remittances in the world, it provides a particularly compelling context to undertake empirical research on remittances and financial inclusion.In Nigeria, as in many developing countries, remittances are sent and received in cash, and many

remittance-receiving households belong to the low-income strata, which are otherwise likely to be excluded from formal financial services.

The relevance of this study is underscored in the literature on the benefits of financial inclusion. Empirical evidence shows that access to microcredit increases consumption, income, employment and mental health (Karlan and Zinman, 2010; Pitt and Khandker, 1998; Khandker, 2005). In addition, access to microcredit can lead to greater investment in business durables, increases the number of businesses started, and improves the profitability of existing businesses (Banerjee et al. 2010). Access to and use of saving products have been shown to increase savings (Aportela, 1999, and Ashraf et al. 2010a), female empowerment (Ashraf et al. 2010b), productive investment (Dupas and Robinson, 2013), and consumption (Dupas and Robinson, 2013, and Ashraf et al. 2010b). Finally, financial inclusion is positively correlated with financial development, which can lead to increase in private investment and economic growth (Deodat, 2011; Mundaca, 2009; Misati and Nyamongo, 2010, 2011).

The rest of the paper unfolds as follows. In section 2, the background to financial inclusion in Nigeria is discussed, section 3 discusses the relevant literature, while section 4 discusses the data source and empirical methodology. Section 5 reports the empirical results. Section 6 concludes the paper.

2.0   An Overview of the Nigerian Banking Sector and Depth of Financial Inclusion

2.1   *The Nigerian Banking Sector*

The Nigerian financial sector is one of the largest in Africa in terms of bank assets, market capitalization, and number of listed companies in the stock market. The financial sector in Nigeria is comprised of a formal sector (e.g. deposit money banks) coexisting with an informal sector (informal savings scheme such as Esusu, Ajo and Adashe). The formal system provides services to the established formal institutions, informal businesses, and individuals, while the informal system attends to the needs of the less-organized, less-recognized micro-agents and institutions. These informal institutions generate micro-deposits, keep few records, and conduct cash-dominated transactions anchored on personal recognition with higher interest rates (Agu, 2011).

The historical development of banking institutions in Nigeria dates back to 1894 when the African Banking Corporation opened a branch (CBN 2013). Later the same year, the British Bank for West Africa (now First Bank of Nigeria PLC) absorbed that branch. In the 1930s and 1940s,

Nigeria witnessed indigenous banking boom that led to a surge of indigenous entrepreneurs becoming bank owners and the emergence of Nigerian owned banks (CBN 2013).

Nigeria witnessed an unprecedented growth in the number of banking institutions in the period between 1986 and 1994 due to the liberalization policy that was an offshoot of the Structural Adjustment Program (SAP). Many deposit institutions such as The Peoples Bank, Community Bank, and other primary mortgage institutions were established to expand depository outlets for small savers (CBN 2013).[5] This period recorded one of the highest number of banks and other financial institutions in the history of Nigeria. Over the most recent three decades, the Nigerian banking sector has undergone further changes through restructuring and liberalization of the financial sector; a notable modification came from the 2004 banking sector reforms, which raised the minimum capital base to N25 billion in order to promote the soundness, stability and efficiency of the Nigerian banking system and to enhance its international competitiveness (CBN 2013).

In recent years, various policies were enacted in order to strengthen the microfinance and other deposit mobilization and funds transfer institutions in Nigeria. However, the bulk of financial transactions –including the sending and receiving of migrant remittances in the country – are carried out through deposit money banks in the formal sector. The electronic card payment system has grown significantly in recent years, but as with other aspects of the financial sector, competition in the provision of electronic card payments is still weak (Agu, 2011).

Many Nigerian banks are involved in the remittance service industry but only as agents of the global money transfer organizations (MTOs). The most common MTOs are Western Union, MoneyGram, Travelex, Vigo, and Cash4Africa. Among these, Western Union and MoneyGram dominate transactions in the industry (Agu, 2011). Therefore, commercial banks are the main entities allowed to carry out remittance transfer in Nigeria (see Table 1).

Table 1: Commercial Banks, Money Transfer Organizations (MTOs) and Remittance Transfers

MTO	Banks in Nigeria	No. of monthly Transactions	Annual remittance revenue (US$)
MoneyGram	Bank PHB (Platinum Habib Bank Ltd)/1	40,000	4,200,000

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[5] During this period, commercial banks were required to establish branches in rural areas. However, most of these efforts yielded little in terms of establishing banks nearer to the rural areas or improving the informal sector's access to banking services (Agu, 2011).

	Equitorial Trust Bank		
	Spring Bank Nigeria Ltd		
	Union Bank of Nigeria Plc		
	United Bank for Africa (UBA)	25,000	2,625,000
Coinstar	Afribank Nigeria Plc	5,000	525,000
Western Union	Access Bank Ltd	5,000	525,000
	Diamond Bank Plc	8,000	840,000
	EcoBank	8,000	840,000
	Fidelity bank Plc	10,000	1,050,000
	First Bank Nigeria Plc	135,000	14,175,000
	Oceanic Bank Int'l Nigeria Ltd	32,000	336,000
	Zenith Bank Plc	5,000	525,000
	First City Monument Bank Plc/1	70,000	7,350,00
	Guaranty Trust Bank Plc		
	IBTC-Chartered Bank Plc		
	Intercontinental Bank		
	Skye Bank Nigeria Ltd		
	Sterling Bank Nigeria Ltd		
	Unity Bank Nigeria Ltd		
	Wema Bank		
	Total	343,000	36,015,000

Note: (i) some of the banks included in Table 1 are no longer in existence (ii) the data shows banks, MTOs and number of transactions as of 2008.
Source: US Agency for International Development (2007).

2.2   The Depth of Financial Inclusion in Nigeria

Among the factors militating against Nigeria's development, the lack of access to financial services is crucial. The deposit money banks that are integral components of the financial sector in Nigeria are yet to be fully developed (Central Bank of Nigeria , 2012). Deposit money bank services such as payment platforms and mobile payments, savings and credit are not available to much of the adult population. On the indicators of savings per 1000 people and credit penetration, Nigeria lagged behind South Africa and Kenya. In 2010, 39.2 million people representing 46.3 percent of the adult population were excluded from formal financial services (Central Bank of Nigeria, 2012). Table 2 shows details on deposit money banks and the extent of their reach.

In order to increase the access to financial services by both micro-entrepreneurs and low-income households, the Central Bank of Nigeria in 2012 introduced the National Financial Inclusion Strategy (NFIS). The objective of the NFIS is to reduce the percentage of Nigerian adults that are financially excluded from 46 percent in 2010 to 20 percent by the year 2020. The creation of the NFIS was motivated by the Central Bank's commitment to the 'Maya Declaration', adopted in Riviera Maya, Mexico, in 2011, with the objective of ensuring greater financial inclusion for

the unbanked population across the world (Central Bank of Nigeria, 2015). Specific targets for services through the framework of the NFIS include: payments, savings, credits, insurance, pension, as well as channels of service delivery such as physical branches and mobile money.

Table 2: Deposit Money Banks and Extent of Outreach 2010

	Extent of reach		
Products	Nigeria	South Africa	Kenya
Payments	36%	59%	52%
Mobile payments	0	46%	46%
Savings per 1000 people	461	638	381
Credit penetration	2%	30%	7%

Source: CBN (2012)

The NFIS had some immediate success. Reports from the National Financial Inclusion Strategy (2015) show that the number of adult transaction accounts increased by 5.3 million or 7.8 percent, while the number of savings-related accounts increased by 5.6 million or 7.8 percent for the period between 2014 and 2015. The number of credit accounts increased from 6.9 million in 2014 to 7.2 million in 2015, representing a growth of 5.6 per cent. The number of adult Nigerians registered with a regulated pension scheme increased by approximately 770,000 from 6.6 million in 2014 to 7.3 million in 2015 (Central Bank of Nigeria, 2015).

Despite the recent improvements in financial access by Nigerians, EFInA (2014) shows that only 48.6% (45.4 million) of the 93.5 million Nigerian adults have access to formal financial institutions. Among them, only 36.3% (33.9 million) have and/or use bank accounts, while 61% (57.1 million) have never had a bank account. Others (61%) are excluded from access to and use of financial services. It's common in many developing countries to have people without bank accounts and have no access to other financial services. One reason for the low financial inclusion is that Nigeria has a large rural population, which is relatively poor and depends on subsistence agriculture and informal finance (EFInA, 2014). Recent evidence from the Global Findex shows that factors such as the cost of opening a bank account, distance from the bank, lack of documentation, lack of trust, and religious reasons, are some of the constraints limiting financial inclusion of most Nigerians (Global Findex, 2014).

Furthermore, one component of financial inclusion, namely credit to the private sector, increased from 2007-2016, but still remains low in Nigeria compared to Kenya and South Africa (see Figure 1)
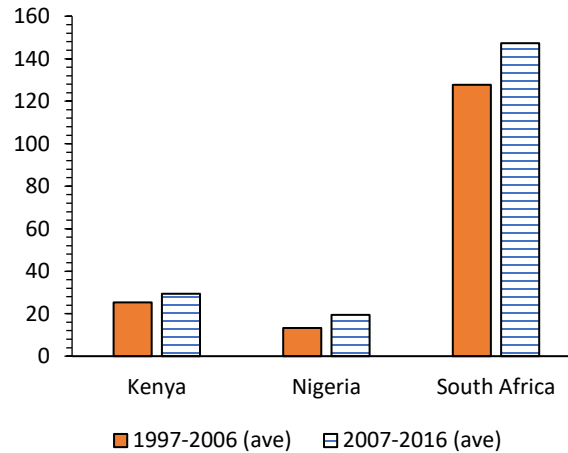

Figure 1: Credit to the private sector (% of GDP)
Source: World Development Indicators (WDI)

3.0   Literature Review

A number of papers have examined the effect of remittances on a range of household outcomes, such as poverty and inequality (Adams and Page, 2005; Acosta et al. 2008), entrepreneurship (Cox-Edwards and Ureta, 2003; Adams and Cuecuecha, 2010; Massey and Parrado, 1998; Woodruff and Zenteno, 2007), as well as education and health (Yang, 2008). Moreover, evidence from Nigeria and Guatemala finds that remittances lead to housing investments by the recipient households (Osili, 2004; Adams and Cuecuecha, 2010). These have positive effects on productivity, employment and, ultimately, on local economic development. However, Chami et al., (2003) argue that remittances could disincentivize labour supply through a decline in recipients' motivation to work, thereby creating a cycle of financial dependency. In addition, evidence shows that remittance recipient households may spend more on conspicuous consumption than investment in physical assets (Ahlburg, 1991; Brown et al. 1999; Chami et al. 2003).

In recent years, studies on remittance and financial inclusion have received attention among researchers and development policy experts alike. The growing interest in financial inclusion among researchers is linked to the importance of financial inclusion on household outcomes and

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financial development (for example see, Aportela, 1999, Ashraf et al., 2014; Ashraf et al., 2010; Dupas and Robinson, 2009). In this context, a growing body of literature investigates the impact of remittances on households' access and use of financial services (Anazoategui et al. 2014; Nyamongo and Misati, 2011; Aggarwal et al. 2010; Ambrosius and Cuecuecha, 2016).

Existing evidence provides two views on the relationship between remittances and financial inclusion. First, remittances can easily serve as a substitute for credit. This stems from a theoretical framework of imperfect credit markets where remittances help poor and liquidity-constrained households to invest in human or physical capital, and mitigate the impact of shocks through financing of emergencies (Calero et al. 2009; Taylor and Wyatt, 1996; Woodruff and Zenteno, 2007; Ambrosius and Cuecuecha, 2013). Second, a growing evidence supports a positive effect of remittances on savings, both at the country and household levels (Aggarwal et al., 2011; Gupta et al., 2009; Demirguc-Kunt et al., 2011; Anzoategui et al., 2014). Some of the reasons for the positive impact of remittances on savings indicators include the lumpiness of remittances, which may create a demand for deposit accounts; the transmission of knowledge of financial products; a reduction in information asymmetries from potential clients; and the evaluation of creditworthiness of clients through the receipt of remittances (Ambrosius and Cuecuecha, 2016; Orozco and Fedewa, 2006).

From the foregoing, we observe that there is an exiguity of literature on African countries on remittances and household outcomes in relation to financial inclusion. This study contributes to the existing literature and provides findings to inform policy debates and discussions.

4.0 Data Source and Empirical Methodology

4.1 Data Source

This study uses data from the 2009 World Bank's Migration and Remittances Household Survey of the Africa Migration Project for Nigeria. The survey is nationally representative and uses a stratified random sampling approach that includes 18 out of the 36 states and the Federal Capital in Nigeria, and interviewed 2,251 households. The survey was a single-round, and provides information on migration and remittances status of households. Information on the households' use of formal financial services includes whether: (i) household owns deposit account, (ii) household uses ATM/debit cards for financial transactions, and (iii) household uses

mobile/internet banking. Our focus in this study is to analyze the impact of households' receipts of remittances on access to formal financial services.

4.2   Empirical Methodology

The study analyses the relationship between household receipts of remittances and the use of formal financial services by estimating the following model below:

$$FI_h = \alpha + \beta_1 Remit_h + \beta_2 X_h + \varepsilon_h \tag{1}$$

where h is the household, FI is a binary variable that equals to 1 if the household uses measures of financial inclusion, and 0 otherwise (access to and use of formal financial services). $Remit$ is a continuous variable that denotes the amount of remittances received by the household, X represents households covariates or control variables, and ε is the error term. Following Anzoátegui et al (2014), for the control variables, we use average years of adult education, number of adults in the household, average age of adults, share of dependents in the household, share of female adults in the household, destination of migrant, migrant activity, sex of household head, regional dummy as well as location dummy. We estimated Equation (1) using a linear probability model (LPM). We also report marginal effects from probit regressions for the different financial inclusion indicators.

4.2.1   Instrumental variable approach

A major concern that could arise from the use of Linear Probability Model and Probit Model is that the estimates are likely to be endogenous due to omitted variables or reverse causation. Our estimates could be biased if there are omitted variables that are correlated with household's receipts of remittances and the probability of having access to and use of financial services. We address this concern by using an instrumental variable estimation. Reverse causation could affect our estimates from equation (1) because access to financial services might increase the ease of sending and receiving remittances, and therefore, this might increase the likelihood of migrants sending remittances.

To mitigate the potential bias that emanates from the possible endogeneity of our results, we adopt an instrumental variable estimation, using the share of households that receive remittances and the average amount of remittances received by households in the local government area, both at the local government area as instruments for whether a household receives

remittances. These instruments are known as migrant network effects and have been used in the migration and development literature (Acosta, 2010; Anazoategui et al., 2013; and Ajefu, 2018).

The motivation for the use of migrant network effects as instruments is that an individual's location or network can affect the likelihood of migration, and thus, the receipt of remittances by their household. However, it is unlikely that the migrant network effects (share of households that receive remittances and the average amount of remittances received by households in each municipal) will affect the household's access to and use of financial services.

The identification strategy used in this paper relies on the instruments (migrants network effects) satisfying both the assumptions of relevance and validity. First, migrants' remittances are positively correlated with the instruments used in our instrumental variable analysis. See table 1A in the appendix for the first stage results from the instrumental variable (IV) estimation. Second, we assume the absence of unobserved factors that are correlated with our instruments and invariably affect household financial inclusion Moreover, we assume that the instrument fulfil the exclusion restriction. This implies that the instrument does not affect the directly affect outcome, financial inclusion, except through through the first-stage regression.

5.0   Results

Most migrants moved from rural areas to urban areas. As depicted in Figure 2, about 67% of migrants moved within Nigeria (largely from rural to urban cities), 23% moved to high-income countries, 4% migrated to both middle and low-income countries, while 2% migrated to other countries. Of the total internal migrants, 31% are engaged in paid employment, 27% are self-employed, 27% are students, while the rest are unemployed, not in the labour force, or engaged in other activities. Most of the migrants in high-income countries are engaged in paid employment (73%). Most migrants in middle-income countries are self-employed (39%), students (34%), or engaged in paid employment (22%). Unlike migrants in high and middle-income countries, more than half of migrants in low income and other countries are self-employed.
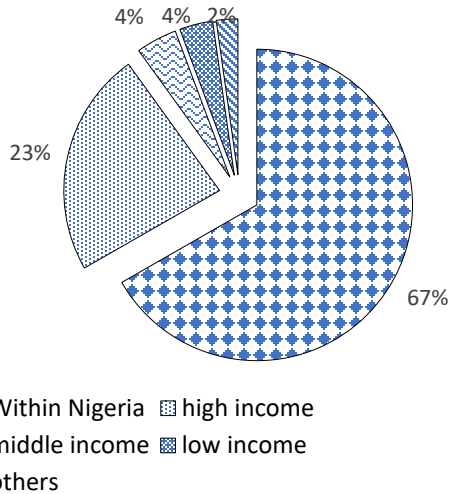
Figure 2: Destination of Migrants
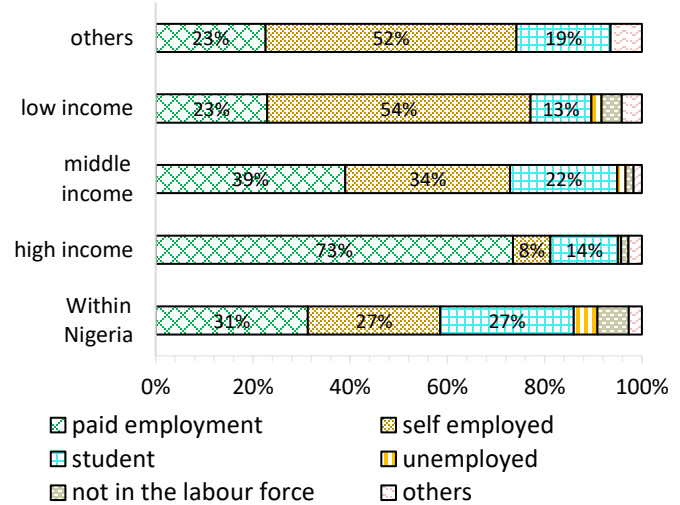*Source: Authors' Computation*

Figure 3: Activities and Destination of Migrants
Source: Authors' Computation

Panel 1 of Table 3 presents the summary statistics of major households' characteristics. The average annual remittance received per household was N299.1 thousand, of which internal remittances accounted for 57.6% and international remittance accounted for 42.2%. Thus, the bulk of total remittances are from internal migrants. Seventy-two percent of households have a bank account and 29% use mobile/internet banking. In addition, 70%) use ATMs/debit cards for financial transactions.

About the same proportion of households live in urban and rural areas. On average adults have 10 years of education. ' education in a household is about 10; the number of adult members in a household is about 4; the average age of adults in each household is 39 years; and the share of dependents in each household is 32.8%. Female-headed households accounted for 14.9 percent of total households, while the ratio of female adults in a household is 33.7%.

Table 3: Summary Statistics

	Panel 1: Descriptive Statistics					Panel 2: Test of Mean Difference (t-test)		
Variable	Mean	Std. Dev.	Min	Max	N	No Remittance (A)	Received Remittance (B)	Difference (A-B)
Internal Remittance (N'000)	172.350	798.645	0	21,600	1,427			
International Remittance (N'000)	126.780	759.102	0	21,600	1,427			
Total Remittance (N'000)	299.130	1,530.691	0	43,200	1,427			

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						0.688	0.747	
HH own deposit bank account	0.721	0.449	0	1	1,422	(0.463)	(.434)	-0.058**
HH uses mobile/internet banking	0.287	0.453	0	1	1,011	0.323 (0.468)	0.259 (0.438)	0.063**
HH use ATMs/debit cards	0.701	0.458	0	1	1,018	0.739 (0.439)	0.672 (0.469)	0.066**
Adults average education (years)	9.832	4.453	0	21.6	1,427	10.002 (4.460)	9.692 (4.444)	0.310
Number of adult members	3.578	2.102	0	16.0	1,427	3.302 (1.973)	3.803 (2.175)	-0.501***
Average age of adults (years)	39.131	9.902	18	89.5	1,423	37.491 (9.495)	40.471 (10.031)	-2.980***
Share of dependents (%)	32.813	24.960	0	88.9	1,427	35.411 (24.916)	30.687 (24.808)	4.724***
Share of female adults (%)	33.738	17.525	6.7	100.0	1,374	32.265 (16.488)	34.916 (18.239)	-2.650**
Location (Urban)	0.485	0.500	0	1.0	1,427	0.436 (0.496)	0.581 (0.493)	-0.128***
Sex of migrant (Female)	0.149	0.356	0	1.0	1,423	0.096 (0.296)	0.524 (0.499)	-0.088***

*Note: (i) *, ** and *** indicate significance at 10%, 5% and 1% respectively (ii) Standard deviations in parenthesis*

Source: Authors' Computation

Furthermore, the characteristics of households that received remittances[6] and those that did not receive remittances are presented in Panel 2 of Table 3. In this study, we proxied financial inclusion with three indicators: (i) household own bank account, (ii) households use mobile/internet banking for financial transactions and (iii) household use ATMs/debit cards for financial transactions. The result shows that most households that received remittances have a bank account and households with bank accounts received significantly higher remittances relative to those with no bank account. In addition, about 25.9 percent of households that received remittances used mobile/internet banking for financial transactions, while about 67.2 percent of households that received remittances used ATM/debit cards for financial transactions. Also, most female-headed households received remittances and most households that received remittances, reside in rural areas.

Table 4 presents the relationship between financial inclusion and total remittances, while the disaggregated (internal and international remittances) analyses are presented in Table 5. Both Table 4 and 5 use the Linear Probability regression estimation technique. Column 1 in each table

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[6] It should be noted that remittances consist of both internal migrant remittances and international migrant remittances

shows the impact of migrant remittances on the likelihood that a household member will own a bank account, while Columns 2 and 3 show the impact of migrant remittance on the likelihood that a household member will use ATMs/debit cards for financial transactions and mobile/internet banking for financial transactions. (Probit estimates are presented in Appendix Table 1 and are similar in direction and impact)

Although remittances have a positive effect on all financial inclusion indicators, their coefficient is only statistically significant for whether a household member has bank account. This holds whether we consider total remittances (Table 4) or separate internal and international remittances (Table 5). This suggests that remittances promote financial inclusion by increasing the chances of households owning a bank account. A unit change in migrant remittances increases the likelihood that a household member owns a bank account. This result is plausible given that owning a bank account lowers the cost of receiving remittances, thus increasing migrant remittance inflows.

Table 4: Impact of Remittances on Financial Inclusion (Probit regression method)

	Total Remittance		
	own a bank account (fibankacc)	use ATMs/debit cards (fiuseatm)	mobile/internet banking (fiusemobile)
Log of remittance	0.008***(0.002)	0.004(0.003)	0.003(0.003)
Age of adult	0.043***(0.003)	0.026***(0.005)	0.017***(0.004)
Number of adult in HH	0.019***(0.006)	0.007(0.009)	0.005(0.008)
Adults education	0(0.001)	-0.007***(0.002)	-0.005***(0.002)
% of HH < 18 yrs	0(0.001)	-0.001(0.001)	-0.002**(0.001)
% of female adults in HH	0(0.001)	0(0.001)	-0.001(0.001)
Destination of Migrants			
High income	0.014(0.024)	0.008(0.033)	0.070**(0.031)
Middle income	0.008(0.043)	0.121**(0.051)	0.071(0.059)
Low income	-0.012(0.051)	-0.091(0.079)	-0.036(0.079)
Others	0.055(0.072)	0.052(0.101)	0.007(0.084)
Activity of Migrant			
Self employed	-0.055*(0.029)	-0.012(0.041)	-0.046(0.038)
Student	0.003(0.028)	0.007(0.039)	-0.04(0.037)
Unemployed	-0.03(0.061)	0.131(0.094)	-0.035(0.089)
Not in the labour force	0(0.05)	-0.062(0.085)	0.01(0.065)
Others	-0.032(0.065)	0.024(0.1)	-0.009(0.088)
Sex (Female)	-0.083**(0.032)	-0.057(0.045)	-0.069*(0.04)
Constant	0.039(0.092)	0.588***(0.146)	0.515***(0.14)
Rural dummy	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes
Observations	1326	954	948
R-squared	0.403	0.167	0.294

*Note: (i) the probit regression reports the marginal effect (ii) *,** and *** indicate significance at 10%, 5% and 1%*
respectively . (iii) fibankacc is a dummy variable which takes 1 if a household member own a bank account;
fiuseatm is a dummy variable which takes 1 if a household member use ATMs/debit cards for financial transactions
and fiusemobileis a dummy which assumes 1 if a household memebr use mobile/internet banking for financial
transactions

Table 5: Impact of Remittances on Financial Inclusion (Probit regression method)

	Internal Remittance			International Remittance		
	own a bank account (Fibankacc)	use ATMs/debit cards (fiuseatm)	mobile/internet banking (fiusemobile)	own a bank account (fibankacc)	use ATMs/debit cards (fiuseatm)	mobile/internet banking (fiusemobile)
Log of remittance	0.008***(0.002)	0.004(0.003)	0.003(0.003)	0.006***(0.002)	0.002(0.003)	0.001(0.003)
Age of adult	0.043***(0.003)	0.026***(0.005)	0.017***(0.004)	0.043***(0.003)	0.025***(0.005)	0.017***(0.004)
Number of adult in HH	0.019***(0.006)	0.007(0.009)	0.005(0.008)	0.020***(0.006)	0.008(0.009)	0.005(0.008)
Adults education	0.000(0.001)	-0.007***(0.002)	-0.005***(0.002)	0.000(0.001)	-0.006***(0.002)	-0.005***(0.002)
% of HH < 18 yrs	0.000(0.001)	-0.001(0.001)	-0.002**(0.001)	0.000(0.001)	-0.001*(0.001)	-0.002**(0.001)
% of female adults in HH	0.000(0.001)	0.000(0.001)	-0.001(0.001)	0.000(0.001)	0.000(0.001)	-0.001(0.001)
Destination of Migrants						
High income	0.016(0.024)	0.009(0.033)	0.071**(0.031)	-0.007(0.028)	0.005(0.037)	0.067*(0.035)
Middle income	0.01(0.043)	0.122**(0.051)	0.072(0.059)	-0.011(0.045)	0.118**(0.053)	0.068(0.061)
Low income	-0.011(0.051)	-0.09(0.079)	-0.036(0.079)	-0.035(0.052)	-0.097(0.079)	-0.041(0.08)
Others	0.057(0.072)	0.053(0.101)	0.008(0.084)	0.03(0.073)	0.044(0.103)	0.001(0.085)
Activity of Migrant						
Self employed	-0.055*(0.029)	-0.012(0.041)	-0.046(0.038)	-0.063**(0.029)	-0.018(0.040)	-0.050(0.038)
Student	0.003(0.028)	0.008(0.039)	-0.039(0.037)	-0.030(0.026)	-0.01(0.036)	-0.053(0.034)
Unemployed	-0.03(0.061)	0.132(0.094)	-0.034(0.089)	-0.059(0.062)	0.118(0.093)	-0.045(0.087)
Not in the labour force	0.000(0.05)	-0.061(0.085)	0.011(0.065)	-0.024(0.049)	-0.074(0.085)	0.001(0.064)
Others	-0.032(0.065)	0.026(0.100)	-0.008(0.088)	-0.062(0.065)	0.01(0.098)	-0.020(0.087)
Sex (Female)	-0.083**(0.032)	-0.057(0.045)	-0.069*(0.04)	-0.074**(0.032)	-0.051(0.045)	-0.064(0.039)
Constant	0.037(0.092)	0.586***(0.146)	0.513***(0.14)	0.091(0.091)	0.609***(0.145)	0.531***(0.139)
Rural dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1326	954	948	1326	954	948
R-squared	0.402	0.167	0.294	0.398	0.166	0.293

*Note: (i) the probit regression reports the marginal effect (ii) *,** and *** indicate significance at 10%, 5% and 1% respectively (iii) fibankacc is a dummy variable which takes 1 if a household member own a bank account; fiuseatm is a dummy variable which takes 1 if a household member use ATMs/debit cards for financial transactions and fiusemobileis a dummy which assumes 1 if a household memebr use mobile/internet banking for financial transactions*

Table 6 reports the two-stage least squares (2SLS) regression, which shows the impact of total migrant remittance on financial inclusion in Nigeria, while Table 7 presents the disaggregated analyses of migrant (internal and international) remittances on financial inclusion in Nigeria.

The 2SLS regression estimates collaborate the results of the LPM and Probit estimates. However, the 2SLS is more robust as it controls for potential endogeneity between remittance and financial inclusion. The result shows that remittances have a positive and significant effect on the probability that households will own a bank account. The positive relationship between remittance and financial inclusion resulting from households owning a bank account is plausible given that higher remittance provides households with excess cash for some period and increases the demand for savings deposit, since financial institutions will offer the households a safe place to keep their excess cash. The results are in line with previous findings (Demirguc-Kunt et al., 2011; Anazoategui et al., 2013).

The coefficient on remittances has a positive and statistically significant relationship with the probability that a household will use mobile/internet banking for financial transactions. This further confirms the previous results using the LMP and Probit estimates. The significant remittance coefficients suggest that higher migrant remittance increases the probability of a household using mobile/internet banking. However, the coefficient of remittances is not significant when financial inclusion was proxied by the use of ATMs/debit cards for financial transactions. This suggests that remittance does not affect the likelihood that a household member will use ATMs/debit cards for financial transactions. A similar result was obtained when the disaggregated migrant remittance (internal and international remittances) was considered.

Table 6: Impact of Remittances on Financial Inclusion (instrumental variable method)

	Total Remittance		
	own a bank account (fibankacc)	use ATMs/debit cards (fiuseatm)	mobile/internet banking (fiusemobile)
Log of remittance	0.032***(0.01)	-0.011(0.013)	0.018*(0.01)
Age of adult	0.042***(0.003)	0.025***(0.005)	0.018***(0.004)
Number of adult in HH	0.013**(0.006)	0.012(0.009)	0.001(0.008)
Adults education	-0.002(0.001)	-0.005**(0.002)	-0.006***(0.002)
% of HH < 18 yrs	0.001(0.001)	-0.001*(0.001)	-0.001*(0.001)
% of female adults in HH	0.001(0.001)	0(0.001)	0(0.001)
Destination of Migrants			
High income	-0.031(0.03)	0.033(0.041)	0.039(0.036)
Middle income	-0.019(0.045)	0.141**(0.055)	0.048(0.061)
Low income	0.008(0.051)	-0.092(0.08)	-0.029(0.078)
Others	0.06(0.075)	0.044(0.108)	0.014(0.085)
Activity of Migrant			
Self employed	-0.014(0.035)	-0.041(0.048)	-0.015(0.045)
Student	0.144**(0.064)	-0.076(0.085)	0.055(0.077)
Unemployed	0.09(0.076)	0.064(0.109)	0.037(0.105)
Not in the labour force	0.089(0.064)	-0.129(0.097)	0.069(0.076)
Others	0.106(0.084)	-0.053(0.121)	0.074(0.111)
Sex (Female)	-0.138***(0.041)	-0.023(0.054)	-0.105**(0.048)
Constant	-0.103(0.107)	0.658***(0.166)	0.424***(0.156)
Rural dummy	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes
Observations	1,323	951	945
R-squared	0.335	0.146	0.265
KP rk LM statistic (P-value)	63.177	45.518	44.180
	(0.000)	(0.000)	(0.000)
CD Wald F statistic)	35.140	25.784	24.972
Sargan stat. (p-value)	10.819	9.527	0.664
	(0.001)	(0.0020)	(0.4153)

*Note: *,** and *** indicate significance at 10%, 5% and 1% respectively*

Table 7: Impact of Remittances on Financial Inclusion (instrumental varaible method)

	Internal Remittances			International Remittance		
	own a bank account (fibankacc)	use ATMs/debit cards (fiuseatm)	mobile/internet banking (fiusemobile)	own a bank account (fibankacc)	use ATMs/debit cards (fiuseatm)	mobile/internet banking (fiusemobile)
Log of remittance	0.032***(0.01)	-0.011(0.014)	0.019*(0.011)	0.082***(0.026)	-0.005(0.022)	0.033*(0.018)
Age of adult	0.042***(0.003)	0.025***(0.005)	0.018***(0.004)	0.038***(0.004)	0.026***(0.005)	0.017***(0.004)
Number of adult in HH	0.014**(0.006)	0.012(0.009)	0.001(0.008)	0.008(0.008)	0.01(0.009)	0.000(0.009)
Adults education	-0.002(0.001)	-0.005**(0.002)	-0.006***(0.002)	-0.004*(0.002)	-0.006***(0.002)	-0.006***(0.002)
% of HH < 18 yrs	0.001(0.001)	-0.002*(0.001)	-0.001*(0.001)	0.001(0.001)	-0.001(0.001)	-0.002*(0.001)
% of female adults in HH	0.001(0.001)	0.000(0.001)	0.000(0.001)	0.001(0.001)	0(0.001)	0(0.001)
Destination of Migrants						
High income	-0.021(0.029)	0.03(0.039)	0.044(0.035)	-0.476***(0.161)	0.046(0.138)	-0.128(0.118)
Middle income	-0.01(0.044)	0.138**(0.054)	0.053(0.061)	-0.392***(0.143)	0.155(0.126)	-0.100(0.115)
Low income	0.014(0.052)	-0.094(0.08)	-0.025(0.078)	-0.249**(0.1)	-0.073(0.103)	-0.129(0.093)
Others	0.068(0.074)	0.041(0.108)	0.018(0.085)	-0.278*(0.146)	0.069(0.136)	-0.117(0.114)
Activity of Migrant						
Self employed	-0.014(0.035)	-0.042(0.048)	-0.015(0.045)	-0.004(0.046)	-0.026(0.045)	-0.02(0.045)
Student	0.144**(0.064)	-0.076(0.086)	0.057(0.078)	0.152**(0.073)	-0.027(0.069)	0.035(0.067)
Unemployed	0.090(0.076)	0.063(0.11)	0.039(0.105)	0.082(0.091)	0.103(0.099)	0.01(0.097)
Not in the labour force	0.090(0.064)	-0.13(0.097)	0.071(0.077)	0.066(0.066)	-0.096(0.086)	0.03(0.073)
Others	0.105(0.084)	-0.053(0.121)	0.075(0.111)	0.147(0.1)	-0.011(0.115)	0.063(0.102)
Sex (Female)	-0.136***(0.041)	-0.023(0.054)	-0.105**(0.048)	-0.192***(0.062)	-0.04(0.055)	-0.111**(0.051)
Constant	-0.109(0.108)	0.660***(0.168)	0.419***(0.157)	0.165(0.122)	0.594***(0.146)	0.552***(0.147)
Rural dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,323	951	945	1,323	951	945
R-squared	0.336	0.146	0.265	-0.120	0.163	0.198
KP rk LM statistic (P-value)	63.028 (0.000)	44.742 (0.000)	43.390 (0.000)	20.254 (0.000)	19.963 (0.000)	19.509 (0.000)
CD Wald (F statistic)	35.307	25.485	24.647	10.569	10.709	10.540
Sargan stat. (p-value)	10.903 (0.001)	9.524 (0.002)	0.659 (0.416)	3.039 (0.0813)	10.622 (0.0011)	0.221 (0.638)

*Note: *,** and *** indicate significance at 10%, 5% and 1% respectively*

In line with our expectations, migrant destination (in terms of middle-income countries) influences household financial inclusion. Households with a migrant in middle-income countries are more likely to use ATMs/debit cards for financial transactions, compared to households with an internal migrant.

Furthermore, the number of adults in a household increases the probability that a household owns a bank account, while the age of adults in a household increases the likelihood that a household member will own a bank account, use ATMs/ debit cards for financial transactions as well as us mobile/internet banking for financial transactions. Also, households with a student migrant are more likely to own a bank account, while households with female migrants are less likely to own a bank account as well as use mobile/internet banking for financial transactions, compared to households with a male migrant.

5.1   Robustness Check using Propensity Score Matching (PSM) Method

Robustness checks are conducted using Propensity Score Matching (PSM) to address possible selection bias resulting from the selection of unobservable characteristics that may lead to a correlation between the propensity of receipt of remittances and the probability of using financial products (financial inclusion). According to Rubin, (1974) and Rosenbaum and Rubin (1983), the PSM method allows for correction of possible selection by comparing each remittance-receiving household with similar non-remittance-receiving households based on their propensity scores.

In the PSM method, the financial inclusion status for the non-remittance-receiving households (control group) is interpreted as the counterfactual outcome for the remittance-receiving households (treated group) in the absence of receipt of remittances. In comparison with other estimation methods, when households self-select into a treatment group, the PSM gives a more accurate non-experimental estimate (Dehejia and Wahba, 2002; McKenzie et al. 2006; and White, 2006). Consider the illustration below:

Let $D_i = 1$ if household i received remittances and $D_i = 0$ if not; let Y_{1i} be the outcome of interest (financial inclusion) for a remittance-receiving household and Y_{0i} be the outcome for a non-remittance-receiving household. Therefore, the treatment effect is defined as the difference between remittance receipt households and non-remittance receipt households.

$$\Delta Y_i = E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 1) \tag{2}$$

From Equation (5), it is not possible to observe households in two different states simultaneously. The outcome of the household receiving remittances can be observed but we cannot observe the same outcome in the absence of remittance receipt (counterfactual). The PSM estimates are based on the conditional independence assumption, which states that conditional on X, the potential outcomes are independent of the treatment status (receipt of remittances). After controlling for the observable covariates X, the treatment assignment is as good as random (Lechner, 1999).

Using the PSM, our parameter of interest is the average treatment effect on the treated (ATT), which is calculated by subtracting the average treatment effect of the treated group from that of the control at a particular propensity score.

$$ATT = E[Y|D = 1, P(X)] - E[Y|D = 0, P(X)] \tag{3}$$

Table 6 presents results of the impact of remittance receipts on three indicators of financial inclusion: ownership of a bank account, the use of ATMs/debit cards for financial transactions, and the use of internet/mobile banking for financial transactions, using PSM.

In Table 8, we used three matching algorithms for the Propensity Score Matching method. They include the nearest neighbour matching (NN), kernel matching (Kernel), and stratification matching respectively. The three different matching algorithms produce very similar estimates of the impact of remittances on financial inclusion.

Table 8: The Impact of Remittances on Financial Inclusion (Propensity Score Matching method)

Outcome variables	Matching algorithm	Panel 1: Total Remittances			Panel 2: Internal Remittance			Panel 3: International Remittance		
		ATT	S.E	t-test	ATT	S.E	t-test	ATT	S.E	t-test
own a bank account	NN matching	0.128***	0.043	2.958	0.128***	0.052	2.470	-0.003	0.035	-0.086
own a bank account	Kernel	0.120***	0.035	3.471	0.120***	0.040	2.960	0.035	0.030	1.177
own a bank account	Stratification	0.109***	0.040	2.703	0.109***	0.039	2.822	0.037	0.030	1.230
use ATMs/debit cards	NN	-0.091*	0.053	-1.714	-0.091*	0.054	-1.679	-0.047	0.043	-1.089
use ATMs/debit cards	Kernel	-0.003	0.041	-0.073	-0.003	0.046	-0.066	-0.063	0.043	-1.489
use ATMs/debit cards	Stratification	0.007	0.045	0.145	0.007	0.048	0.136	-0.045	0.038	-1.177
mobile/internet banking	NN	-0.096	0.067	-1.438	-0.096	0.061	-1.556	-0.074	0.056	-1.337
mobile/internet banking	Kernel	-0.047	0.042	-1.132	-0.047	0.046	-1.025	-0.076*	0.043	-1.770
mobile/internet banking	Stratification	-0.050	0.051	-0.980	-0.050	0.050	-0.991	-0.066	0.049	-1.343

*Note: (i) *, ** and *** indicate significance at 10%, 5% and 1% respectively (ii) NN refers to nearest neighbor*

In all three matching algorithms, the counterfactual approach shows that total remittances significantly increase deposit account presence by 10.9-12.8 percent. These results show that remittance receipts have a positive impact on financial inclusion. This lends credence to earlier findings of studies on the impact of remittances on financial inclusion such as Anaszoategui et al. (2013); Nyamongo and Misati (2011); Aggarwal et al. (2010); Ambrosius and Cuecuecha (2016). This finding is also consistent with the view that remittance receipts help in financial development.
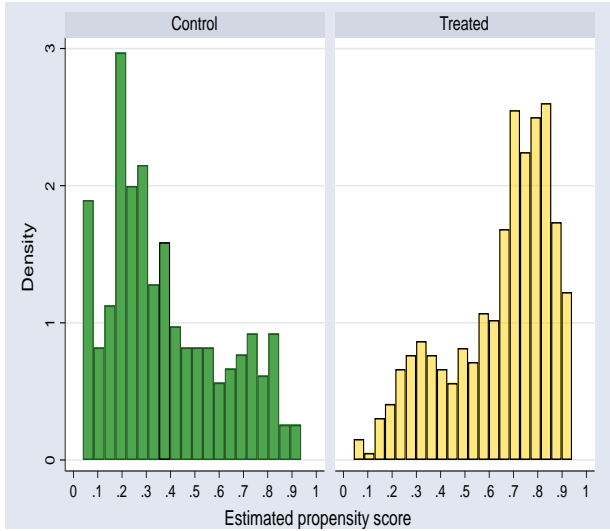
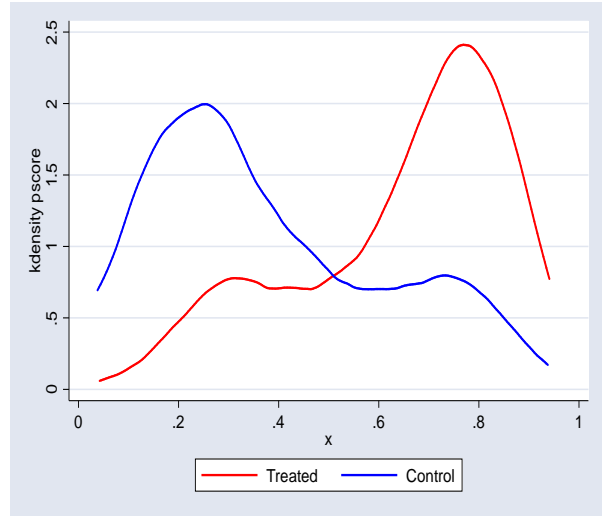*Figure 4: Histogram of Propensity Scores of Treated and Control Groups*

Figure 5: Kernel Graphs of Propensity Score for Treated and Control Groups

6   Summary and Conclusion

This study examined the effects of migrants' remittances on the use of, formal bank services among households using the World Bank's 2009 Migration and Remittances Household Survey for Nigeria. The results show that the receipt of remittances increases the use of bank accounts and mobile/or internet banking for financial transactions. However, remittance flows do not influence households' use of ATMs/debit cards for financial transactions. The study demonstrates that remittances are important in enhancing households' financial inclusion status.

The positive relationship between remittances and access to formal financial services obtained from this study can be used to inform policy decisions. For instance, Sub-Saharan Africa, one of the poorest regions in the world, remains one of the highest-cost regions in terms of receiving remittances from abroad. The high-cost associated with receipt of remittances in Sub-Saharan Africa from abroad has the potential to reduce the flow or amount of remittances to the region, and consequently reduce the extent of financial inclusion.

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Appendix

Figure 1A: Annual Remittances Flow to Nigeria, from 1970-2014
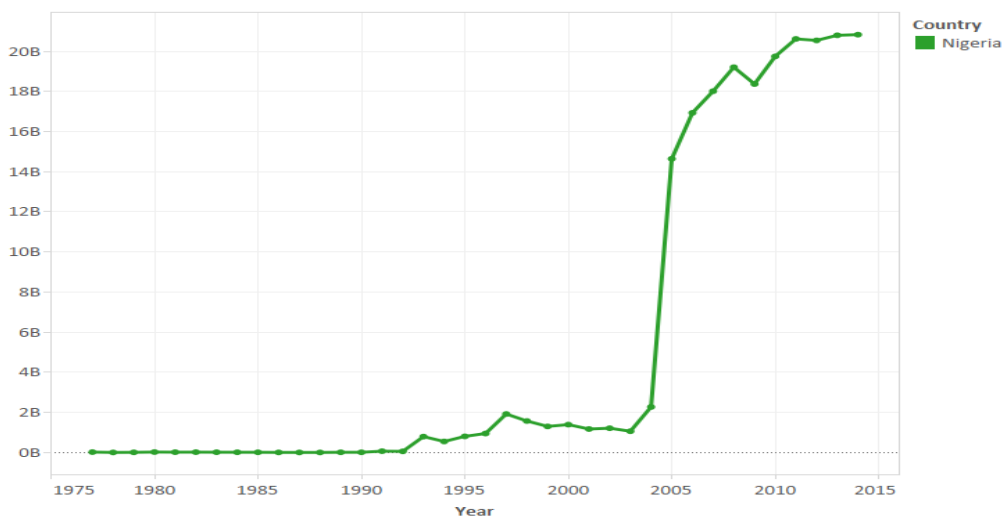
Source: Author's calculation using data from Migration policy institute data

Table IA: First Stage Results from Instrumental Variables Estimation (total remittance)

Variables	Total Remittance		
	Fibankacc	fiuseatm	fiusemobile
Share of HH receiving remittance by municipality	5.221***(0.934)	6.186***(1.194)	6.159***(1.194)
Log. of average remittance by municipality	0.69***(0.147)	0.641***(0.189)	0.618***(0.19)
Adults education	0.018(0.039)	-0.092*(0.052)	-0.089*(0.053)
Number of adult in HH	0.218***(0.079)	0.266***(0.086)	0.241***(0.086)
Age of adult	0.063***(0.018)	0.068***(0.024)	0.067***(0.024)
% of HH < 18 yrs	0.008**(0.008)	-0.017*(0.01)	-0.017*(0.01)
% of female adults in HH		-0.021(0.015)	-0.02(0.015)
Destination of Migrants	0.012**(0.012)		
High income	1.606***(0.364)	1.622***(0.392)	1.651***(0.391)
Middle income	0.727(0.729)	1.251(0.802)	1.241(0.8)
Low income	-1.163(0.713)	-0.333(0.869)	-0.587(0.866)
Others		-0.968(1.237)	-0.99(1.232)
Activity of Migrant	-0.848(1.074)		
Self employed	-1.387***(0.418)	-1.741***(0.505)	-1.784***(0.506)
Student	-5.316***(0.395)	-5.482***(0.448)	-5.568***(0.45)
Unemployed	-4.444***(0.83)	-4.166***(1.058)	-4.218***(1.055)
Not in the labour force	-3.065***(0.646)	-2.706***(0.84)	-2.711***(0.842)
Others	-4.958***(0.849)	-4.384***(1.136)	-4.45***(1.134)
Sex (Female)	2.186***(0.438)	2.242***(0.545)	2.114***(0.545)
_cons	1.81**(1.81)	-3.954*(2.262)	-3.593(2.265)
Rural dummy	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes
F-statistics	36.67***	26.00***	25.18***

*Note: *,** and *** indicate significance at 10%, 5% and 1% respectively*

Table IB: First Stage Results from Instrumental Variables Estimation (internal and international remittances)

Variables	Internal Remittance			International Remittance		
	Fibankacc	fiuseatm	fiusemobile	fibankacc	fiuseatm	fiusemobile
Share of HH receiving remittance by municipality	5.107***(0.911)	5.959***(1.163)	5.929***(1.162)	1.461*(0.835)	1.189**(1.189)	1.19**(1.190)
Log. of average remittance by municipality	0.67***(0.143)	0.62***(0.184)	0.597***(0.184)	0.451***(0.125)	0.498***(0.168)	0.49***(0.169)
Adults education	0.016(0.038)	-0.09*(0.051)	-0.087*(0.051)	0.04(0.034)	-0.023(0.048)	-0.023(0.048)
Number of adult in HH	0.21***(0.077)	0.256***(0.084)	0.232***(0.085)	0.143*(0.076)	0.088**(0.088)	0.163*(0.089)
Age of adult	0.061***(0.017)	0.066***(0.023)	0.066***(0.023)	0.053***(0.015)	0.027(0.022)	0.026(0.022)
% of HH < 18 yrs	0.008**(0.008)	-0.017*(0.009)	-0.017*(0.009)	-0.008(0.007)	-0.004(0.009)	-0.004(0.009)
% of female adults in HH	0.012**(0.012)	-0.02(0.015)	-0.019(0.015)	-0.011(0.011)	-0.009(0.014)	-0.008(0.014)
Destination of Migrants						
High income	1.264***(0.35)	1.278***(0.377)	1.304***(0.377)	6.006***(0.367)	5.999***(0.402)	6.033***(0.403)
Middle income	0.435(0.688)	0.928(0.758)	0.917(0.756)	4.768***(0.752)	5.191***(0.809)	5.182***(0.807)
Low income	0.674**(0.674)	-0.527(0.819)	-0.754(0.82)	2.643***(0.729)	3.009***(0.951)	2.707***(0.94)
Others	-1.064(1.022)	-1.147(1.177)	-1.167(1.172)	3.685***(1.049)	3.458***(1.224)	3.437***(1.223)
Activity of Migrant						
Self employed	-1.353***(0.407)	-1.699***(0.491)	-1.743***(0.492)	-0.634*(0.364)	-0.842*(0.46)	-0.86*(0.462)
Student	-5.202***(0.383)	-5.355***(0.434)	-5.439***(0.436)	-2.111***(0.351)	-2.466***(0.408)	-2.523***(0.411)
Unemployed	-4.365***(0.806)	-4.098***(1.028)	-4.148***(1.025)	0.654**(0.654)	-1.476*(0.873)	-1.513*(0.874)
Not in the labour force	-3.031***(0.634)	-2.707***(0.817)	-2.714***(0.819)	-0.867*(0.508)	-0.321(0.782)	-0.315(0.784)
Others	-4.834***(0.826)	-4.288***(1.091)	-4.353***(1.089)	-2.314***(0.6)	0.962**(0.962)	0.961**(0.961)
Sex (Female)	2.1***(0.425)	2.158***(0.527)	2.039***(0.527)	1.5***(0.425)	1.479***(0.545)	0.544**(0.544)
_cons	-3.366*(1.761)	-3.579(2.203)	-3.227(2.205)	-6.099***(1.612)	-7.104***(2.032)	-6.926***(2.042)
Rural dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	36.62***	25.50***	24.67***	10.48***	10.50***	10.27***

*Note: *,** and *** indicate significance at 10%, 5% and 1% respectively*

Table IIA: Probit Regression Result (total remittance)

	Total Remittance		
	Fibankacc	fiuseatm	fiusemobile
Lnrem	0.01***(0.003)	0.004(0.003)	0.002(0.003)
Adults education	0.047***(0.004)	0.026***(0.005)	0.022***(0.006)
Number of adult in HH	0.022***(0.008)	0.006(0.009)	0.008(0.009)
Age of adult	0.001(0.002)	-0.006***(0.002)	-0.007***(0.002)
% of HH < 18 yrs	0(0.001)	-0.002*(0.001)	-0.002**(0.001)
% of female adults in HH	0(0.001)	0(0.001)	-0.001(0.001)
Destination of Migrants			
High income	0.032(0.035)	0.015(0.036)	0.088**(0.04)
Middle income	0.026(0.064)	0.156**(0.064)	0.081(0.069)
Low income	-0.023(0.062)	-0.12(0.098)	-0.033(0.084)
Others	0.039(0.068)	0.047(0.083)	0.021(0.114)
Activity of Migrant			
Self employed	-0.067*(0.039)	-0.016(0.045)	-0.047(0.042)
Student	0.005(0.037)	0.002(0.043)	-0.047(0.042)
Unemployed	-0.019(0.078)	0.113(0.081)	-0.022(0.11)
Not in the labour force	-0.004(0.056)	-0.063(0.086)	0.003(0.082)
Others	-0.017(0.075)	0.024(0.095)	-0.017(0.105)
Sex (Female)	-0.103**(0.048)	-0.055(0.052)	-0.077*(0.043)
Rural dummy	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes
Observations	1,326	954	948
R-squared	0.376	0.1504	0.2643

*Note: (i) the probit regression reports the marginal effect (ii) *,** and *** indicate significance at 10%, 5% and 1% respectively*

Table IIB: Probit Regression Result (internal and international remittances)

	Internal Remittance			International Remittance		
	fibankacc	fiuseatm	fiusemobile	fibankacc	fiuseatm	fiusemobile
Lnrem	0.01***(0.003)	0.004(0.003)	0.003(0.003)	0.003(0.003)	0.002(0.003)	0.001(0.003)
Adults education	0.047***(0.004)	0.026***(0.005)	0.022***(0.006)	0.022***(0.006)	0.026***(0.005)	0.022***(0.006)
Number of adult in HH	0.022***(0.008)	0.006(0.009)	0.008(0.009)	0.008(0.009)	0.007(0.009)	0.009(0.009)
Age of adult	0.001(0.002)	-0.006***(0.002)	-0.007***(0.002)	-0.007***(0.002)	-0.006***(0.002)	-0.006***(0.002)
% of HH < 18 yrs	0(0.001)	-0.002*(0.001)	-0.002**(0.001)	-0.002**(0.001)	-0.002**(0.001)	-0.002**(0.001)
% of female adults in HH	0(0.001)	0(0.001)	-0.001(0.001)	-0.001(0.001)	0(0.001)	-0.001(0.001)
Destination of Migrants						
High income	0.035(0.035)	0.016(0.036)	0.088**(0.04)	0.088**(0.04)	0.012(0.041)	0.087*(0.046)
Middle income	0.029(0.063)	0.156**(0.064)	0.082(0.069)	0.082(0.069)	0.153**(0.066)	0.081(0.072)
Low income	-0.021(0.062)	-0.119(0.098)	-0.032(0.084)	-0.032(0.084)	-0.126(0.099)	-0.037(0.083)
Others	0.042(0.067)	0.048(0.083)	0.022(0.114)	0.022(0.114)	0.039(0.087)	0.018(0.115)
Activity of Migrant						
Self employed	-0.067*(0.039)	-0.015(0.045)	-0.047(0.042)	-0.047(0.042)	-0.021(0.045)	-0.051(0.041)
Student	0.006(0.037)	0.004(0.043)	-0.046(0.042)	-0.046(0.042)	-0.016(0.041)	-0.058(0.038)
Unemployed	-0.019(0.078)	0.114(0.081)	-0.021(0.11)	-0.021(0.11)	0.102(0.085)	-0.03(0.107)
Not in the labour force	-0.004(0.056)	-0.062(0.086)	0.004(0.082)	0.004(0.082)	-0.077(0.087)	-0.004(0.08)
Others	-0.017(0.075)	0.025(0.095)	-0.017(0.105)	-0.017(0.105)	0.01(0.097)	-0.028(0.101)
Sex (Female)	-0.103**(0.048)	-0.056(0.052)	-0.077*(0.043)	-0.077*(0.043)	-0.048(0.052)	-0.073*(0.043)
Rural dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,326	954	948	1,326	954	948
R-squared	0.3768	0.1505	0.2644	0.3709	0.1493	0.263

Note: (i) the probit regression reports the marginal effect (ii) *,** and *** indicate significance at 10%, 5% and 1% respectively