

# The impact of remittances on household poverty

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## Keywords

Remittances, Household Poverty, Heckman's Endogeneity Test, Rural Areas, Urban Areas, Geo-Political Zones.

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## Abstracts

*In 2015, the inflow of international remittances to Nigeria stood at \$20.5 billion (World Bank, 2016). This represents 3.5% of the global flow and 58.5% of the Sub-Saharan Africa's estimate. In spite of this increased flow, household poverty has remained pervasive in Nigeria. Previous studies have focused on the impact that aggregate remittances have on household poverty without considering the roles of the different types of remittances (cash, food and other remittances) on household poverty in Nigeria. This study was, therefore, designed to analyse the impact of the various types of remittances on household poverty across the rural and urban areas and the six geo-political zones of Nigeria. The study was premised on consumption theory which incorporates remittances as a form of income that affects household consumption. The methodology was similar to that of Mukherjee and Benson (2003). In this study, the Ordinary Least Squares (OLS) was used to estimate the mean of the per capita expenditures (which were compared with the absolute poverty line) of remittance-receiving households against households, community and regional profiles. Probit regression was used as robustness checks on the OLS estimates. In order to examine the effect of endogeneity, the Heckman's two-stage estimation technique was deployed. The impact of aggregate, cash, food and other remittances on household poverty are chequered in rural, urban and across the six geo-political zones. These impacts are felt strongly in the rural and urban areas as well as in the North Central, South East and South West zones than in other geo-political zones of Nigeria.*

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## 1. Introduction

Nigeria ranks as the largest recipient of remittance transfer in Sub-Saharan Africa in 1990 (Nyamongo *et al.* 2012). In 2004, remittance flow to Nigeria (from official source only) stood at about US\$2 billion; in 2005, the figure rose by over 600% to \$14.6 billion; and in 2014, the figure had risen to about \$28.6 billion. In spite of the significant increase in remittance transfer to Nigeria, its impact on poverty among households was unclear in the country. An important finding by the United Kingdom (UK) Department for International Development (DFID, 2006) on Nigeria's migration history and remittances was the ethnic and regional differences in the migrant population. Of the 250 distinct ethnic groups that formed Nigeria, two major ethnic groups, the Ibos from the South-East and Yoruba from the South-West constituted a significant proportion of the migrant population. Other ethnic communities that predominated the migrant's population were the Edos and Ogonis. Thus, migration history was in favour of the Southern regions of Nigeria more than the North (NBS, 2010). Long history of migration had been associated with prevalence of remittances (Taylor and Mora, 2005). However, estimates from this study showed that the North Central zone was most favoured.

Available statistics from the National Bureau of Statistics (NBS, 2010) had also shown that there were differences in the poverty trend between the rural and urban areas and in the different geo-political zones that constituted Nigeria. In 2010, the percentage of absolute poverty was earmarked to be 66.1 per cent in the rural areas of the country compared to 52 per cent recorded in the urban areas, relative poverty stood at 71.2 per cent in the rural part of Nigeria relative to 71.8 per cent recorded in the urban areas. Considering the different geo-political zones that made up Nigeria, absolute poverty stood at 49.8 per cent in the South-West, 58.7 per cent in the South-East, South-West 55.9 per cent, North-Central 59.5 per cent, North-East 69 per cent and North-West 70 per cent. In a similar fashion, the proportions of relative poverty in 2010 were: South-West 59.1 per cent, South-East 67 per cent, South-South 63.8 per cent, North-Central 67.5 per cent, North East 76.3 per cent and North-West 77.7 per cent.

Given the fact that there were differences in the remittances that were received in the different parts of Nigeria as well as the poverty trends across the country's geo-political divides, can one attribute the latter to the former? Much is not known about the impacts of remittances on poverty between rural and urban households in Nigeria and in the different geo-political zones that constituted the country. Therefore, the key research questions of this study are: How do remittances affect poverty among households in Nigeria? What is the proportion of remittances to rural households as opposed to urban households? How do remittances affect households' poverty in the geo-political zones of Nigeria?

### **1.1 Objective of Research**

Broadly, the study evaluates the impact of remittances on households' poverty in Nigeria.

Specifically, the study

1. analyses the impact of remittances on households' poverty across rural and urban areas and in the geo-political zones of Nigeria.
2. profiles remittances' flow in the rural areas, urban areas and in the geo-political zones of Nigeria
3. describes the distribution of poverty in the rural areas, urban areas and in the geo-graphical areas of Nigeria.

## **2. Background of The Study**

This section provides background information on remittances and poverty situation in Nigeria.

### **2.1.1 Classifications of Households by Remittances**

The Table 2.1 shows that the survey data consists of more than 95% of non-remittance-receiving households and less than 5% of remittance-receiving households. Cash remittance recipients constituted about 4.6% of surveyed households, food remittance-receiving households were about 0.5% while other remittances' recipient households approximated 0.19%. Cash remittance recipients were high relative to others because it was more cost-effective and easier to transfer cash relative to other channels of remittance transfer to left-behind family members.

Male-headed households received more cash remittances (4.65%) than female-headed households (4.41%). Culturally, in most households in Nigeria, the most elderly male personality is acknowledged as the heads of such households and the responsibility of providing for these household's rests on the shoulders of these household heads. This may be responsible for the higher cash remittance flow to male-headed households. The reverse was the case with food remittance flow as female-headed households received 0.81% of it compared to 0.43% obtained by male-headed households. Quite often than not, women are known to be better cooks than men and, in most households in Nigeria, activities relating to the kitchen fall under the purview of the women. Thus, they appreciated food remittances more than the male-folks. In the same vein, 0.44% of other remittances went to female-headed households relative to 0.14% that was given to male-headed ones. Social engagements rest more with the females than males and

in a typical African culture, while the adult males are expected to fend for their families, the females are left with the peripheral of taking care of the home-fronts like managing domestic chores and taking care of the children. Thus, other remittances flowed to female-headed households than the male ones. In contemporary times, women are becoming economically active in the home-fronts and are seen to be performing roles exclusively reserved for the men. Households with in-active headship received 0.63% of food remittances relative to 0.45% obtained by the active ones, 30.61% of other remittances compared to 20.25% received by the latter. This may be based on the presumption by migrants that the aged could not fend for themselves because of their feeble strengths and would need some kind of supports from them in the form of remittances' receipts.

Table 2.2 showed that urban households had more cash remittances than rural households. However, rural households got more food and other remittances than the urban. Furthermore, the southern part of Nigeria received more remittances from migrants than the north. Households in the urban areas received 50.5% of cash remittances compared to 49.5% obtained by households in the rural areas. The accessibility of financial services and money transfer agencies in urban sector were contributive factors to this dominance. Ironically, the quantum of food remittance received by rural households was 56.6% as against 43.4% recorded by urban households. Usually, people living in the rural areas are more concerned with subsistence lifestyle and farming than in the urban areas where inhabitants quest for 'white collar' jobs, sophistication and luxurious acquisitions. Households in the rural sector scored 55.8% of their receipts of other remittances from migrants relative to 44.2% which was scored by their counterparts in urban areas. Most rural areas in Nigeria lack the basic necessities of life like good roads, hospitals and educational institutions, adequate and well efficient drugs, amongst others. Therefore, migrants sent more of such items and facilities to rural areas than urban centers.

Table 2.1. Distribution of Households based on Types of Remittances Received, Gender, Marital Status and Age Groups of Household Heads

Cash Remittances	Male	Female	Total	Married	Unmarried	Total	Active (15-60 yrs)	Inactive (61-95 yrs)	Total
Remittance- Receiving households	59,118 (95.35%)	13,454 (95.59%)	72,572 (95.40%)	2,806 (4.57%)	698 (4.78%)	3,504	2,812 (4.60%)	692 (4.50%)	3,504 (4.60%)
Non-Remittance- Receiving households	2,883 (4.65%)	621 (4.41%)	3,504 (4.6%)	58,652 (95.43%)	13,919 (95.22%)	72,571	57,916 (95.40%)	14,748 (95.5%)	72,664 (95.40%)
Total	62,001	14,075	76,076	61,458	14,617	76,075	60,728	15,440	76,168
Food Remittances									
Remittance- Receiving households	266 (0.43%)	114 (0.81%)	380 (0.50%)	278 (0.45%)	102 (0.70%)	380	282 (0.45%)	98 (0.63%)	380 (0.50%)
Non-Remittance- Receiving households	61,735 (99.57%)	13,961 (99.19%)	75,696 (99.50%)	61,180 (99.54%)	14,515 (99.30%)	75,695	60,446 (99.54%)	15,342 (99.95%)	75,788 (99.50%)
Total	62,001	14,075	76,076	61,458	14,617	76,075	60,728	15,440	76,168
Other Remittances									
Remittance- Receiving households	85 (0.14%)	62 (0.44%)	147 (0.19%)	81 (0.13%)	66 (0.45%)	147	15,395 (20.25%)	45 (30.61%)	15,440 (20.27%)
Non-Remittance- Receiving households	61,916 (99.86%)	14,075 (99.56%)	75,929 (99.81%)	61,377 (99.87%)	14,551 (99.55%)	75,928	60,626 (79.75%)	102 (69.39%)	60,728 (79.73%)
Total	62,001	14,075	76,076	61,458	14,617	76,075	76,021	147	76,168

Source: Author's computation from HNLSS 2009

A breakdown of remittances received by households in the geographical zones showed that remittance recipients from the South-South region of Nigeria had the highest share of cash remittances received with 8.46%. This was followed by households from the South-West with a figure of 6.15%. The others included: North-Central 6.01%; South-East 2.97%; North-West 1.74% and North-East 0.09%. Cash remittance flow was higher in the southern part of Nigeria (with the exception of the South-East) because of the country's migration pattern which was hitherto in favour of this region more than the north as seen in this study's background. Long history of migration was associated with the prevalence of remittances (Taylor and Mora, 2005). There was a similar trend in the pattern of food remittance and other remittances to the regions. The South-South recorded the greatest percentage of households that received food remittances (1.41%). This was followed by the South-East (0.62%), South-West (0.40%), North-West (0.30%), North-Central (0.28%) and North-East (0.01%). In the case of other remittances received, there was a slight twist as the North-West was among the list of high remittances' recipients. The South-South region of Nigeria had the major flow with 44%, the South-East ranked next with 30%, the North-West and South-West had 25% and 11% respectively, the North-Central got 6% while North-East earmarked 2%. The factors responsible for the alteration in the pattern of other remittances flow to the regions were not forceful. It was generally agreed that there was a high magnitude of infant and maternal mortality rate in the North than in the southern part of Nigeria. Besides, while free education was declared in the southern part of Nigeria some years ago, this was not the case in the North. The exigency to provide these needs not only fell on the doorsteps of government, but also the migrants. Furthermore, there had been relative peace in the North-Western part of Nigeria compared to their contemporaries in the North.

Table 2.2. Distribution of Households by Sector and Geo-Political Zones

Cash Remittance	Non-Remittance household		Remittance-Receiving household		Total		
Urban	26,574 (36.6%)		1,771 (50.5%)		28,425		
Rural	45,918 (63.3%)		1,733 (49.5%)		47,651		
Total	72,572		3,504		76,076		
Food Remittance							
Urban	28,260 (37.3%)		165 (43.4%)		28,425		
Rural	47,736 (63.1%)		215 (56.6%)		47,651		
Total	75,696		380		76,076		
Other Remittance							
Urban	28,360 (37.1%)		65 (44.2%)		28,425		
Rural	47,569 (62.6%)		82 (55.8%)		47,651		
Total	75,929		147		76,076		
Geo-Political Zones							
Cash Remittance	North-Central	North-East	North-West	South-East	South-South	South-West	Total
Remittance-Receiving Household	786 (6.01%)	78 (0.09)	225 (1.74%)	353 (2.97%)	896 (8.46%)	1,166 (6.15%)	3,504 (4.61%)
Non-Remittance Receiving H/d	12,292 (93.9%)	8,532 (99.01%)	12,741 (98.26%)	11,521 (97.03%)	9,697 (91.54%)	17,789 (93.8%)	76,076 (95.39%)
Total	13,078	8,610	12,966	11,874	10,593	18,955	76,076
Food Remittance							
Remittance-Receiving Household	36 (0.28%)	9 (0.01%)	38 (0.30%)	73 (0.62%)	149 (1.41%)	75 (0.40%)	380 (0.50%)
Non-Remittance Receiving h/d	13,042 (99.72%)	8,601 (99.90%)	12,298 (99.70%)	11,801 (99.38%)	10,444 (98.59%)	18,880 (99.60%)	75,696 (99.50%)

Total	13,078	8,610	12,966	11,874	10,593	18,955	76,076
Other Remittances							
Remittance- Receiving Household	8 (0.06%)	2 (0.02%)	33 (0.25%)	36 (0.30%)	47 (0.44%)	21 (0.11%)	147 (0.19%)
Non-Remittance Receiving Household	13,070 (99.94%)	8,608 (99.98%)	12,933 (99.75%)	11,838 (99.70%)	10,546 (99.56%)	18,934 (99.89%)	75,929 (99.81%)
Total	13,078	8,610	12,966	11,874	10,593	18,955	76,076

Source: Author's computation from HNLSS 2009/10

## 2.2 Poverty Status of Households

Households were classified into various groups based on their poverty status. The poverty benchmark of the HNLSS data of 2009/2010 (using the absolute poverty line) was N56,992.77. All households whose per capita expenditures fell below this benchmark were considered to be poor while those above it were non-poor.

The Table 2.3 showed that poverty was higher among the rural households than their counterparts in the urban areas. It was observed in the table that households received more cash remittances in the urban areas than those in the rural areas and the number of households that received this kind of remittance (in the sample) was higher than food and other remittances. Also, households with married heads were poorer than the un-married. In reality, most households with married heads tend to have more members to cater for than those that are not married. In terms of gender, poverty was more obvious in male-headed households than female-headed ones. In this part of the world (especially in the rural areas), women are more economically active than their husbands in terms of providing for the needs of their children. In the table, the percentage of the non-poor approximated 60% compared to the poor which was 40%. Poverty ranked higher at 48.2% among rural households relative to 26.1% scored by households in urban. Households headed by married persons were poorer than the un-married ones. The proportion of the poor was 43.8% in the former and 23.7% in the latter. It was expected that households whose family heads were married should be having more family members and responsibilities than those whose family heads were un-married. Poverty was lower among female-headed households (25.1%) than male-headed ones (43.3%). This insinuated that females were economically more active than their male counterparts.

Table 2.3. Distribution of Households by Poverty Status across Sector, Marital Status and Gender

Poverty Status	Non-Poor Households	Poor Households	Total
Sector			
Rural	24,675	22,976	47,651
(%)	(51.8%)	(48.2%)	
Urban	21,014	7411	28,425
(%)	(73.9%)	(26.1%)	
Total	45,689	30,387	76,076
	(60.1%)	(39.1%)	
Marital Status			
Unmarried	11,155	3,462	14,617
(%)	(76.3%)	(23.7%)	
Married	34,533	26,925	61,458
(%)	(56.2%)	(43.8%)	
Total (%)	45,688	30,387	76,075
	(60%)	(40%)	

Gender			
Female	10,546	3,529	14,075
(%)	(74.9%)	(25.1%)	
Male	35,143	26,858	62,001
(%)	(56.7%)	(43.3%)	
Total	45,689 (60.1%)	30,387 (39.9%)	76,076

Source: Author's computation from HNLSS 2009/2010

There was statistical evidence that showed that poverty was more pronounced in the northern part of Nigeria than in the southern region. The Table 2.4 unveiled that the proportion of the non-poor was more in the southern zone than in the north. This trend was similar to the pattern of remittance flow in the geo-political zones of Nigeria. In our earlier analysis, it was discovered that there were more remittances' recipients in the southern part of Nigeria than in the north. From Table 2.4, poverty was at its peak in the North-West as it earmarked 64.1% of poverty level in Nigeria. The next zone on the poverty scale was the North-East with 57.4% and this region was followed by the North-Central that scored 44.1%. However, the South-West recorded the least poverty score of 27.0%, seconded by the South-South (37.6%) and then the South-East had 38.0%. Given the prevalence of lower poverty spread in the south compared to the north, one can attribute this development to the fact that this region (south) received more remittances from migrants than their counterparts in the northern part of Nigeria. Furthermore, free education was first introduced in the western region (of which the South West was inclusive) before the north. Thus, many households were encouraged to send their members to school. Some of these members later travelled abroad to receive further education and became integrated in their new locations. They also worked from these areas and sent remittances to members of their families. This was partly responsible for the low level of households' poverty in the South West relative to other zones.

Table 2.4. Geo-Political Distribution of Households by Poverty Status

Poverty Status	Geo-Political Zones						Total
	North-Central	North-East	North-West	South-East	South-South	South-West	
Non-Poor	7,307 (55.9%)	3,672 (42.6%)	4,655 (35.9%)	8,553 (72.0%)	7,670 (72.4%)	13,832 (73.0%)	45,689 (60.1%)
Poor	5,771 (44.1%)	4,938 (57.4%)	8,311 (64.1%)	3,321 (38.0%)	2,923 (37.6%)	5,123 (27.0%)	30,387 (39.9%)
Total	13,078	8,610	12,966	11,874	10,593	18,955	76,076

Source: Author's computation from HNLSS 2009/10

### 3. Literature review

#### 3.1 Theoretical Review of Literature

The linkages between remittances and poverty are embedded within migration theories. Migration theories try to establish the link between migration and development and in the process examine the puzzle whether migration is beneficial to the households. The most beneficial impact of migration is remittances. The debates on the impact of migration on development swing back and forth like a pendulum from optimism until the early 1970s to pessimism until the 1990s, and back again to more optimistic views in recent years. This division in views on migration and development reflects deeper paradigmatic divisions in social theory (*i.e.*, functionalist versus structuralist paradigms) and development theory (*i.e.*, balanced growth versus asymmetric development paradigms). To a considerable extent, this also reflects ideological divisions between neo-liberal and state-centrist views.



Given the shortcomings of the above theories in setting a platform or structure to consider the impact of remittances on households' poverty, this study shall be adopting the consumption theory to analyse this relationship. Precisely, the study hinges its framework on the permanent income hypothesis. The Permanent Income Hypothesis (PIH) proposed by Milton Friedman (1974) stated that households or consumers base their consumption on what they consider their normal income. In doing this, they attempt to maintain a fairly constant standard of living even though their income may vary considerably from time to time. Thus, increases and decrease in income considered to be temporary have little effect on consumption spending. The PIH is premised on the idea that consumption depends on the assumption that consumption depends on what people expects to earn over a considerable period of time. Consumer will try to decipher whether a change in income is temporary or permanent. The former will have small effects on their spending. It is only when consumers become convince that changes in their income is permanent that their consumption change by a sizeable amount. By permanent income, it means average long-run income. According to Friedman, temporary changes in income will have little effect on consumption compared to permanent changes. If household could predict their future income level, they will adjust their consumption level according to their average long run income. The Permanent Income Hypothesis is given by this equation:

$$C_t = b_1 Y_L^t + b_2 Y_L^e + b_3 W_t$$

Where,

$C_t$  = Consumption expenditure in the current period t.

$Y_L^t$  = Income earned from doing some labour in the current period t.

$Y_L^e$  = Average annual income expected to be earned from labour during the future year of work life.

$W_t$  = Wealth currently owned.

$b_i$  represents marginal propensity to consume.

### 3.2 Review of Methodology

Several methodological approaches have been adopted in the study of remittances and poverty. The choice of methodologies has varied based on the focus and coverage of studies, as well as available type of data. In this section, a review of methodology used by previous studies is carried out. Among the methodologies reviewed were Adams (1991) with limited samples; Olowa and Shittu (2012) that adopted purely monetary approach in analyzing remittances impact on poverty only in the rural areas; Chukwuone et al. (2012), a study that was shrouded with vague explanation of the applicability of the propensity score matching technique coupled with out-dated data; Ajayi et al. (2009) that neglected the household but considered remittances impact across several countries at the macro-level; Rukhsana and Shahbaz (2008), a study that made use of the fully modified ordinary least square technique which cannot be applied for fairly small sample, amongst others. Given the limitations of these studies, this paper adopts an approach similar to Mukherjee and Benson (2003) and it is based on modeling the natural logarithm of total per capita consumption of households which represents household welfare. The ordinary least square estimate of the model will provide average systematic relationship between household welfare and the determinants of poverty. The model enabled multivariate analysis needed to analyse the intricate relationship between the explanatory variables and poverty. Poverty is a multi-faceted phenomenon with several causes, and it is important to include the relevant characteristics fundamental to the welfare of households. The model explains how specific households, community and regional characteristics affect poverty status, conditional on the level of other households' characteristics also serving as potential determinants of poverty, by estimating the households' probabilities of being



poor. While there exist various methods to predict household poverty status, these two approaches have been widely used and they have been proven to be more efficient (Vu and Baulch, 2011).

### 3.3 Review of Empirical Studies

Several studies had shown that remittance receiving households were better than non-receiving households in terms of higher average income and assets base (Sander 2003; Rajan and Subramanian 2005). Other studies that found strong positive influence of remittance income on household poverty and inequality were Ajayi, *et al.* (2009), Odozia *et al.*, (2010), Babatunde and Martinetti, (2010), and Olowa and Shittu (2012).

Castles and Kosack (1973) argued that emigration will create a petty elite whose standard of living will adversely affect the already meager resources supply of the poorest segment of the population. Castles and Kosack (1973) and Paine (1974) argued that savings acquired abroad and sent to home country as remittances were mostly spent on luxury items-expensive property and housing. That is, the investment pattern necessary for remitted earnings to play potential role for increased production had not been realized. Besides, Milanovic (1987) showed that in Yugoslavia, remittances raised inequality, given that the poor did not benefit from migration whereas the richer households were able to access migration opportunities. More recently, it was found that migration pattern in Eastern European and Former Soviet Union countries were such that richer households received greater remittances than poorer households (World Bank, 2006). Viet (2008) discovered that the impact of remittances on poverty reduction was rather small in Vietnam. Chami and Jahjah (2005) stated that increased remittance inflow had negative effects on the marginal propensity to save and invest which arose from moral hazards.

Generally, it was controversial whether remittances had an overall positive or negative welfare impacts on households (Page and Plaza, 2005). The overwhelming results from empirical studies showed that apart from possible increase in social inequality, remittances made significant contribution in reducing poverty or vulnerability in the majority of households and communities (Chimhowu and Pinder, 2003). Adams (1998), Adams and Page (2003, 2005) found a neutral effect on poverty and income inequality in Pakistan and some LDCs. In Zimbabwe, households with migrants had less cultivated land but were slightly better educated (de Hann, 2000).

## 4. Methodology of the study

In order to achieve the objectives of this study, different methodological approaches are used. The methodologies are employed in terms of their suitability for the different objectives

### 4.1 The impact of remittances on households' poverty

The specification of the model for analyzing the impact of remittances on household poverty is similar to that of Mukherjee and Benson (2003) and it is based on modeling the natural logarithm of total per capita consumption of households, which serves as the household poverty indicator, against a set of exogenous determinants such as household and community characteristics. Thus, we have

$$\ln C_j = \beta x_j + \mu_j \quad (4.1)$$

Where,  $C_j$ , the dependent variable, is the mean per capita consumption of household  $j$ ;  $X_j$  is the set of exogenous determinants (independent variables); and  $\mu_j$  is a random error term.

For robustness checks, a probit regression is also estimated with the probability of a household being in poverty as the dependent variable and the identical set of independent variables used in the OLS regression. Households with consumption expenditure above the poverty threshold are considered as

non-poor and those below it are categorized as poor. In this case the dependent variable is a dummy defined as:

$$pov = [1 \text{ if the household is below poverty line, } 0 \text{ if otherwise}] \quad (4.2)$$

$$Pr (pov = 1/X) = F (X, \beta) \quad (4.2i)$$

$$Pr (pov = 0/X) = 1 - F (X, \beta) \quad (4.2ii)$$

where  $X$  is the vector of the household, community and regional level characteristics.  $\beta$  is the set of parameters reflecting the impact of changes in  $X$  on the probability. This approach assesses the determinants of poverty by estimating the households' probability of being poor. While there exist various methods to predict household poverty status, these two approaches (OLS and Probit regression) have been widely used in the literature and have been shown to be more efficient (Vu and Baulch, 2011).

#### 4.2 Profile Remittance flow and Poverty Distribution across Rural areas, Urban areas and the Geopolitical zones of Nigeria

These objectives are accomplished in the background of the study.

#### 4.3 Estimation Technique

The study adopts OLS regression technique in its estimation. The probit regression is also used for robustness check of the OLS estimates. Remittance is a major determinant of household income, consumption and investment. However, there are several factors that could affect remittances meaning that it is an endogenous variable. Consequently, the use of the OLS technique alone leads to endogeneity problem that can affect the reliability of estimated results. The instrumental variable is introduced to correct endogeneity problem associated with similar research.

$$\text{The original model of this study is given as } PCI = \alpha + \beta \sum X_{ij} + \mu_i \quad (4.3)$$

Where  $PCI$  is per capita expenditure of the household;  $X_{ij}$  are vectors of household and community characteristics including remittance income while  $\mu_i$  is stochastic term.

In most studies, in the process of evaluating the impacts of remittances, the problem of endogeneity is not solved. Endogeneity occurs when the explanatory variables and error term are correlated, thus negating one of the assumptions of the ordinary least square technique. Given the sample of the HNLSS (2009/2010), external influences like household income situation (stability or otherwise) and total non-food consumption expenditure not included in the original per capita expenditure equation (equation 4.3) may affect what is recorded as remittance influence on poverty, thus making remittance variable endogenous. To extricate this effect, the study adopts the Heckman (1979) first and second stage equation models. In the first stage, the endogenous variable (remittance income) is regressed against the instrument as

$$Re m_i = \alpha + Z_1 \phi_1 + Z_2 \phi_2 + \mu_i \quad (4.4)$$

Where  $Z_1$  and  $Z_2$  are the instruments and  $\phi_1$  and  $\phi_2$  represents the stability or non-stability (household income situation) of household income and the total non-food consumption expenditures of households respectively.

The predicted value of remittance income ( $Rem_i$ ) is then substituted into the second stage equation of Heckman viz

$$PCI = \alpha + \beta_1 Re m_i + \beta_{ij} \sum X_{ij} + \varepsilon_i \quad (4.5)$$

#### 4.4 Variable Measurement, Estimating Procedures and Data

##### 4.4.1 Variable Measurement

The per capita consumption expenditures (PCE) of the households are compared with the absolute poverty line which is a composition of the food and non-food consumption expenditures of the

households and the base line is N56, 992.77. This base line is obtained by adding the cost of basic needs approach which sets the nutritional threshold to reflect the minimal need of a healthy life and the non-food list as well as its expenditure that produce the non-food line. All households whose PCE falls below this benchmark are considered to be poor while those whose per capita expenditures rise above it are non-poor. However, this study is concerned with the former group that are poor and the mean of this variable constitute the dependent variable. The independent variables include vectors of households, community and regional level characteristics among which are households' income- $X_1$ , remittance income- $X_2$  (cash remittance, food remittance and other remittances), the marital status of households' heads- $X_3$  (married and un-married groups), the number of social affiliations or professional bodies that the households belong- $X_4$  (which consists of low grouping comprising of households' membership to 1 to 3 associations ; mild groupings that is inclusive of households that are members to 4 to 6 affiliations; and the high group case that embodies households that are affiliated to 7 associations and above). The variable  $X_5$  represents the health status of the households' heads. If the heads of households have zero expenditure on health, they are considered to be vulnerable and not maintaining clean bill of health, but they are healthy if otherwise. The explanatory variable,  $X_6$ , is the educational attainments of households' heads and this is reclassified into heads that are illiterates or have no formal vocation, those with primary education, secondary education and tertiary education. The variable  $X_7$  is the size of the households and it could be low when the households have 1 to 3 members, medium when the number of members in the households is between 4 to 6 and large when the households have 7 to 10 members. Generally, the dependent and independent variables are categorized into rural areas, urban areas and the six geopolitical zones that constitute Nigeria.

#### 4.4.2 Estimating Procedures

The Ordinary Least Squares (OLS) is used to estimate the mean of the per capita expenditures of households that are considered to be poor against vectors of households, community and regional level characteristics which have the potential of affecting poverty in equation (7). This is done across rural areas, urban areas and in the geo-political zones of Nigeria to achieve the first objective of this study which is to investigate the impact of aggregate, cash, food and other remittances on households' poverty across these areas and zones. The non-poor households are excluded from the dependent variable. To validate or disprove the OLS outcome, the probit regression is utilized as a robustness check of the former estimate. Probit estimates the probability of the households being poor given identical sets of explanatory variables used in the OLS regression. However, in the case of probit, the technique considers households whose per capita consumption expenditures are above or below the absolute poverty line. Thus, it considers both poor and non-poor households. This can be seen from equations 4.8, 4.8i and 4.8ii. To extricate the effect of endogeneity on the model, the Heckman two-stage equation is used. Correlation analysis as well as the instrumental variable test proved that the households' income situation (S902) and the total non-food consumption expenditures of households (nfdtexp) are not weak instruments in endogenously affecting cash and food remittances respectively. Both instruments have F-Robustness statistics which are more than the benchmark of 10 and a non-zero correlation estimates, both of which indicate that the two variables under consideration (S902 and nfdtexp) are very fundamental in causing endogeneity of cash remittance and food remittance respectively (see appendix 1 behind the references).

#### 4.4.3 Data

The data was obtained from the HNLSS of 2009/2010. The questionnaires cover indicators like demography, education, health, employment, migration, housing, social capital, income transfers, household income schedules and others. The survey covered all the 36 states of Nigeria and the federal

capital territory (FCT). The HNLSS was designed to investigate both urban and rural areas of all the 774 Local Government Areas (LGAs) in Nigeria.

## 5 Result and discussion

### 5.1 The Impacts of Aggregate Remittances on Households Poverty

A percentage change in remittances received by household decreased poverty by 2.4% in the rural areas and 1.3% in the urban areas. This means that households in the rural areas made judicious use of remittances than their counterparts in the urban areas. The impact of remittances in reducing poverty was more pronounced in the North Central, South East and South West zones than in other geo-political zones as indicated by the coefficient estimates of 5.7%, 3.9% and 1.2% respectively.

There was a significant and positive change in poverty among male-headed households in the urban areas than those in the rural areas. This implied that the standard of livings of households with male-heads declined in the urban areas than in the rural areas. With the exception of the North Central zone where poverty was noted to be increasing at a remarkable level across remittance-receiving households in this group, there was no significant change in households' standard of livings in other geo-political zones. Also, the findings indicated that there was a significant rise in households' standard of living (-32.3%) of female-headed households than their male counterparts in the South East. Usually, females are more educated than males in this zone.

The level of households' poverty across married couples was significantly positive (11.3%) in the rural areas and significantly negative (-14.5%) in the urban areas. This could be ascribed to the argument that couples were exposed to different sources of income in the urban areas than in the rural areas. In the urban areas, such couples stood greater chances of expanding the streams of income available to the households which had the potential of increasing their standard of livings. It was observed that poverty was plummeting significantly among households headed by couples in the South West. The reason was not far-fetched. Most households' heads in this zone had higher level of education and earned higher income than those from other geo-political zones.

Households' standard of livings improved tremendously where the heads were in the active age bracket (15-60 years) in both the rural and urban areas. Precisely, the extent of decline was more in the urban areas at -8.2% than in the rural areas (-4.9%). This trend was replicated in the South East and South West zones while it was not significant in other geo-political zones.

Across all strata of education of the households' heads, poverty was conspicuous in the rural areas than in the urban areas. In the geo-political zones, there was remarkable decline in households' poverty when the heads had tertiary education. While poverty was decreasing among the unskilled group (heads) in the North Central, North East and South West zones, it soared significantly in the South-South zones.

Except for households whose members were more than six, there was a significant fall in households' poverty in the rural areas (-49.6%), urban areas (-24.2%) and in the geo-political zones (North Central -61.2%, North East -106%, North West -52.1%, South East -22.7%, South South -47.4% and South West -32.3%).

#### 5.1.2 Cash Remittance

A one percent change in cash remittance led to a significant decline in households' poverty of 2.8% in rural areas and 1.3% in urban areas. In other words, cash remittance made significant impacts in reducing the poverty of households in rural areas than it did in urban areas. Most households judiciously utilized cash remittance in the rural areas than those in urban areas. This trend was obvious in the North Central, South East and South West zones than in other geo-political zones (North East, North West and

South South). This was premised on the argument that there was relative peace in most of the former zones than in the latter zones.

There was no significant variation in households' poverty in male-headed households in the rural and urban areas, however there was in households headed by females in urban areas at 1% level of significance. Poverty plummeted by 6.4% in female-headed households in urban areas and it was inconsequential in the rural areas and in the geo-political zones of Nigeria. This insinuated that females were more economically active than their male folks in the urban areas relative to their counterparts in the rural areas and in the geo-political zones of the country.

In the rural areas, there was growth (11.4%) in households' poverty when the heads were couples than it was in the urban areas. In the geo-political zones, the standard of living of households improved tremendously in this set of households in the South West alone. Here, most households' heads had the potential to earn higher income because of their higher level of education relative to those in other zones.

The level of poverty in households in the active age bracket (15-60 years) was significantly negative in the urban areas at 7.9% and in the South West zone at 7.6% than when the heads of such households were inactive. This finding was in consonance with the debate that households' heads that were within the working population could improve the standard of livings of their members because they were still strong and agile than when they were in-actives.

The level of poverty in households increased by 10.84% when the heads had completed primary education in the urban areas, but it declined by 10.83% in households when the heads were graduates in the rural areas. Heads with other levels of education did not attract significant variation in the poverty levels of members of such households in the rural and urban areas. The fall in the level of poverty where the households' heads had tertiary education in the rural and urban areas was in agreement with the debate that the higher the level of education of households' heads, the lower would be their level of poverty relative to less educated ones. This trend in the tertiary group was replicated in the North Central at -23.31% and in the secondary school category in the North West (-28.7%) and South East (-19.0%) zones.

When the size of the household was small (1-3 members), the level of vulnerability of such households was dwindling than when it was large (above 3 members) in rural and urban areas and in the geo-political zones.

### 5.1.3 Food Remittance

A unit change in food remittance significantly increased poverty in households in the South East by 61.3%. This suggested that food remittance was sparingly sent to households' members in the South East. The impact of food remittance was not significant on households' poverty in both the rural and urban areas of Nigeria. The quantities of food remittance supplied by migrants were disproportionately low compared to cash remittance. Secondly, the receipts might not be put into efficient use due to inefficient value chain that hindered its utilization. In male-headed households, level of poverty was increasing significantly at 24.4% in the urban areas and 81.3% in the South West zone whilst it decreased significantly at -428% in the South East zone. Households' poverty was, however, declining at -17.1% in the rural areas. There was high level of involuntary unemployment among adult males in the urban areas relative to the rural areas. The main occupation practiced by households in the rural areas was farming and it employed more than 70% of the labour force in Nigeria (CBN, 2016). This was partly responsible for the prevalence of improved standard of living in the rural areas.

When the heads of the households were married, households' poverty fell by 3.6% in the rural areas, 32.0% in the urban areas and increased by 101% in the South East. This increasing trend in households' poverty was also seen across un-married households' heads in the South South (37.6%) and South West (73.8%). The level of vulnerability of households was significantly reduced when households'



heads were in the active age group in urban areas (-18.7%) and in the South West (-19.2%) than when they were in-actives. In contrast, households' heads that were in-actives earmarked a significant fall in their poverty level in the South East. There was preponderance of family support schemes to households whose heads were in-actives than when they were active in the South East relative to other geo-political zones.

The estimates also showed that households' poverty was decreasing significantly when the households' heads were graduates (-25%) than when they were less educated in rural areas (illiterates: -13%; secondary school certificate: -6.9%). In urban areas, the statistics showed that heads that were illiterates recorded a reduction in their poverty by 43.8% relative to an increase in households' poverty of 44.8% when the heads had completed primary education. This statistic suggested that there was a high proportion of involuntary unemployment among the educated group of the labour force relative to the unskilled in the urban areas. In the geo-political zones, households' poverty was observed to be decreasing in all the educational levels except in the North West and South West (when the heads had completed secondary education) and in the South South (in the tertiary category).

There was significant decline in households' poverty when the size of the household was small than when it was large. This was evident as households' poverty declined by 54.8% in households of 1 to 3 members in comparison to 19.2% decline in households of 4 to 6 members in the rural areas, 17.0% reduction in poverty in the former group of households (1-3 members) relative to an increase of 35.3% in households in the latter set (4-6 members) in urban areas and similar trend was seen in the South South zone.

#### 5.1.4 Other Remittances

A unit change in other remittances did not make significant contribution to households' poverty in rural and urban areas. The impact was significantly negative at 18.6% in the North West and significantly positive at 4.1% in the South South at 1% and 10% level of significance respectively. Other remittances had inconsequential impacts on households' poverty in both the rural and urban areas; it decreased households' poverty in the North West and aggravated it in the South-South. The gender estimate did not show any significant improvement in the standard of livings of households headed by males in the rural and urban areas, but it did (although less significantly) in the case of households headed by females in the rural areas. In male-headed households in the geo-political zones, households' exposure to poverty was going north-ward in the North West and South South zones.

Also, the marital variable was very fundamental in determining the level of significance of households to vulnerability. Although this did not occur across households whose heads were couples in the rural and urban areas, it did in the case of the un-married ones in the South-South where it escalated poverty by 38.4%. The age group of households' heads was also important in the determination of households' poverty. In households where the heads were active (15-60 years), there was significant reduction in households' poverty in the rural and urban areas than when the households' heads were in-actives. Intuitively, households' heads that were active could make more income than their counterparts in the in-active (above 60 years) age category, given the physical and psychological state of both groups.

The level of poverty among other remittance recipients was significant and increasing when the households' heads were less educated than when they did in the rural and urban areas of Nigeria. For instance, when the households' heads had completed primary education, the level of poverty in such households increased by 56.5% in the rural areas and 85.3% in the urban areas. However, when the heads of households attained higher levels of educational attainment like that of secondary education, the deviation of the household's income below the poverty line falls from 56.5% to 17.9% in the rural areas while the estimates in the urban areas fell from 85.3% to 28.8% below the poverty line. This means that the



higher the level of education of other remittances' recipients, the lower will be the poverty level of the concern and vice versa.

The level of exposure of households to poverty when the size of the households was small (1-3 members) was significantly decreasing by -66.6% in rural areas and -54.1% in the South South than the non-significant outcome that was earmarked when the size of the household was large (above 3 members) in the rural and urban areas and in the geo-political zones of Nigeria.

## 5.2 Probit Regression

The probit estimates were carried out to verify the robustness of the OLS estimates on the impact of remittances on households' poverty. In the rural areas, the probit estimates indicated that there was greater probability of poverty to increase in poor households relative to the non-poor ones. The situation was worst in the urban areas as there was greater probability of the prevalence of poverty in remittance-receiving households that were poor compared to their counterparts that were non-poor. It can be inferred from this statistic that poverty thrived more among poor households that received remittances in the urban areas than it did in the rural areas. This trend was replicated in the geo-political zones with the exception of the North West where there was a fall in the probability of getting more poverty among poor households. Alternatively, there was an increase in the probability of households getting out of poverty or becoming non-poor in the North West.

## 5.5 Instrumental Regression<sup>1</sup>

From the instrumental variable regression, a one per cent rise in cash remittance significantly reduced poverty in households by 9.4% as against 2.56% (in appendix 2) when cash remittance was not extricated from the influence of endogenous variable. Intuitively, the first estimates indicated that cash remittance reduced poverty by 9.4% while the second result stated that the reduction in poverty as a result of cash remittance was very much lower by 2.56%. In other words, in the absence of instrumental regression to purge the model from endogeneity, the impact of cash remittance on households' poverty was smaller than what it should be at 9.4%. The estimated coefficients of cash remittance were below the 5% level of significance meaning that it fell in the acceptance region and validated the hypothesis that cash remittance had significant impacts on households' poverty. Also, the 95% confidence interval estimates were significantly different from zero.

It can also be seen that when the influence of the total non-food consumption expenditure of the household (*nfdtexp*) was extricated from food remittance, the latter had a significant and negative impacts on households' poverty as against its non-significant impact when *nfdtexp* lurked in the food remittance (*nfdremfd*) variable. Specifically, a marginal change in food remittance from migrants reduced households' poverty by 33.3% in comparison to its white noise or inconsequential impact (0.002 from appendix 3) when there was the underlying influence of endogeneity.

## Recommendations

Aggregate remittances reduce poverty in the rural than in the urban areas. Since poverty is higher in the rural area compared to urban, coupled with the fact that remittances reduce poverty in rural areas than in the urban, this shows that the more remittances flow to the rural areas, the higher the tendency of rapid decline in rural poverty. Furthermore, more formal institutions that are involved in the transfer of remittances (i.e., money transfer agencies) should be established in the rural areas to promote their flows

<sup>1</sup> Endogeneity test is applied only to cash and food remittances because their sample size is relatively sufficient compared to that of other remittances. The test is not carried out on aggregate remittances since other remittances (due to insufficient sample size) have been excluded from the aggregate flow.

and documentation in these areas. In the geo-political zones, especially in places where remittances have insignificant impacts on poverty like in the North East, North West and South-South zones, migrants from these extractions need to be re-integrated into their home communities by becoming deeply involved in providing for their left-behind households.

From the findings of this study, food remittance does not reduce households' poverty in the rural and urban areas as well as in the geo-political zones of Nigeria but in the North West. This suggests that food remittance is either insufficiently transferred by migrants to the rural and urban areas and in all the geo-political zones (with the exception of the North West) or there are impediments suffered by food remittance-recipients in processing and storing this receipt in these areas. The government and the private sector should fill the vacuum of inadequate preservation of food transfer among recipient households by providing effective storage facilities for them such that the transfer can be preserved over a longer period. Besides, more industries that are involved in the processing of primary receipts into finished items should be established in the rural and urban areas as well as in the geo-political zones of Nigeria.

The scope of the households' survey should be expanded to include more of other remittances' recipients to decipher the impact of other remittances on households' poverty, consumption and investment in the rural, urban and in the geo-political zones of Nigeria.

### Conclusion

Findings from this study are unique compared to similar studies on remittance and poverty in Nigeria. Studies like Osili (2007), Olowa and Shittu (2012) and Chukwuone *et al* (2012) made unequivocal statement on remittance's impact on poverty reduction. This study unbundles the impacts of cash, food and other remittances on households' poverty in the rural areas, urban areas and in the geo-political zones of Nigeria. Based on the method of estimation adopted, a particular form of remittances could wield significant impact on poverty at a given period whereas the effect may be reversed in some other instances. This could be seen when one compares the estimates of the ordinary least squares and probit. While the former found that remittances reduce poverty in the rural and urban areas and in some of the geo-political zones, the latter estimation technique invalidates these results.

Specifically, cash remittance has greater impacts on poverty reduction in rural areas than urban areas as well as in the geo-political zones especially the North Central, South East and South West zones. However, food remittance does not have significant impact on households' poverty in the rural and urban areas and in the geo-political zones apart from the South East. These results are remarkable improvements on the study of Olowa and Shittu (2012) that considered the impacts of remittances on households' poverty in the rural areas alone. From the comparative analysis embarked on this study, households that receive remittances in the rural areas have higher standard of livings than their counterparts in the urban areas.

Another novelty introduced in this study is the unbundling of the impacts of cash, food and other remittances on households' poverty. While cash remittance has significant impacts on households' poverty in rural and urban areas and in the geo-political zones of Nigeria, food and other remittances do not have significant impact on the level of poverty in households in the rural and urban areas and in most of the geo-political zones of Nigeria.

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### Appendix 1

Correlation between Cash Remittances and S902 (Stability and Non-Stability of Household Income)

Cash\_R~1      S902

Cash Remittance (nfdremcs)	1.0000
S902	0.0331    1.0000

Source: Computed from Stata  
First-Stage Regression Summary Statistics

Variable	R-Square	Adj. R <sup>2</sup>	Partial R <sup>2</sup>	Robust F (1, 2409)	Prob. >F
Cash_Rem_d~1	0.0045	0.0043	0.0016	65.8432	0.0000

Source: Computed from Stata  
Correlation between Food Remittance (nfdremfd) and Total Household Non-Food Consumption Expenditure (nfdtexp)

Food Rem~1      nfdtexp

Food Remittance (nfdremfd)	1.0000
Nfdtexp	0.0002      1.0000

Source: computed from Stata  
First-Stage Regression Summary Statistics

Variable	R-Square	Adj. R <sup>2</sup>	Partial R <sup>2</sup>	Robust F (1, 2409)	Prob. >F
Food_Rem_d~1	0.0031	0.0029	0.0000	11.7611	0.0006

Source: computed from Stata

### Appendix 2

The Impact of Remittances on Households Poverty

Poverty	Estimated Coefficient
Remittance	-0.0257 (-6.70) ***
Male-headed households	0.0430 (2.15) **
Female-headed household	
Married	0.0003 (0.01)
Un-married	

Active	-0.04 (-1.97) **
In-active	
No formal education. /vocation	0.05 (2.15) **
Primary Education	0.1164 (5.58) ***
Secondary Educ.	0.0348 (1.90) *
Tertiary Education	
Households with 1-3 members	-0.2599 (-14.71) ***
Households of 7 members & above	0.2093 (7.75) ***
Few Affiliations	
Large Affiliations	
Healthy	
Unhealthy	0.1001 (6.86) ***
R <sup>2</sup>	23.1%
Observation	2431

Source: Author's computation using Stata

### Appendix 3

#### The Impact of Remittances on Households Poverty

Poverty	Estimated Coefficient
Food Remittance	-0.0021
Male-headed households	0.1913***
Female-headed household	
Married	-0.3288***
Un-married	
Active	-0.0701
In-active	
No formal education. /vocation	
Primary Education	0.2753***
Secondary Educ.	0.1192
Tertiary Education	0.0350
Households with 1-3 members	-0.3585***
Households of 7 members & above	
Few Affiliations	0.0728
Large Affiliations	
Healthy	-0.1607***
Unhealthy	
R <sup>2</sup>	30.8%
Observation	275

Source: Author's computation using Stata

## Appendix 4

## The Impacts of Aggregate Remittances on Households Poverty

Poverty	Rural	Urban	North Central	North East	North West	South East	South South	South West
Remittance	-0.0236 (-4.45) ***	-0.0126 (-2.78) ***	-0.0571 (-6.96) ***	0.0388 (1.61)	-0.0088 (-0.34)	-0.0394 (-4.56) ***	0.0012 (0.20)	-0.0123 (-1.80) *
Male-headed households	0.0035 (0.11)	0.0693 (2.93) ***	0.1372 (3.05) ***	-0.0525 (-0.32)	0.4445 (1.03)		-0.0437 (-1.14)	0.0167 (0.54)
Female-headed household						-0.3227 (-6.48) ***		
Married	0.1125 (3.70) ***	-0.1445 (-5.86) ***	-0.0241 (-0.55)	0.1189 (0.32)	-0.3431 (-0.67)	0.0200 (0.46)	0.0267 (0.64)	-0.0797 (-2.70) ***
Un-married								
Active	-0.0493 (-1.89) *	-0.0819 (-3.60) ***	0.0086 (0.21)			-0.0859 (-2.06) **		-0.0762 (-2.70) ***
In-active				-0.0740 (-0.42)	0.3182 (2.86) ***		0.0640 (1.72) *	
No formal education. /vocative	0.0993 (2.96) ***		-0.2171 (-4.61) ***	-0.3869 (-2.06) **			0.0818 (2.02) **	-0.0124 (-0.33)
Primary Education	0.1467 (4.87) ***	0.1110 (3.67) ***		0.5648 (1.95) *	0.3100 (2.16) **	-0.0062 (-0.11)	0.0705 (1.96) *	
Secondary Educ.	0.1074 (3.98) ***	-0.0026 (-0.10)	-0.1128 (-2.82) ***	-0.1963 (-1.15)	-0.1687 (-1.30)	-0.2797 (-4.67) ***	0.0368 (1.13)	0.0347 (0.99)
Tertiary Education		-0.0149 (-0.54)	-0.2342 (-5.69) ***		-0.0694 (-0.43)	-0.1061 (-1.38)		-0.0476 (-1.35)
Households with 1-3 members	-0.4958 (-14.71) ***	-0.2416 (-10.71) ***	-0.6107 (-11.49) ***	-1.0601 (-5.56) ***	-0.5208 (-4.26) ***	-0.2274 (-4.95) ***	-0.4736 (-11.94) ***	-0.3232 (-5.29) ***
Households with 4-6 members	-0.1659 (-4.64) ***		-0.2783 (-4.81) ***		-0.1135 (-1.13)		-0.1634 (-3.88) ***	-0.1497 (-2.33) **
Households of 7 members & above		0.1251 (3.34) ***		-0.0249 (-0.18)		0.0437 (0.52)		
Healthy	-0.1093 (-5.26) ***	-0.1414 (-7.62) ***	-0.1430 (-4.90) ***	-0.7152 (-4.00) ***	-0.1797 (-1.80) *	-0.02695 (-0.75)	-0.1181 (-4.37) ***	-0.1209 (-4.94) ***
Unhealthy							23.9%	
R <sup>2</sup>	28.2%	19.8%	39.6%	68.5%	35.9%	38.7%	23.9%	11.5%
Observation	1335	1385	603	50	111	328	770	858

Source: Author's computation using Stata

Notes: Absolute value of robust t or z statistics in parenthesis. \*, \*\* and \*\*\* represent 10%, 5% and 1% statistically significant levels respectively



**Appendix 5**

The Impact of Cash Remittances on Households poverty in the Rural and Urban areas and in the Geo-political zones

Poverty	Rural	Urban	North Central	North East	North West	South East	South South	South West
Cash Remittance	-0.0283 (-5.03) ***	-0.0133 (-2.81) ***	-0.0589 (-7.07) ***	0.0377 (1.55)	0.0048 (0.17)	-0.0439 (-4.62) ***	0.0009 (0.14)	-0.0140 (-2.00) **
Male-headed households	0.0294 (0.95)		0.1341 (2.99) ***	-0.0533 (-0.33)		0.3295 (6.44) ***	-0.0256 (-0.63)	0.0169 (0.55)
Female-headed household		-0.0638 (-2.62) ***			-0.3857 (-0.92)			
Married	0.1142 (3.75) ***	-0.1496 (-5.98) ***	-0.0236 (0.54)	0.1205 (0.32)		0.0243 (0.54)		-0.0802 (-2.72) ***
Un-married							-0.0512 (-1.20)	
Active	-0.0159 (-0.59)	-0.0791 (-3.47) ***	0.0072 (0.18)		0.0395 (0.28)	-0.0401 (-0.91)	-0.0545 (-1.43)	-0.0764 (-2.71) ***
In-active				-0.0753 (-0.43)				
No formal education. /vocative			-0.2207 (-4.70) ***	-0.3781 (-2.03) **	-0.1029 (-0.62)	0.1243 (1.48)	0.0957 (2.34) **	-0.0105 (-0.28)
Primary Education	0.0331 (1.09)	0.1084 (3.53) ***		0.5783 (2.00) *	0.1934 (1.21)	0.1231 (1.60)	0.0477 (1.29)	
Secondary Educ.	-0.0177 (-0.59)	-0.0077 (-0.29)	-0.1120 (-2.81) ***	-0.1928 (-1.13)	-0.2866 (-2.34) **	-0.1896 (-2.45) **	0.0336 (1.01)	0.0310 (0.88)
Tertiary Education	-0.1083 (-3.19) ***	-0.0209 (-0.76)	-0.2331 (-5.69) ***					-0.0482 (-1.37)
Households with 1-3 members	-0.4835 (-14.16) ***	-0.2362 (-10.41) ***	-0.6113 (-11.55) ***	-1.0664 (-5.51) ***	-0.6190 (-4.68) ***	-0.2414 (-3.02) ***	-0.4744 (-12.00) ***	-0.3221 (-5.27) ***
Households with 4-6 members	-0.1912 (-5.27) ***		-0.2839 (-4.92) ***		-0.1576 (-1.46)	-0.0432 (-0.50)	-0.1884 (-4.48) ***	-0.1552 (-2.41) **
Households of 7 members & above		0.1154 (3.05) ***		-0.0318 (-0.23)				
Large Affiliations			-0.1477 (-5.07) ***					
Healthy	-0.0863 (10.18) ***	-0.1411 (-7.50) ***		-0.7187	0.0223 (0.20)	-0.0114 (-0.31)	-0.0990 (-3.62) ***	
Unhealthy								0.1215 (4.96) ***
R <sup>2</sup>	27.9%	19.3%	39.8%	68.3%	34.9%	40.8%	24.8%	11.4%
Observation	1254	1354	602	50	91	303	710	852

Source: Author's computation using Stata

Notes: Absolute value of robust t or z statistics in parenthesis. \*, \*\* and \*\*\* represent 10%, 5% and 1% statistically significant levels respectively.

**Appendix 6**

The Impact of Food Remittances on Households Poverty in the Rural and Urban Areas and in the Geo-Political zones of Nigeria<sup>2</sup>

Poverty	Rural	Urban	South East	South South	South West
Food Remittance	0.0076 (0.48)	0.0097 (0.47)	0.6128 (12.09) ***	0.0200 (0.99)	0.0219 (1.48)
Male-headed households	-0.1706 (-1.27)	0.2443 (2.92) ***	-4.279 (-12.59) ***		0.8131 (7.43) ***
Female-headed household				-0.1504 (-1.26)	
Married	-0.0360 (-0.26)	-0.3202 (3.92) ***	1.0119 (7.94) ***		
Un-married				0.3756(2.73) ***	0.7377 (11.07)
Active	0.0140 (0.16)	-0.1872 (-2.50) **		-0.0224 (-0.24)	-0.1917 (-4.43) ***
In-active			-3.3925 (-11.15) ***		
No formal education. /vocation	-0.1298 (-1.17)	-0.4382 (-2.47) **	-3.3925 (-11.15) ***	-0.0437 (-0.36)	-0.3823 (-3.46) ***
Primary Education		0.4476 (3.44) ***	-3.9316 (12.91) ***		
Secondary Educ.	-0.0692 (-0.69)	0.0195 (0.16)	-1.9739 (-7.38) ***	-0.0314 (-0.29)	0.2161 (3.22) ***
Tertiary Education	-0.2500 (-2.61) *			0.2653 (-2.79) ***	
Households with 1-3 members	-0.5475 (-4.46) ***	-0.1697 (-1.46)	-1.7248 (-8.13) ***	-0.3573 (-4.31) ***	0.6249(-9.86) ***
H/ds with 4-6 members	-0.1916 (-1.52)	0.3526 (2.26) **	-6.1206 (-12.21) ***		
H/ds of 7 members /above			-5.1222 (-9.22) ***		
Few Affiliations				-0.0482	
Healthy	-0.2402 (-3.39) ***		-2.3030 (-16.45) ***		
Unhealthy		0.2876 (2.62) ***		0.2445(2.96) ***	
R <sup>2</sup>	36.9%	42.9%	92.1%	37.3%	95.2%
Observation	136	139	65	116	54

Source: Author's computation using Stata; Notes: Absolute value of robust t or z statistics in parenthesis. \*, \*\* and \*\*\* represent 10%, 5% and 1% statistically significant levels respectively.

**Appendix 7**

The Effect of Other Remittances on Households Poverty in the Rural and Urban Areas and in the Geo-Political zones of Nigeria

Poverty	Rural	Urban	South - South
Other Remittance	0.0100 (0.44)	-0.0287 (-1.20)	0.0408 (1.77) *
Male-headed h/ds		0.2386 (1.12)	0.0443 (0.33)
Female-headed h/ds	-0.0529 (-0.26)		
Married	-0.2969 (-1.32)	0.1127 (0.85)	
Un-married			0.3843 (2.35) **
Active	-0.2976 (-1.97) *	-0.9537 (-3.51) ***	0.0794 (0.35)
No formal educat.		0.7076 (2.59) **	0.0163 (0.10)

Primary Education	0.5648 (2.71) ***	0.8531 (2.62) **	-0.1997 (-1.02)
Secondary Educ.	0.1788 (1.15)	0.2879 (1.50)	0.0527 (0.33)
Tertiary Education	0.2863 (1.73) *		
H/ds with 1-3 members	-0.6658 (-4.88) ***	-0.0233 (-0.14)	-0.5413 (-2.81) ***
H/ds with 4-6 members			-0.1665 (-0.92)
Few Affiliations	-0.2287 (-1.27)	-0.2916	
Healthy	-0.3204 (2.25) **	-0.4440 (-3.06) ***	-0.2939 (-2.15) **
Unhealthy			
R <sup>2</sup>	67.9%	82.1%	50.2%
Observation	53	58	40

Source: Author's computation using Stata

## Appendix 8

Probit Regression on the Impact of Remittances on Households Poverty in the Rural and Urban areas and in the Geo-Political zones of Nigeria

Poverty	Rural	Urban	North Central	North West	South East	South South	South West
Remittance	0.0643 (2.42) **	0.1287 (4.85) ***	0.4556 (6.66) ***	-0.1178 (-0.88)	0.2335 (3.65) ***	0.0091 (0.26)	0.0822 (2.36) **
Male-headed households	-0.3690 (-2.48) **	-0.0212 (-0.12)	-1.4300 (-3.76) ***		-1.6506 (-2.81) ***	0.1325 (0.59)	-0.0069 (-0.04)
Married	0.7937 (5.61) ***	-0.5948 (-2.98) ***	0.1391 (0.50)		-0.1982 (-0.37)	-0.0845 (-0.36)	0.4664 (3.23) ***
Active	0.3711 (3.01) ***	0.2411 (2.02) **	-0.01925 (-0.08)	-0.5849 (-0.37)	0.4754 (1.70) *	0.3318 (1.86) *	0.3076 (2.17) **
No formal education /vocative	-2.5183 (-1.65) *	-0.8357 (-4.50) ***	-0.3814 (-1.26)	1.3189 (0.93)	-1.7458 (-1.93) *	-0.6317 (-2.83) ***	-0.3938 (-2.01) **
Primary Education	-0.7825 (-5.12) ***	-1.0463 (-5.97) ***	-1.8204 (-6.27) ***		-2.0847 (-2.37) **	-0.5842 (-2.82) ***	-0.3879 (-1.85) *
Secondary Educ.	-0.1924 (-1.35)	-0.8776 (-5.17) ***	-1.3077 (-4.66) ***	0.6001 (0.34)	-0.8115 (-0.93)	-0.4338 (-2.12) **	-0.6140 (-3.34) ***
Households with 1-3 members	1.5815 (9.84) ***	1.7623 (12.39) ***	2.5654 (8.81) ***		1.2266 (2.96) ***	1.8743 (10.17) ***	1.4222 (5.47) ***
Households with 4-6 members	0.4645 (2.84) ***	0.5011 (3.67) ***	0.7553 (2.74) ***	-0.1210 (-0.11)	0.03872 (0.09)	0.4905 (2.96) ***	0.6406 (2.46) **
Healthy	0.8255 (6.90) ***	0.5384 (5.23) ***	0.7618 (3.78) ***	2.2537 (208) **	0.5573 (2.00) **	0.5649 (4.03) ***	0.7229 (4.95) ***
Observation	1385	1335	603	24	328	770	858
R <sup>2</sup>	24.1%	29.2%	46.3%	38.2%	45.2%	26.2%	15.3%
LR chi <sup>2</sup>	271.55***	409.93***	283.96***	11.66*	126.46***	187.82* **	106.87***

Source: Author's computation using Stata

Notes: Absolute value of robust t or z statistics in parenthesis. \*, \*\* and \*\*\* represent 10%, 5% and 1% statistically significant levels respectively.

### Appendix 9

Probit Regression on the Impact of Remittances on Households Poverty in the Rural and Urban areas and in the Geo-Political zones of Nigeria

Poverty	Rural	Urban	North Central	North West	South East	South South	South West
Remittance	0.0643 (2.42) **	0.1287 (4.85) ***	0.4556 (6.66) ***	-0.1178 (-0.88)	0.2335 (3.65) ***	0.0091 (0.26)	0.0822 (2.36) **
Male-headed households	-0.3690 (-2.48) **	-0.0212 (-0.12)	-1.4300 (-3.76) ***		-1.6506 (-2.81) ***	0.1325 (0.59)	-0.0069 (-0.04)
Married	0.7937 (5.61) ***	-0.5948 (-2.98) ***	0.1391 (0.50)		-0.1982 (-0.37)	-0.0845 (-0.36)	0.4664 (3.23) ***
Active	0.3711 (3.01) ***	0.2411 (2.02) **	-0.01925 (-0.08)	-0.5849 (-0.37)	0.4754 (1.70) *	0.3318 (1.86) *	0.3076 (2.17) **
No formal education /vocative	-2.5183 (-1.65) *	-0.8357 (-4.50) ***	-0.3814 (-1.26)	1.3189 (0.93)	-1.7458 (-1.93) *	-0.6317 (-2.83) ***	-0.3938 (-2.01) **
Primary Education	-0.7825 (-5.12) ***	-1.0463 (-5.97) ***	-1.8204 (-6.27) ***		-2.0847 (-2.37) **	-0.5842 (-2.82) ***	-0.3879 (-1.85) *
Secondary Educ.	-0.1924 (-1.35)	-0.8776 (-5.17) ***	-1.3077 (-4.66) ***	0.6001 (0.34)	-0.8115 (-0.93)	-0.4338 (-2.12) **	-0.6140 (-3.34) ***
Households with 1-3 members	1.5815 (9.84) ***	1.7623 (12.39) ***	2.5654 (8.81) ***		1.2266 (2.96) ***	1.8743 (10.17) ***	1.4222 (5.47) ***
Households with 4-6 members	0.4645 (2.84) ***	0.5011 (3.67) ***	0.7553 (2.74) ***	-0.1210 (-0.11)	0.03872 (0.09)	0.4905 (2.96) ***	0.6406 (2.46) **
Healthy	0.8255 (6.90) ***	0.5384 (5.23) ***	0.7618 (3.78) ***	2.2537 (208) **	0.5573 (2.00) **	0.5649 (4.03) ***	0.7229 (4.95) ***
Observation	1385	1335	603	24	328	770	858
R <sup>2</sup>	24.1%	29.2%	46.3%	38.2%	45.2%	26.2%	15.3%
LR chi <sup>2</sup>	271.55***	409.93***	283.96***	11.66*	126.46***	187.82***	106.87***

Source: Author's computation using Stata

Notes: Absolute value of robust t or z statistics in parenthesis. \*, \*\* and \*\*\* represent 10%, 5% and 1% statistically significant levels respectively.

**Appendix 10**

## Instrumental Variable Estimates on the Impacts of Cash Remittances on Households Poverty

Poverty	Estimated Coeff.	Standard Error	Z	P>  z	95% Confidence Interval	
Cash Remittance	-0.0940	0.0422	-2.23	0.026	-0.1766	-0.0113
Male	0.0559	0.0215	2.60	0.009	0.0137	0.0981
Female						
Married	-0.0544	0.0275	-1.98	0.048	-0.1084	-0.0004
Un-married						
Active	-0.0535	0.0191	2.81	0.005	-0.0908	-0.0163
In-Active						
No Formal Education	-0.0003	0.0324	-0.01	0.992	-0.0638	0.0632
Secondary Education	0.0067	0.0267	0.25	0.802	-0.0456	0.0589
1-3 Members	-0.4733	0.0273	-17.35	0.000	-0.5268	-0.4199
4-6 Members	-0.2197	0.0300	-7.32	0.000	-0.2785	-0.1609
Healthy	-0.0963	0.0154	-6.26	0.000	-0.1265	-0.0662
Unhealthy						
North Central	0.0224	0.0204	1.10	0.272	-0.0176	0.0623
North East	-0.0975	0.0563	-1.73	0.083	-0.2079	0.0129
North West	-0.1260	0.0673	-1.87	0.061	-0.2579	0.0059
South East	0.0119	0.0259	0.46	0.647	-0.0390	0.0628
South South	-0.0666	0.0221	-3.02	0.003	-0.1099	-0.0234
Urban	-0.0498	0.0148	-3.36	0.001	-0.0789	-0.208
Observation	2602					
R <sup>2</sup>	10.9%					
Wald chi <sup>2</sup>	630.43					

Source: Author's computation using stata

**Appendix 11**

## Instrumental Variable Estimate on the Impact of Food Remittance on Households Poverty

Poverty	Estimated Coefficient	Standard Error	Z	P>  Z	95% Confidence Interval	
Food Remittance	-0.3335	0.1123	-2.97	0.003	-0.5536	-0.1133
Male	0.5726	0.2071	2.76	0.006	0.1667	0.9784
Married	-0.8397	0.2228	-3.77	0.000	-1.2764	-0.4029
Active	-0.4122	0.1550	-2.66	0.008	-0.7161	-0.1084
No Formal Education	-0.2051	0.1821	-1.13	0.260	-0.5620	0.1518
Primary Education	-0.2498	0.2208	-1.13	0.258	-0.6825	0.1829
Secondary Education	-0.0267	0.1292	-0.21	0.836	-0.2800	0.2265
1-3 Members	-0.3763	0.2010	-1.87	0.061	-0.7704	0.0176
4-6 Members	-0.0044	0.2130	-0.02	0.984	-0.4219	0.4132
Healthy	-0.1146	0.1092	-1.05	0.294	-0.3287	0.0995
North Central	0.6489	0.2958	2.19	0.028	0.0691	1.2287
North East	1.1381	0.7275	1.56	0.118	-0.2878	2.5640
North West	-0.3651	0.2938	-1.24	0.214	-0.9409	0.2108

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South East	-0.2504	0.1691	-1.48	0.139	-0.5818	0.0810
South-South	-0.0293	0.1492	-0.20	0.844	-0.3216	0.2631
Urban	0.3188	0.1918	1.66	0.096	-0.0571	0.6946
Observation	275					
R <sup>2</sup>	41.9					
Wald Chi <sup>2</sup>	44.33					

Source: Author's Computation using Stata

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