The impact of remittances on household investment in Nigeria

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Abstract

Remittances are monetary and non-monetary items that migrants send to members of their respective families and communities in their countries of origin. Several studies have argued that remittances rarely fund productive investment while others argued otherwise. Previous studies have focused on the impact of the aggregate remittances on households' investment without considering the roles of the different types of remittances like aggregate, cash, food and other remittances on households' investment in Nigeria. This study was therefore designed to analyse the impact of the various types of remittances on households' investment in the rural areas, urban areas and in the geo-political zones of Nigeria. Data were obtained from the Harmonised Nigerian Living Standard Survey of 2009/2010. The study was premised on the Investment Theory. The Ordinary Least Squares (OLS) technique was used in estimating the model and probit regression was used as robustness check of the OLS estimate. Instrumental variable test was used to verify the existence of endogeneity in the model. The impacts of the aggregate, cash, food and other remittances on households' investments are chequered in the rural areas, urban areas and in the geo-political zones of Nigeria.

1. Introduction

An important body of research in economics examines the multiple roles of migration in households' investments in developing countries (Lucas and Stark (1985), Poirine (1997), Nyamongo et al. (2012), World Bank (2016), amongst others). Remittances are monetary and non-monetary items that migrants send to members of their families and communities in their countries of origin. Remittances are associated with increased households' investments in education, entrepreneurship and health- all of which have social return in most cases. Studies based on households' surveys in El Salvador and Sri Lanka found that children from remittance-receiving households have lower school drop-out ratio and these households spend more on private tuition for their children. In Sri Lanka, children from remittance recipients' households have higher birth weight, an indication that remittances enable households to afford better health care. Many studies found migration and remittances to be positively correlated with various types of households' investments in developing countries. In contrast, other studies argued that resources received from migrants rarely fund productive investment but promote households' consumption expenditures. Large and sustained remittance flow can cause appreciation of the real exchange rate and, thus, crystallizes to a loss in the relative export competitiveness by making the production of cost-sensitive tradables like cash crops and manufacturing less profitable. Although

empirical evidence on the adverse effect of remittances on households' investments is limited, it is laudable that this effect exists, and it is significant in many developing countries.

There is a consensus in most economic literature that migrants who financed the cost of their migration from their personal savings invested more of their earnings than those that borrowed from friends or relatives. The latter group of migrants, quite often than not, are expected to dance to the whims and caprices of their sponsors or creditors. The loans taken by migrants and the economic rent paid by them to recruiting agents are fundamental in their success or failure in directing remittances to investment (Ratha and Plaza, 2016). The prohibitive cost of migration is associated to unlawful recruitment practices. Migrants from poor households managed these costs by borrowing money from their friends and relatives and a colossal part of their out-of-home earnings may have gone to setting-off these debts. It is, thus, a herculean task for migrants from such background to live above board by using remittances productively.

There are at least three views on how remittances are spent and the impacts of the flow on investment: The Classical, Neo-Classical and Developmentalist Theory (i.e Todaro, 1969, Beijer, 1970); The Structuralists, Dependency and Neo-Marxist Theory (i.e Lipton, 1980, Entzinger, 1985, Van Dalen et al., 2005); The Pluralists view (i.e Lucas and Stark, 1985; Lieten and Nieuwenhuys, 1989). The first view is that remittances are spent at the margin on investment like income from any other sources. The second perspective is that the receipts of remittances can cause behavioral changes at the household levels that may lower their investment potentials relative to the receipts of income from other sources. A third and more recent view holds an optimistic stance that remittances actually increase investments in human and physical capital at the margin, relative to other forms of households' income. Choosing among these three distinct views is largely a question of generating a body of careful empirical work based on statistically representative household surveys.

This research is unprecedented as it unbundles the impact of the different types of remittances vis-à-vis aggregate, cash, food and other remittances on households' investments in the rural areas, urban areas and in the geo-political zones of Nigeria. Since problems such as endogeneity, reverse causality and omitted variables underscore the efficacy of remittances' impacts on households' investments, this study adopts probit regression as robustness checks of the ordinary least squares estimate as well as utilize instrumental variable estimate.

The broad objective of the study is to examine the investment potentials of remittances in households. The first specific objective of the research is to examine the patterns and distributions of households' remittances and investments in the rural areas, urban areas and in the geo-political zones of Nigeria. Secondly, the study investigates the impact of remittances on households' investments in the rural areas, urban areas and in the geo-political zones of Nigeria.

2. Background
2.1 Remittance Profiles of Households

It can be inferred from the Table 1 that there are more male-headed households than female-headed households in Nigeria. However, the latter received more food and other remittances flow than the former. In terms of marital status, households in which couples are married received less remittances from migrants relative to unmarried case. Moreover, households whose heads fall within the in-active group (61-95 years) obtains more food and other transfers (except cash remittances) from migrants compared to households headed by active groups (15-60 years).

Table 1. Distribution of Households based on Types of Remittances received across Gender, Marital status and Age groups of Household Heads.

Variables	Male	Female	Total	Married	Unmarried	Total	Active (15-60 yrs.)	Inactive (61-95 yrs.)	Total
Cash 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%)
Food 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%)
Other Remittance -Receiving households	85 (0.14%)	62 (0.44%)	147 (0.19%)	81 (0.13%)	66 (0.45%)	147	102 (69.39%)	45 (30.61%)	147 (0.19%)

Source: Author's computation from HNLSS 2009/10.

The Table 1 shows that 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 is 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, females are known to be better cooks than male and, in most households in Nigeria, activities relating to the kitchen fall under the purview of the females. Thus, they appreciated food remittances more than their male-folks. In the same vein, 0.44% of other remittance flows were given to female-headed households relative to 0.14% that were transferred 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 whose heads fall under the in-active group received 0.63% of food remittances relative to 0.45% obtained by the active ones, 30.61% of other remittances compared to 69.39% 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.

The Table 2 showed that urban households had more cash remittances than rural households. However, rural households received more food and other remittances than those from the urban areas. Furthermore, the southern part of Nigeria received more remittances from migrants than the north. Urban

households 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. People living in the rural areas are very much concerned with subsistence lifestyle and farming unlike urban areas where inhabitants quest for 'white collar' jobs, sophistication and luxurious acquisitions. Households in the rural sector scored 55.8% in their receipts of other remittances from migrants relative to the scores of their counterparts in urban areas-44.2%. 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. Distribution of Households by Sector

Cash Remittance	Remittance-Receiving household
Urban	1,771 (50.5%)
Rural	1,733 (49.5%)
Total	3,504
Food Remittance	
Urban	165 (43.4%)
Rural	215 (56.6%)
Total	380
Other Remittance	
Urban	65 (44.2%)
Rural	82 (55.8%)
Total	147

Source: Author's computation from HNLSS 2009/10.

In the Table 3, a breakdown of remittances received by households in the geographical zones showed that remittance recipients from the South-South region of Nigeria had the largest part 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 Nigeria's migration pattern which was hitherto in favor of this region more than the north. Long history of migration is associated with the prevalence of remittances (Taylor and Mora, 2005). There was a similar trend in the pattern of food remittance and other remittances flows 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 remittance recipients.

Table 3. Distribution of Households by Geo-Political Zones

Geo-Political Zones	North-Central	North-East	North-West	South-East	South-South	South-West	Total
Cash Remittance-Receiving Househd	786 (6.01%)	78 (0.09)	225 (1.74%)	353 (2.97%)	896 (8.46%)	1,166 (6.15%)	3,504 (4.61%)
Food Remittance-Receiving Househd	36 (0.28%)	9 (0.01%)	38 (0.30%)	73 (0.62%)	149 (1.41%)	75 (0.40%)	380 (0.50%)
Another Remittance-Receiving Household	8 (0.06%)	2 (0.02%)	33 (0.25%)	36 (0.30%)	47 (0.44%)	21 (0.11%)	147 (0.19%)

Source: Author's computation from HNLSS 2009/10

2.2 The Investment Patterns of Households

From the Table 4, most households that receive cash remittance invested their earnings. This was seconded by households which received food remittances and the least in the group were other remittances' recipients.

Table 4. The Investment Patterns of Households based on the Types of Remittances Received

Cash Remittance Remittan. -Receiv. H/ds	Investor	Non-Investor	Total
Food Remittance	2,086	1,418	3,504
Remit-Receiv. H/ds Other Remittances	202	178	380
Remit. -Receiv. H/ds	69	78	147

Source: Author's computation from HNLSS (2010)

3. Literature Review

Over time, discussions about the impact of remittances on investments have evolved from largely negative to more positive views. The former is encapsulated by the historical-structuralist perspective and influenced by dependency theory and they argued that migration and remittances create dependent relationships between migrants and non-migrants as well as sending and receiving countries. Remittances also contribute to macro-economic instability in countries with low GDP while migration erodes the human capital of countries in the South, making it harder to foster development. In contrast, more positive pronouncements on the impact of remittances on households' investments which have their roots in 1950s and 1960s ideas about migration as a major engine of development (through the diffusion of ideas, technology, skills and so on) have been more recently given by the New Economics of Labour Migration (NELM) approach in the 1980s and 1990s (Bracking, 2003; Carling, 2004; Stark and Bloom, 1985; Robinson, 2004; Taylor, 1999). This argument, based on a neo-liberalist functionalist perspective, hinges decisions to migrate with the impact of migration and argued that mobility is linked to households survival and the quest to raise income and capital for investment in order to guard against income and production risks (de Haas,2006). In turn, remittances loosen the constraints facing poor households (Taylor, 1999). As such, remittances are seen as being beneficial at a range of scales from the household to the national level as they increase disposable incomes while also stimulating demand for local goods and

services (Ratha, 2003; Skeldon, 2002). Furthermore, they can also lead to the production of local capital markets as well as productive infrastructure (Ballard, 2003). Even more recently, the transnational migration school had sought to bring these divergent perspectives together, building upon the notion of transnational communities (Levitt, 2001) and viewing remittances as one component of the economic and non-economic flows linking sending and receiving countries. Although this perspective was critical of the structures within which migrants remitted and was cognizant of how remittances reinforced and created social inequality and differentiation, it also acknowledged that the transfer had beneficial impacts and could contribute in varying ways to households' investments (Ballard, 2003; Carling, 2004).

At the household and community levels where the effects of remittances are most clearly felt, the debates have tended to focus on whether remittances are used for productive activities (invested in capital generating activities) or unproductive activities (in the consumption of goods and services) (de Haas, 2005). The negative view focused on how remittances were used for unproductive activities and spent on welfare, education, housing and consumption goods which, in turn, had little effect on poverty (Ballard, 2003). However, this perspective has been increasingly challenged. First, although remittances are overwhelmingly spent on immediate living expenses, as well as on consumption goods and services, many recipients also spend them on productive goods in terms of small business development, the purchase of land (Carling, 2004; de Haas, 2006). Second, it is now acknowledged that the difference between productive and unproductive use of remittances has limited value in that improvements in education, health and other dimensions of welfare may have important effects on poverty alleviation and developmental outcomes in the longer term (Carling, 2004; de Haas, 2005; Sorensen, 2004; Van Hear and Sorensen, 2003).

Empirically, Taylor (2006) found that migration and remittances were neither a panacea to economic development nor the opposite. Remittance is an integral part of income growth in all countries and the flow shapes development. It helps households to overcome some of the constraints that they face when there are market failures in the credit and insurance sectors as banks do not lend money to peasant farmers, and micro-insurance for small households is near absent in developing countries. Thus, such households can invest windfalls from migrants in the face of the daunting challenges confronting them. Ratha and Mohapatra (2007) opined that remittances could have positive effect on investments in education, health and the overall rate of growth of the economy. In a good investment environment with well-developed financial systems and sound institutions, higher share of remittances translates to investments in physical and human capital. Furthermore, financial institutions can leverage on their access to remittances to raise capital from international bond markets to finance infrastructure and other development projects. However, the securitization structure does not absolve these financial players of their liabilities to remittance beneficiaries. Also, Etowa (2015) in the effect of remittances on farm households' welfare found that increasing per capita remittances by a unit caused households' welfare to increase by 85.5 units. This implied that the remittance recipients saved or invested only 14 per cent of their remittances and did not spread their consumption (from remittances) over their lifetime. Besides, Cuong (2009) found that international remittances helped recipients to increase savings and production investments whereas internal remittances increased per capita food consumption expenditures and per capita expenditure in health care, education and other food consumption in Vietnam. Dharkal (2012) discovered that households that received remittances spent more on consumption and less on investment goods in Nepal. This finding was similar to Zhu et al (2008) in China.

In the review of methodology, Etowa (2015) obtained data from the General Households Survey (GHS) in 2010/2011 and the Nigeria Living Standard Survey (NLSS) in 2003/2004 by the Nigeria Bureau of Statistics. The analytical tool employed two independent samples student t-tests, poverty profile

function using multiple regression analysis, difference-in-difference estimator within the framework of log-linear multiple regression framework, two stage least square using simultaneous equation model and inequality decomposition using Theil Index analysis. Yang (2006) used data from four linked households' surveys conducted by the National Statistic office of the Phillipines: The labour force survey (LFS), the survey of overseas Filipinos (SOF), family income and expenditure survey (FIES) and the annual poverty indicator survey (APIS). A first difference regression specification was used to represent exchange rate stocks in changes in outcome variables. The OLS regression was also used. Each cell in the estimation included households' location fixed effects and controls for households and migrant characteristics. Gounder (2012) estimated the determinant of household consumption and poverty in Fiji using the Ordinary Least Squares estimator and performed robustness check on the result with the probit regression model. 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).

4. Methodology
4.1 Theoretical Framework

The equilibrium level of income is given by
$$Y = C + I \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

Where Y represents income, C stands for consumption expenditure and I depicts investment spending. The study is concerned with changes in investments induced by changes in income. Economic literature on remittances like Castle and Kosack (1973), Sander (2003), Rajan and Subramanian (2005) unfolded that remittances were used by households for consumption (C) and investments (I). Thus,
$$Y^R = C + I \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

Where Y^R represents remittance income. The investment variable can be utilized for physical undertakings (I_P) and/or business purposes (I_B). Hence,
$$Y^R = C + \sigma(I_p + I_B) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (3)$$

Where σ is the investment parameter. Changes in the flow of remittances may lead to changes in the composition of C and the constituents of investments such that
$$\Delta Y^R = \Delta C + \sigma \Delta (I_P + I_B) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (4)$$

By expanding equation (4), we have equation (5)
$$\Delta Y^R = \Delta C + \sigma \Delta I_p + \sigma \Delta I_B \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (5)$$

In the simple Keynesian model of income determination, changes in investment are considered to be autonomous or independent to changes in income while changes in consumption are dependent on changes in income.
$$C = a + bY \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (6)$$

Where a is the autonomous consumption (whether the households earn income or not, they must consume) and b is the marginal propensity to consume. Therefore, consumption changes when there are alterations in income.
$$\Delta C = a + b\Delta Y \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (7)$$

Since the intercept a is zero, equation (7) becomes
$$\Delta C = b\Delta Y^R \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (8)$$

Substituting equation (8) into equation (5) translates to
$$\Delta Y^R = b\Delta Y^R + \sigma \Delta I_P + \sigma \Delta I_B \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (9)$$

By bringing like terms together, we have

$$\Delta Y^R - b \Delta Y^R = \sigma \Delta I_P + \sigma \Delta I_B \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(9i)}$$

$$\Delta Y^R (1-b) = \sigma \Delta I_P + \sigma \Delta I_B$$

$$\Delta Y^R = \frac{\sigma \Delta I_p + \sigma \Delta I_B}{1-b} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(10)}$$

The implication of this is that alteration in the flow of remittances can bring about manifold changes in the dimension and composition of physical and business investments.

4.2 Empirical Model

The specifications of the model are given below. Equation (1) can be re-stated as

$$Y = C + I$$

Investment is a function of remittance (Y_R) as shown by equation (11)

$$I = f(Y_R) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(11)}$$

According to Campbell and Mankiw (1989), there are other covariates in the households' investments function apart from income. This is expressed in equation (12).

$$I_i = b_0 + b_1 Y_1 + b_2 Y_R + b_3 X_1 + b_4 X_2 + b_5 X_3 + b_6 X_4 + b_7 X_5 + b_8 X_6 + b_9 X_7 + \mu_i .. \text{(12)}$$

Where

I_i is households' investment expenditure (measured by land purchase, vehicle ownership and ownership of buildings), Y_1 is current income of households, Y_R is remittance income of households' heads, the variable X_1 is the gender of the household heads, X_2 is marital status of household heads, X_3 is health status of household heads, X_4 is the households' social affiliations or groups, X_5 is the age group of the household heads, X_6 is the educational attainment of household heads and X_7 is the household size.

The investment model is also classified into rural and urban households as shown in equation (13) and (14) respectively.

$$I_i = b_0 + b_1 Y^R_1 + b_2 Y^R_R + b_3 X^R_1 + b_4 X^R_2 + b_5 X^R_3 + b_6 X^R_4 + b_7 X^R_5 + b_8 X^R_6 + b_9 X^R_7 + \mu_i$$
$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(13)}$$

In equation (13), the superscript R epitomizes rural households. The model specifying urban households is shown as

$$I_i = b_0 + b_1 Y^U_1 + b_2 Y^U_R + b_3 X^U_1 + b_4 X^U_2 + b_5 X^U_3 + b_6 X^U_4 + b_7 X^U_5 + b_8 X^U_6 + b_9 X^U_7 + \mu_i$$
$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(14)}$$

Here, the variable U represents urban households and other parameters are as explained in equation (12).

For robustness check, probit regression is also estimated with the probability of a household making investment as the dependent variable. This is regressed against identical set of explanatory variables used in the OLS regression.

Pr (Investment =1/X) = F (X, β) $\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (15)

Pr (Investment =0/X) = 1 – F (X, β) $\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (16)

Where equation (15) is the probability of the household investing and equation (16) is the probability of the household not investing. The variable X represents the independent variables and β explains the extent to which they affect the dependent variable.

4.3 Estimation Technique

The study adopts regression 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. The original model of this study [I = f (Y)] can be re-stated as

$$Investment = \alpha + \beta_{ij} \sum X_{ij} + \mu_i \qquad \text{.. (17)}$$

Where I am the investment expenditure of the household; X_{ij} are vectors of household and community characteristics including remittance income while μ_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 investment expenditure equation (equation 11) may affect what is recorded as remittance influence on investment, 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

$$\text{Re}\, m_i = \alpha + Z_1 \phi_1 + Z_2 \phi_2 + \mu_i \qquad \text{................................. (18)}$$

Where Z_1 and Z_2 are the coefficients of the parameters to be estimated; the instruments ϕ_1 and ϕ_2 represent 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

$$I = \alpha + \beta_1 \text{Re}\, m_i + \beta_{ij} \sum X_{ij} + \varepsilon_i \qquad \text{.................................. (19)}$$

5. Results and Discussion

The estimates of the specified model and their implications in respect of achieving the underlying objectives of this study are elucidated below.

5.1 Aggregate Remittances

In Table 5, a percent rise in remittances leads to a significantly positive change in households' investment of 14.6% in rural areas and 16.4% in urban areas. Thus, the growth in households' investment as a result of remittances is more in urban areas than in rural areas. This can be attributed to the increased investment opportunities in urban areas than rural areas. In the geo-political zones, a similar change in remittances from migrants generates a significant and positive pattern in households' investments of 46.9% in the North Central, 12.6% in the South West and 12.5% in the South South. In the North West, the relationship between remittances and households' investment is significantly negative at 23.7%. All these insinuate that remittances have direct relationship with households' investment in the North Central, North East, South South and South West whilst the relationship is inversed in the North West. There is a fall in the investment expenditure of households when migrants send more remittances to them in the

North West and South East zones than in other geo-political zones. There is a high prevalence of households below the poverty line in these two geo-political zones (North West and South East) than their counterparts in other geo-political zones. This may contribute to the preponderance of more households struggling to increase their consumption share in a bid to survive in the North West and South South.

In households with male heads, investments in these households grows significantly at 82.1% in the rural areas, 148% in the South East and 61.4% in the South West zones. In the South South, this is significantly negative at 56.6% and at 10% level of significance. It is common to find more male heads that are self-employed in farming in the rural areas and high level of involuntary employment in urban areas. Furthermore, households' investments is significantly high in the South East and South West zones, given the argument that male-heads in the South East are astute in entrepreneurial abilities while those in the South West are more educated and can earn higher income relative to their counterparts in other zones.

When the heads of households are married, the investment share of such households rises significantly and positively by 32.4% in rural areas and 38.8% in urban areas. In other words, the proportion of households' investment among the aggregate remittances' recipients is higher in the urban areas than in the rural areas. It has been shown in the background of this study that there is a high prevalence of poverty in the rural areas than in the urban areas of Nigeria. Besides, it has been argued by several literatures on remittances that poor households consume more and invest less than the non-poor. In the geo-political zones, investment across this set of households is significantly negative at 127% in the South East and significantly positive at 79.4% in the South West. It is common to find larger households as a result of polygamy in the South West than in other geo-political zones in the southern part of Nigeria. It is argued that households with many members have a higher tendency to invest more than households with fewer members. However, investments are significantly negative in households with un-married heads in the North Central zone. Most households across this group may be having fewer migrants due to the relative peace in this zone.

In the case of households' heads in the working population (15-60 years), investments in the respective households are significant and negative at -44.5% in the rural areas and a significantly positive change of 97.3% in the urban areas. The disparity in the level of poverty across households in most rural and urban areas may be a contributive factor to these differences in investments. In households where the heads have secondary education, there is a significantly positive change in investment of 69% in rural areas and 62% in their counterparts with primary education. This is indicative of the fact that highly educated individuals who receive aggregate remittances invest more than those with relatively lower level of education in the rural areas. This trend is also largely replicated in the geo-political zones of Nigeria.

Similarly, the share of investments when the size of the households is large (4-6 members) is significant and negative in the rural areas (-74.7%) and, in the urban areas, (-62.5%) when the size of the households is small (1-3 members). The argument that the larger the size of a household, the greater is its potential of having more farms and investment in the rural areas holds. This is contrary to the prevailing circumstance in most urban areas where the burden of taking care of the households rests on the shoulder of the households' heads alone.

In situations where the heads of households belong to fewer associations or clubs, the investment portfolio of such households is significantly positive at 48.3% in the urban areas and significant and negative (-117%) in the North Central zone. In other words, investments in households increase in the urban areas and plummets in the North Central zone among the recipients of aggregate remittances when the households' heads belong to fewer associations. This suggests that it is not all kinds of associations that households belong to that influence investments in these households.

Table 5. The Impact of Remittances on Households Investment in Rural and Urban Areas and in the Geo-Political zones of Nigeria

Investment	Rural	Urban	North Central	North East	North West	South East	South South	South West
Remittance	0.1457 (3.75) ***	0.1641 (4.68) ***	0.4690 (7.50) ***	0.4805 (-1.78) *	-0.2365 (-2.06) **	-0.1459 (-0.25)	0.1245 (1.78) *	0.1258 (2.25) **
Male-headed households	0.8206 (4.52) ***	-0.1050 (-0.54)		1.3392 (0.61)	1.1045 (0.74)	1.4786 (4.42) ***	-0.5658 (-1.66) *	0.6138 (3.04) ***
Female-headed household			0.1325 (0.50)					
Married	0.3239 (1.74) *	0.3875 (2.02) **			-0.7762 (-0.44)	-1.2758 (-4.73) ***	0.5857 (1.48)	0.7936 (4.17) ***
Un-married			-1.0538 (-3.25) ***	2.7079 (1.56)				
Active	-0.4451 (-2.15) **	0.9734 (5.84) ***	2.0057 (6.34) ***		-1.6402 (-3.78) ***		0.4121 (1.15)	0.4444 (2.16) **
In-active				-1.1692 (-1.29)		-0.3187 (-1.06)		
No formal education. /vocation		-1.3961 (-6.67) ***		-0.5608 (-0.32)		-0.5824 (-0.79)	-0.0788 (-0.20)	-0.7857 (-2.90) ***
Primary Education	0.6186 (2.52) **	-0.8697 (-4.34) ***	0.9496 (3.13) ***		-0.2255 (-0.38)	-1.5252 (-2.09) **		
Secondary Educ.	0.6895 (3.27) ***	-1.0310 (-6.10) ***	0.4796 (1.67) *	2.1587 (1.45)	0.4680 (0.82)	-0.7866 (-1.10)	0.4944 (1.51)	-0.7801 (-2.89) ***
Tertiary Education	0.4018 (1.83) *		1.3160 (4.53) ***		0.6104 (0.87)		1.4543 (4.14) ***	-0.1647 (-0.63)
Households with 1-3 members	-0.2342 (-0.91)	-0.6247 (-3.78) ***	-0.3305 (-1.42)	-2.9065 (-2.13) **		0.9304 (3.25) ***	-0.0091 (-0.03)	0.3584 (1.68) *
Households with 4-6 members	-0.7471 (-2.65) ***			-0.5895 (-0.67)	-0.9120 (-1.51)			
Households of 7 members & above					-0.8090 (-1.36)	1.4898 (3.03) ***		-0.3346 (-0.84)
Few Affiliations		0.4833 (2.06) **	-1.1749 (-3.15) ***				0.0990 (0.24)	
Large Affiliations								
Healthy	-0.2722 (-1.91) *	0.3756 (2.72) ***	0.1161 (0.61)	-0.1343 (-0.13)	-0.1006 (-0.25)		0.5233 (1.90) *	0.1836 (1.09)
Unhealthy						-0.1405 (-0.61)		
R²	8.5%	16.7%	25.7%	64.5%	26.9%	27.6%	16.2%	12.1%
Observation	835	823	400	34	77	234	324	589

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.

5.2 Cash Remittance

In Table 6, if cash remittance is increased by one per cent, this leads to a significant increase in households' investment by 7.3% in the rural areas and 13.1% in the urban areas. Most households in the rural areas are complacent with the need to survive but when they receive cash remittance, this additional resource motivates them to seek for other outlets where to put their means to leverage additional benefits. However, most of such economic opportunities are available in the urban areas. Thus, households that receive cash remittance in the urban areas stand greater chances of investing more than their counterparts

in the rural areas. Apart from the North Central and South West zones where investments in households are significantly positive at 46.6% and 11.7% respectively when cash remittance increases marginally, the interaction between the two variables (cash remittance and households' investment) is significantly negative: North East -56.1%; North West - 28.1%; South East - 6% and South South -18.8%. The level of educational advancement among households in the North Central and South West could be responsible for the increases in households' investment when more cash remittance is received.

In households with male-heads, investment among cash remittance recipients is significantly positive at 75.2% in urban areas and 109% in the South East. This infers that there are increases in households' investment expenditures in the urban areas than in the rural areas. Given the disparities in the prevalence of social and economic infrastructures in the rural and urban areas which is in favor of the latter, most households invest in the urban areas than in the rural areas. Similarly, majority of households in the South East are astute in the act of trading which requires them to invest most of their receipts than their counterparts who are mostly salary earners in other geo-political zones.

Whether the households' heads are married or not has no significant role to play on changes in the households' investment expenditures in the rural and urban areas. In the geo-political zones, when the households' heads are married, investments in such households are negative in the North West at -18% and South East at -154% whilst, in the South South, it is significantly positive at 78.3%. These differences in investments may be due to the degree of risk aversion of households' heads to investment in the geo-political zones. If this degree is high, the households' investment propensities will be low and vice versa.

For those in the active age group or working population, the share of investments is significantly positive in rural areas and negative in the urban areas. This stems from the relative cost of livings in the urban and rural areas which is in favor of the latter and, thus, allows households in this area to invest more. In the North Central (2.0165), South East (1.2455) and South South (0.5856), the share of investments expenditures of households is largely positive, but conspicuously negative in the North West (-1.8297). The constituents of the North Central zone of Benue, Kogi, Kwara, Nassarawa, Niger, Plateau and Abuja are classified under the middle belts and most households in this zone share similar attributes with households in the southern zones. All other things being equal, an average household in the southern part of Nigeria invests more than it's counterpart in the north. Unsurprisingly, investment is low among households whose heads are in-active or aged in the South West. This group of households' heads is not physically strong to increase their income level and investment horizon.

The education of households' heads is an important determinant of the level of significance of households' investment. The shares of households' investment expenditures are significantly negative in rural areas and significant and positive in the urban areas. Alternatively, investments in households soar among cash remittance recipients at all educational backgrounds in the urban areas but decline in the rural areas. In the geo-political zones, the proportion of investment expenditures of households is more significant and increasing when the households' heads have tertiary education than when they are illiterates or unskilled.

Investments in households when the size of such households is large (above 3 members) is more significantly negative than when it is small (1- 3 members) in the urban areas of Nigeria. This is evident from the Table 6 in which households' investment expenditures fall significantly when the household's size is in the former category (above 3 members) at -73.1% and at 5 percent level of significance in contrast to a fall in investment of -15.8% in the latter group (1-3 members) in the urban areas. Investments in households respond significantly and positively across healthy households' heads at 40.2% in the rural areas and 73.6% in the South South. There is an overall increase in households' investment expenditures among this group.

Table 6. The Impact of Cash Remittance on Households Investment in Rural and Urban Areas and in the Geo-Political zones of Nigeria

Investment	Rural	Urban	North Central	North East	North West	South East	South South	South West
Cash Remittance	0.0728 (2.08) **	0.1309 (3.19) ***	0.4661 (7.15) ***	-0.5611 (-2.17) **	-0.2807 (1.94) *	-0.0603 (-1.07)	-0.1875 (-2.62) ***	0.1172 (2.31) **
Male-headed households	0.0345 (0.19)	0.7518 (3.92) ***		1.1440 (0.56)	1.2165 (0.73)	1.0974 (3.29) ***	-0.3281 (-0.95)	
Female-headed household			0.0100 (0.38)					-0.6190 (-3.06) ***
Married	0.1631 (0.89)	0.2591 (1.34)	1.0197 (3.12) ***		-0.1796 (-0.08)	-1.5358 (-5.97) ***	0.7826 (2.02) **	
Un-married				2.9983 (1.78) *				-0.7986 (-4.19) ***
Active	1.4038 (8.39) ***	-0.4038 (-1.91) *	2.0165 (6.33) ***	1.0707 (1.21)	-1.8297 (-2.65) **	1.2455 (3.74) ***	0.5856 (1.71) *	
In-active								-0.4529 (-2.19) **
No formal education. /vocation	-1.7163 (-8.42) ***			-0.2103 (-0.13)	-0.6870 (-0.79)			-0.8038 (-2.96) ***
Primary Education	-1.0665 (-5.45) ***	0.7030 (2.76) ***	0.9857 (3.23) ***		-0.8254 (-1.06)	-0.3855 (-1.06)	0.1223 (0.33)	
Secondary Educ.	-1.4719 (-8.81) ***	0.6565 (3.06) ***	0.5027 (1.74) *	2.5461 (1.78) *	0.07215 (0.11)	0.4043 (-1.15)	0.4546 (1.35)	-0.805 (-2.88) ***
Tertiary Education		0.3523 (1.58)	1.3254 (4.53) ***			3.0139 (3.46) ***	2.4818 (6.60) ***	-0.1572 (-0.60)
Households with 1-3 members	-0.3671 (-2.23) **	-0.1583 (-0.59)	-0.3431 (-1.46)	-2.5886 (-1.94) *	0.8163 (1.15)	-0.5493 (-1.23)	0.1360 (0.42)	0.3569 (0.095)
Households with 4-6 members		-0.7312 (-2.51) **		-0.8276 (-0.94)	-0.1161 (-0.23)	-1.8739 (-3.89) ***		
Households of 7 members & above	-0.3035 (-1.32)							-0.3454 (-0.86)
Few Affiliations			-1.1636 (-3.10)				0.3199 (0.82)	
Large Affiliations								
Healthy	0.4024 (3.02) ***		0.1059 (0.55)	0.1891 (0.18)	-0.309 (0.06)	0.1915 (0.87)	0.7355 (2.82) ***	0.1873 (1.10)
Unhealthy		0.2264 (1.52)						
R²	22.3%	6.9%	24.8%	66.9%	24.7%	35.8%	26.9%	12.0%
Observation	780	809	400	34	59	216	292	588

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.

5.3 Food Remittance

In Table 7, a percentage increase in food remittance generates significant and positive change in households' investments of 49.4% in rural areas and 74.2% in the South East. Households' investment expenditures increase significantly and positively when food remittance is sent by migrants in the rural areas than in the urban areas and in the South East than in other geo-political zones. Most of the agricultural produce in Nigeria are generated from the rural areas and when households that inhabit such areas get additional food supports from migrants, they tend to invest the surplus resource than the

situation that prevail in the urban areas where food remittance is consumed because of the dearth of this resource in the urban areas. Besides, investment is high among food remittance recipients in the South East because of their inclination towards investment relative to their counterparts in other geo-political zones. Also, the impact of food transfer on investments in households where the heads are males is significantly positive in the urban areas and negative in the South East. In the background of this study, male is found to invest more in the urban areas, ceteris paribus.

In households where the heads are married, investment among food remittance recipients is growing conspicuously at 6.93% in the urban areas and 345% in the South East at 1% level of significance. In the urban areas, most married couples work in different organizations and have different sources of income relative to their counterparts that work in the same farms or local crafts in the rural areas. The former, thus, have the potential of minimizing their levels of misfortune in the event of loss of income and can invest more than the latter. Furthermore, investment is high among households whose heads are married in the South East as most of them have greater propensities to invest.

Among households' heads that are active (15-60 years), there is a significant decline in the share of households' investments across food remittance recipients in the rural areas (-2.1042) and in the North West (-3.3936) while the share increases by 329% at 1% significant level in the urban areas. The reason is not far-fetched. Majority of households in the rural areas and in the North West are skillful in the act of farming and migrants may not see the need to send food remittance to households in these areas. Most households' heads in the urban areas are paid workers or business inclined and expenditures on food constitute lion's share of their households' budget. Thus, when they receive food supports from migrants, the resources that were previously used to purchase such consumables will now be available for investments.

It is obvious from the Table 7 that households' investment portfolio is significantly negative when the households' heads have different strata of education in the rural areas and significantly positive in the urban areas with mixed outcomes in the geo-political zones. This insinuates that food transfers are hardly sent to the rural areas relative to the urban areas.

Table 7. The Impact of Food Remittance on Households Investment in Rural and Urban
Areas and in the Geo-Political zones of Nigeria

Investment	Rural	Urban	North West	South East
Food Remittance	0.4939 (4.75) ***	0.0400 (0.39)	0.2747 (1.43)	0.7423 (6.15) ***
Male-headed households	0.1823 (0.10)	3.2994 (7.68) ***		-2.9996 (-4.00) ***
Female-headed household			-0.3329 (-0.52)	
Married	-0.3726 (-0.21)	0.0693 (5.81) ***		3.4515 (3.69) ***
Un-married				
Active	-2.1042 (-3.33) ***	3.2938 (5.81) ***	-3.3936 (-2.71) *	
In-active				2.4517 (03.59) ***
No formal education. /vocation				0.5412 (0.53)
Primary Education	-0.8731 (-1.02)	4.8992 (4.76) ***	-3.2804 (-2.53) *	-0.0182 (-0.02)
Secondary Educ.	-1.9033	3.8165	-3.9720	

	(-2.25) **	(5.28) ***	(-4.36) **	
Tertiary Education	-0.4652	4.9248		1.5552
	(-0.63)	(3.21) ***		(2.59) **
Households with 1-3 members	-1.2950	1.0292	3.3260	-0.1469
	(-1.66)	(2.54) **	(1.52)	(-0.15)
Households with 4-6 members	-1.4197	0.7270		-0.5052
	(-1.74) *	(1.04)		(-0.53)
Households of 7 members & above			1.6244	
			(1.22)	
Few Affiliations				
Large Affiliations				
Healthy			1.4657	2.6150
			(1.89)	(5.63) ***
Unhealthy	-2.0474	2.1454		
	(-3.79) ***	(2.70) ***		
R²	61.7%	86.5%	92.9%	80.6%
Observation	71	79	12	59

Source: Author's computation using Stata.

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

5.4 Other Remittances

In Table 8, other remittances make significant contribution to households' investment exclusively in the rural areas. In comparison to cash and food remittances, the quantities of other remittances sent to households are disproportionately low. A percentage increase in other remittances significantly and negatively affects households' investment by -26.8% in the rural areas. Given the insufficient amount of other remittances from migrants, most households utilize other remittances for consumption rather than investment. This kind of remittance does not contribute significantly to households' investments in the urban areas and in the geo-political zones.

Similarly, the share of households' investment expenditure is significant and negative when the headships of households are males in the rural areas. The reduction in households' investment expenses across this group may be borne from the fact that other remittances include items that are not cash or food related like drugs, clothes, school and hospital equipments and toiletries. Although such supplies could generate tremendous benefits to households in the rural settlement in general, the individual benefit across households may be difficult to measure. While cash and food remittances flow from migrants to their respective households, most of other remittances are given to specific communities or group of households in the form of the establishment of hospitals, schools, libraries, amongst others. In households where the heads are married, the households' investment expenditure among other remittance recipients is significantly increasing in the rural areas. From the background of this study, households whose heads are married receive more of other remittances from migrants than their counterparts that are not married.

In the case where households' heads are in the working population, the share of investment in such households is significantly negative in the rural areas. The inference is that most households' heads that are active receive less support of this type of remittance from migrants. Most donations and aids from migrants and other donor organizations are given to the needy like widows, the aged and helpless and less privileged children. Households whose heads are still active are, quite often than not, sidelined by these provisions.

.In Table 7 and subsequent ones, the results for some geo-political zones are not reported either because the sample size is insufficient or the estimates do not yield meaningful results.

The magnitude of investment embarked by households whose heads have completed secondary school education is significant and negative in the rural areas and significantly positive in the North West. As argued previously, most of the receipts from other remittances are put into consumption rather than investment in the rural areas. This may stem from the presumption that the amount of other remittances sent to this group of households is insufficient to spur increases in households' investment. However, the significance of investment in this set of households in the geo-political zone is circumscribed to the North West where its share to the total expenditure is significantly positive.

Households' investment expenditure is significant and positive when the size of the households is large (4-6 members) in the rural areas where the estimated coefficient is increasing at 2.6744 and significantly decreasing at -2.8951 in households where the size is above six members in the North West. Thus, the share of households' investment is rising relative to the total expenditure of the households in the rural areas and decreasing in the North West when the size of the households is large. The more the number of people in a household, the greater is the size of farms maintained by such households in the rural areas and the larger will be the share of their investment expenditure.

Table 8. The Impact of Other Remittance on Households Investment in Rural and Urban Areas and in the Geo-Political zones of Nigeria

Investment	Rural	North West
Other Remittance	-0.2680 (-4.12) ***	-0.0181 (-0.13)
Male-headed households	-2.0633 (-2.10) **	-0.4158 (-0.64)
Female-headed household		
Married	3.2904 (3.62) ***	
Un-married		
Active	-1.1061 (-2.38) **	
In-active		
No formal education. /vocation	-5.8772 (-7.24) ***	
Primary Education		2.2813 (2.50) **
Secondary Educ.	-1.4945 (-2.86) ***	3.4286 (3.20) ***
Tertiary Education	0.8270 (1.45)	
Households with 1-3 members		
Households with 4-6 members	2.6744 (5.91) ***	0.2166 (0.19)
Households of 7 members & above		-2.8951 (2.24) **
Few Affiliations		
Large Affiliations		
Healthy	3.0403 (6.76) ***	2.1033 (3.20) ***
Unhealthy		
R^2	92.8%	88.9%
Observation	32	18

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.

5.5 Probit

In Table 9, the probit estimates are carried out to verify the robustness of the OLS estimates on the impact of remittances on households' investments. The probit result validates the OLS result that remittances are more likely to significantly affect households' investments in both the rural and urban areas of Nigeria.

The probit estimate also agrees with the OLS estimate that remittances are less likely to make significant impact on households' investments across male-headed households in the urban areas. However, the impact of remittances is more likely to be significant on investments in the South East and less likely to be significant on investments in male-headed households in the South South geo-political zones of Nigeria.

The result from probit differs with the OLS estimate that remittances do not significantly affect households' investments across the married heads of households in the rural areas and in the South West. From the probit regression, remittances are less likely to significantly affect investments in households among this set or group in the rural areas and South West contrary to the OLS results. There is a consensus in both probit and OLS on the less likelihood of remittances in impacting investments among couples in the South East.

The estimate from probit corroborates with that of the OLS that remittances are more likely to affect investments in households when the heads of such households are in the active age groups (15-60) years in the urban areas. In the geo-political zones, both estimates suggest that remittances significantly affect households' investments where the heads are active in the North Central and South West.

In terms of education, both the Probit and OLS estimates are in consensus that remittances are less likely to impact households' investments when the households' heads have no formal education or vocation in the urban areas. However, the results contrast with the OLS estimates on this set of households in the geo-political zones of Nigeria. Similarly, when the heads of households have primary school leaving certificate, probit invalidates the OLS estimate by showing that remittances are less likely to impact investment in the rural areas and in the North Central zone. The same results are obtained by probit and OLS on primary school leavers in the urban areas. Different results are obtained by both estimates on secondary school leavers in the rural areas, urban areas and in parts of the zones.

The probit estimate concede to the OLS result that remittances are less likely to significantly affect households' investments when the size of the household is large (above four members) than when it is small (1-3 members).

Table 9. Probit Regression on the Impact of Remittances on Households Investment in
Rural and Urban Areas and in the Geo-Political zones of Nigeria

Poverty	Rural	Urban	North Central	North East	North West	South East	South South	South West
Remittance	0.0371 (1.91) *	0.0323 (1.73) *	-0.0265 (-0.80)	0.2399 (1.52)	-0.1411 (-1.55)	-0.1147 (-2.48) **	0.0379 (1.55)	0.0702 (2.54) **
Male-headed households	-0.1261 (-1.11)	-0.0845 (-0.87)	-0.6782 (-3.24) ***	3.3921 (2.23) **		1.5118 (4.85) ***	-0.2644 (-1.81) *	-0.3790 (-2.88) ***
Married	-0.0172 (-0.15)	0.1928 (1.90) *	0.9555 (5.14) ***			-1.3213 (-4.33) ***	0.3251 (2.04) **	0.0270 (0.22)
Active	-0.2008 (-2.09) **	0.5706 (6.14) ***	0.6055 (3.80) ***	0.5413 (0.52)	-0.0400 (-0.09)	0.5598 (2.83) ***	0.2446 (1.75) *	0.3618 (3.20) **
No formal education.	-0.1492	-0.1933	-0.0485	0.8609	-0.7796	2.3006	0.3140	-0.7776

/vocation	(-1.20)	(-1.73) *	(-0.24)	(0.78)	(-1.41)	(5.36) ***	(0.20)	(-5.28) ***
Primary Education	-0.4995	-0.2821	-0.0801	1.8837	0.8852	1.0186	-0.1908	-0.9966
	(-4.51) ***	(-2.59) **	(-0.47)	(0.97)	(1.56)	(3.02) ***	(-1.38)	(-6.79) ***
Secondary Educ.	-0.3308	0.1707	0.0897	0.0054	0.1088	1.3589	-0.0668	-0.3268
	(-3.31) ***	(1.94) *	(0.66)	(0.00)	(0.26)	(3.97) ***	(-0.54)	(-2.43) **
Households with 1-3 members	-0.1084	-0.0658	-0.0813	1.7741	-1.5869	-0.0437	0.1650	-0.6679
	(-0.89)	(-0.46)	(-0.36)	(1.24)	(-3.54) ***	(-0.10)	(1.10)	(-2.48) **
Households with 4-6 members	-0.2054	0.0961	0.1552	0.0729	0.0607	-0.3404	-0.2960	-0.2696
	(-1.58)	(0.62)	(0.64)	(0.09)	(0.16)	(-0.77)	(-1.83) *	(0.96)
Healthy	-0.0596	0.2540	0.3272	-0.2535	-0.1565	0.2221	0.1904	-0.1442
	(-0.67)	(3.30) ***	(2.63) ***	(-0.29)	(-0.44)	(1.09)	(1.85) *	(-1.45)

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.

5.6 Instrumental Variable Test

It is necessary to consider the possibility of external factors outside the model that may influence remittance income and make it to be correlated with the stochastic term. Thus, robustness check needs to be carried out on the key explanatory variables to ensure that the estimated results are not biased. The household income situation (S902) could affect remittance income (cash remittance) as well as the per capita investment expenditure of households. Similarly, the households' total non-food consumption expenditure may also make food remittance receipts to be endogenous. Instruments can be constructed on these variables that could influence cash and food remittances receipts to be endogenous.

Examinations on the strength or weaknesses of these instrument variables from Tables 10 showed that households' income situations are fundamental in making cash remittance receipts to be endogenous. Similarly, the total non-consumption expenditure of households (nfdtexp) has proved not to be a weak instrument, meaning that it is lurked in food remittance. For instance, cash remittance is correlated with the stability or non-stability of household income (0.0331) and its robust F-statistic, 65.84, is greater than 10. These estimates indicate that the household income variable (S902) is not a weak instrument. Again, there is correlation between food remittance and the total household non-food consumption expenditure (0.0002) and this result is validated by the robust F-statistics of 11.76.

Tables 10

Title: 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

Title: First-Stage Regression Summary Statistics

Variable	R-Square	Adj. R²	Partial R²	Robust F (1, 2409)	Prob. >F
Cash_Rem_d~1	0.0045	0.0043	0.0016	65.8432	0.0000

Source: Computed from Stata

Title: Correlation between Food Remittance (nfdremfd) and Total Household Non-Food Consumption Expenditure (nfdtexp)

Food Rem~1   nfdtexp

	Food Rem~1	nfdtexp
Food Remittance (nfdremfd)	1.0000	
Nfdtexp	0.0002	1.0000

Source: computed from Stata

Title: First-Stage Regression Summary Statistics

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

Source: computed from Stata

From the instrumental variable regression in Table 11, a one per cent rise in cash remittance increases households' investment by 7.9% as against 1.3% (in Table 6) when cash remittance is not extricated from the influence of endogenous variable. Intuitively, the first estimates indicated that cash remittance soars households' investments by 7.9%% while the second result stated that the increases in investments in households as a result of cash remittance is very much lower by 1.3%. In other words, in the absence of instrumental regression to purge the model from endogeneity, the impact of cash remittance on households' investment expenditures is smaller than what it should be at 7.9%.

Table 11. Instrumental Variable Estimates on the Impacts of Cash Remittances on Investment

Investment	Estimated Coeff.	Standard Error	Z	P> |z|	95% Confidence Interval	
Cash Remittance	0.0794	0.057	1.39	0.164	-0.0323	0.1912
Male	-0.047	0.029	-1.65	0.100	-0.1049	0.0091
Female						
Married	0.0627	0.037	1.68	0.092	-0.1027	0.1356
Un-married						
Active	0.1319	0.026	5.12	0.000	0.0814	0.1824
No Formal Education	-0.0134	0.044	-0.31	0.760	-0.0994	0.0726
Primary Education	-0.0800	0.039	-2.04	0.042	-0.1570	-0.0031
Secondary Education	0.0219	0.036	0.61	0.543	-0.0488	0.0926
1-3 Members	-0.0780	0.037	-2.11	0.035	-0.1503	-0.0057
4-6 Members	-0.0419	0.041	-1.03	0.301	-0.1214	0.0376
Healthy	0.0271	0.021	1.30	0.193	-0.0137	0.0679
Observation	2602					
R^2	1.89%					
Wald chi²	220.07					

Source: Author's computation using stata

From the Table 12, it can be seen that when the influence of the total non-food consumption expenditure of the household (nfdtexp) is extricated from food remittance, the latter has a significant and negative impacts on households' investment expenditures as against its non-significant impact when *nfdtexp* lurks in the food remittance (nfdremfd) variable. Specifically, a marginal change in food remittance from migrants reduce households' investments by 18.76% in comparison to its white noise or inconsequential impact (0.004 from Table 7) when there is the underlying influence of endogeneity.

Table 12. Instrumental Variable Estimate on the Impact of Food Remittance on Investment

Investment	Estimated Coefficient	Standard Error	Z	P> |Z|	95% Confidence Interval	
Food Remittance	-0.1875	0.0827	-2.27	0.023	-0.3497	-0.0254
Male	0.1149	0.1288	0.89	0.372	-0.1376	0.3675
Married	-0.1964	0.1515	-1.30	0.195	-0.4934	0.1004
Active	0.1258	0.1319	0.95	0.340	-0.1326	0.3843
No Formal Education	-0.4891	0.1333	-3.67	0.000	-0.7504	-0.2279
Primary Education	-0.4751	0.1421	-3.34	0.001	-0.7535	-0.1966
Secondary Educatio	-0.3567	0.0885	-4.03	0.000	-0.5301	-0.1832
1-3 Members	-0.2329	0.1542	-1.51	0.131	-0.5351	0.0694
4-6 Members	-0.2023	0.1629	-1.24	0.214	-0,5216	0.1170
Healthy	0.0241	0.08069	0.30	0.765	-0.1341	0.1822
Observation	275					
R^2	37.5%					
Wald Chi²	74.64					

Source: Author's Computation using Stata

6. Conclusion

More households invest in the rural areas relative to the urban areas. This is found in Table 5 in which 60.2% of households invest in comparison to less than 40% of households that invest in the urban areas. In the geo-political zones (as shown in Table 6), investments in households rank highest in the North East (65.1%). This is followed by the North West (65%), South West (64.8%), South East (57%) and South South (53%). On the impact of aggregate remittances on households' investments, this is direct in both the rural and urban areas as well as in the North Central, South South and South West zones. The relationship is, however, inversed in the North West and South East zones. In the case of cash remittance, it increases investments in households in the urban areas more than it does in the rural areas (similar to the aggregate remittances) and promotes investments in the North Central and South West zones. The positive impact of food remittance is circumscribed to the rural areas and the South East while those of other remittances are overwhelmingly negative and inconsequential in the rural and urban areas and in the geo-political zones.

6.1 Policy Implications

Given the findings that remittances have least impacts in the rural areas, North West and South East zones, the government of Nigeria needs to create the enabling environment that will promote the flow of remittances to these areas. This could take the form of formulating policies that will encourage the private sectors to establish more money transfer agencies in the rural areas and in zones where cash remittance has least impacts. In this way, migrants will not find it uneasy remitting money to their

households' members and others in their countries of origins. Furthermore, the charges paid by migrants in sending remittances need to decrease in areas and zones where there is a fall in investments due to decline in the flow of remittances. Secondly, there should be a re-orientation among migrants and households that receive remittances on the benefits of investing remittances in contrast to putting them in expensive ceremonies and lifestyles. Besides, a cut in tax on investible funds from remittances needs to be looked into as a fiscal measure. Similar measures should be replicated in other developing countries of Africa, Asia and South America where there are decreases in households' investment and remittances' supplies.

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