Determinants of Remittance Receipts in Rural Nigeria

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Abstract: This study uses NLSS, 2004 data collected for rural Nigeria to estimate a multinomial logit model of the economic and demographic determinants of migration and receipt of remittances in rural Nigeria. Findings show that most of the human capital variables are statistically insignificant. However for internal remittances, households with more educated members at the secondary school level (X_2), age of household head (X_4), number of male over age 15 (X_7), zones 1-3 and 5, land size (X_{11}) are positive and significantly associated with internal migration and receiving internal remittances. Likewise for international remittances, households with more educated members at the university level (X_3), age of household head (X_4) and land size (X_{11}) are positive and significantly associated with receiving international remittances.

Key words: Migration, remittances, multinomial logit, economic, significant, rural Nigeria

INTRODUCTION

It is estimated that >1 billion people around the world live in conditions of extreme poverty (UNDP, 2005). Approximately, three quarters or 75% of this population lives in rural areas and depends on agricultural activities to survive. Although, they are often very context-specific, common causes of poverty and food insecurity in rural communities include natural disasters (drought, flooding, etc.), civil conflict and structural inequalities. Such phenomena limit these populations' access to resources and opportunities to secure a sustainable livelihood. When local solutions are scarce or non-existent, poor families living in rural areas will often resort to sending a family member to a nearby urban centre or abroad in search of remunerated work. Due to migration and subsequent urban growth, Lagos, a city in Nigeria which did not appear in the list of 15 largest cities in 1950, occupied the 15th position in 1995 and is expected to jump to number 3 position in 2015 with >24 million inhabitants (Todaro, 1997). As regards movement outside Nigeria, there has been a remarkable increase in emigration to Europe, North America, the Middle East and South Africa from 1980's following economic downturn, introduction of liberalization measures and emergence of repressive military dictatorship (Adedokun, 2003). Once abroad, migrants send remittances to their households back home in order to ensure their basic necessities are met. Remittances are the funds that migrants transfer from their destination country to their country of origin. Such transfers may be made on a regular basis and/or sporadically in the event of emergencies or special events by using both formal channels such as banks and remittance agencies and informal channels such as the personal transport of items by the migrants themselves or migrating friends and relatives.

In fact workers' remittances have become a major source of external development finance. It is estimated that migrant remittance flows to developing countries now surpass Official Development Aid (ODA) receipts in many developing countries (Ratha, 2003). Migrants' remittances are currently ranked as the 2nd largest source of external inflows to developing countries after foreign direct investment. For example in 2001, official development finance transfers to developing countries were about US $57 billion; this compares with recorded global remittances of US $72.3 billion the same year (World Bank, 2003). Over the last decade, Nigeria is the single largest recipient of remittance in sub-Saharan Africa (Maimbo and Ratha, 2005). Nigeria receives between 30 and 65% of remittance to the region and 2% of global flow (Orozco, 2003). Remittance from Nigerians in various parts of the world was USD 2.8 billion in 2004 (World Bank, 2004), ranking second only to oil exports as a source of foreign exchange earnings. Nigeria was among the top 20 developing countries recipients of remittance in 2003 (Ratha, 2005). Commercial bank executives report that in 2006, the recorded flows were estimated at US $4.2

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billion dollars, representing 7,00,000 transactions and a 30% increase from 2005 (Orozco and Millis, 2007). According to Nigeria Muse, Remittances from Nigerians abroad hit $17.9 billion in 2008.

The overwhelming majority of remittances in Nigeria are person-to-person flows mainly from the United States, the United Kingdom, Italy and other Western European countries. Most transfers are through Money Transfer Organizations (MTO's). Currently, 21 out of 25 banks operating in Nigeria have agreements with MTO's. About 15 banks work with Western Union, 5 with Money Gram and one with Coinstar and Vigo Corporation (Vigo is owned by Western Union). Estimate of internal remittance is not known. Some economists believe that inflows from abroad have been a key factor to the stability of Nigerian naira against other international currencies in the past two years. According to DFID (2006), the main destination of remittances to Nigeria is Lagos which receives about 60% of the flows followed by Abuja which receives 15%. However, they are not necessarily the final destination of the funds. It is common for beneficiaries from smaller towns and villages to come to large cities to collect remittances. Estimate of remittances to rural as opposed to urban has not been given; increased rural out-migration presupposes that a substantial remittance flows to the rural area.

MATERIALS AND METHODS

A high proportion of internal and international migration in the 3rd world is caused by individuals seeking better economic opportunities. Internal migrants, usually coming from rural areas, stream into 3rd world cities seeking higher incomes in the industrial and service sectors of the economy.

Responding to similar stimuli, international migrants seek improved earnings in employment located outside of their home countries. Over the years, many studies have tried to identify the economic determinants of internal and international migration. Responding to the Harris and Todaro (1970)'s model, some economists have tried to explain 3rd world migration by focusing on the pull of differential expected earnings between origin (rural) and destination (urban) areas (House and Rempel, 1980; Falaris, 1979; Carvajal and Geithman, 1974). In these analyses, the rate of internal migration is typically related to aggregate characteristics of the origin and destination regions such as average wage, education and employment rates. These studies face several problems, most notably that of data aggregation. Adams Jr. (1993) argued while the explanatory variables in these studies relate to the total population of a particular region, migration is

typically an individual decision made on the basis of the income that one expects to receive given his/her own specific human capital characteristics such as age, education and skills. But recent studies emphasised that migration decisions are not taken by an individual in isolation but are influenced by the actual or intentional migration choices in one's peer group (Endogenous effects) or by the group's specific characteristics (Contextual effects).

Historically, there has been little explicit modelling of these types of externality in migration (migrant networks, peer influences, immigrant clusters, herd behaviour, chain migration). However, recent contributions show both theoretically (Epstein, 2002) and empirically (Epstein and Gang, 2006, 2004; Munshi, 2003) that social influences have a significant impact on the migrant's decisions about when and where to migrate. The use of aggregate census data thus tends to mask and even obscure critical parts of the migration decision making process. Cognisant of such problems in more recent years, economic demographers have started paying attention to the push factors involved in migration.

While past efforts to test migration models have relied mainly on data gathered in destination (urban) areas, new efforts have now been paid to collecting and analysing data gathered in origin (rural) areas (Bilsborrow *et al.*, 1987; Brown and Goetz, 1987; Findley, 1987). Such studies have tried to relate migration to a host of household variables such as education of household head, employment of household head, gender of household head, landholdings of households, etc. While illuminating, these origin level studies all fail to provide any analysis of what studies inspired by Harris and Todaro (1970)'s model regard as the key economic variable in any migration decision, namely income or earnings. Without any information on income (here, remittances) in origin or destination areas, these studies cannot be used to test the purely economic rationale behind any individual migration decision.

A large amount of academic discourse focuses on the selection bias, i.e., does migration tend to occur more among wealthier families that may be more mobile or among the poorer who have a lower opportunity cost of migration. Scholars disagree about the direction of the selection bias with respect to migration and thus indirectly with respect to remittances. Contrary to some scholarly work (Stahl, 1982; Lipton, 1980) which argues that migration (particularly to a foreign country) is an expensive venture and therefore only accessible to economically better-off households, Stark and Taylor (1989) find that in rural Mexico relatively deprived households are more likely to engage in international

migration than are better-off households. Adams Jr. (2004) finds that there is little selection bias with respect to families belonging to either the having migrant or non migrant categories. That is, migrant and non-migrant families are fairly randomly selected.

This study proposes to overcome problems encountered in these two preceding sets of studies by proposing a new framework for analysing the economic determinants of migration and receipts of remittances. This framework, it should be emphasised, does not present migration either as an income-differential or as a non-economic push phenomenon at the local level. Neither will it meddle with the unresolved issue of selection bias.

Rather the framework uses micro-level data to specify and estimate a model of migration that dichotomise between internal and external migration and uses the households as the level of analysis and includes data on both economic and demographic variables.

Further, the study attempts to make specific contributions by using origin level data collected by Nigeria Bureau of Statistics (NBS, 2005) in Nigeria (Rural sector) on such variables as education, employment, land etc., to analyse the determinants of international and internal migration and receipts of remittances. This is useful because relatively few studies have used micro-level data to analyse the determinants of international as opposed to internal migration and receipt of remittances in Nigeria.

Data: The study used the Nigeria Living Standards Survey (NLSS). The sample design was a 2-stage stratified sampling. The 1st stage involved the random selection of 120 housing units called Enumeration Areas (EAs) from each state and the Federal capital territory. At the 2nd stage, a total selection of 5 housing units from each of the selected EAs was chosen. Thus, a summing up to 22,200 households across the country (NBS, 2005). For the purpose of this study, the secondary data will be stratified into rural and urban sectors. The 2nd stage is the selection of the sampled rural households. The dataset provides detailed records on household expenditure, household income profile demography, education, health, employment and time use, housing, social capital and community participation, agriculture, non-farm enterprise, credit, assets and saving, income transfer and household income schedule and household characteristics.

Specification of model for receipt of remittances: To examine the factors that affect migration and the receipt of remittances, multinomial logit regression model was used. The probability of a household receiving remittance is characterized as a polychotomous choice between three mutually exclusive alternatives. Let U_{ij} denote the utility that the household derive by choosing one of the three outcomes:

$$U_{ij} = \gamma_j X_{ij} + e_{ij}$$

Where γ_j varies and X_{ij} remains constant across alternatives and e_{ij} is a random error term reflecting intrinsically random choice behaviour, measurement or specification error and unobserved attributes of the alternative outcomes. Let also P_{ij} ($j = 0, 1, 2$) denote the probability associated with the three choices with $j = 0$ is the probability of no remittance, $j = 1$ is the probability of receiving remittances from internal sources and $j = 2$ is the probability of receiving remittances from external sources. The multinomial logit model is given by:

$$P_{ij} = \frac{\exp(\gamma_j X_i)}{1 + \sum_{j=1}^{3} \exp(\gamma_j X_i) \ \text{for} \ j = 1, 2, 3} \quad (1)$$

P_{ij} is the probability of being in each of the groups 1 and 2.

$$P_{i0} = \frac{1}{3}$$

$$1 + \sum_{j=1} \exp(\gamma_j X_i) \ \text{for} \ j = 0, \ j = 1 \quad (2)$$

P_{io} is the probability of being in the reference group or group 0. In practice when estimating the model, the coefficients of the reference group are normalized to zero (Maddala, 1983; Greene, 1993; Kimhi, 1994). This is because the probabilities for all the choices must sum up to unity (Greene, 1993). Hence for 3 choices, only (3-1) distinct sets of parameters can be identified and estimated.

The natural logarithms of the odd ratio of Eq. 1 and 2 give the estimating equation (Greene, 1993) as:

$$\ln\left[\frac{P_{ij}}{P_{io}}\right] = \gamma_j X_i \quad (3)$$

This denotes the relative probability of each of group 1 and 2 to the probability of the reference group. The estimated coefficients for each choice therefore, reflect the effects of X_i's on the likelihood of the household migrating and receiving remittances (internal/external) relative to the reference group. However, the coefficients of the reference group may be recovered by using the formula (Hill, 1983):

$$\gamma3 = -(\gamma1 + \gamma2)$$

For each explanatory variable, the negative of the sum of its parameters for groups 1 and 2 is the parameter for the reference group. This however was not generated in this study.

Marginal effects: According to Greene (1993) by differentiating Eq. 3 and 4, the partial derivatives or marginal effects of the model on the probabilities are:

$$\frac{dP_j}{dP_j} = P_j(B_j - \sum P_k B_k)_k, \quad dP_{jk} \qquad (4)$$

When the marginal effects or partial derivatives are obtained the derivation techniques. Implicitly indicate that neither the sign nor the magnitude of the marginal effects need bear any relationship to the sign of the coefficients used in obtaining them (Greene, 1993):

Quasi elasticities: The marginal effects or partial derivatives (dP_j/dX_i) are obtained by differentiating Eq. 1 and 2 with respect to the particular explanatory variable. The derivation techniques implicitly indicate that neither the sign nor the magnitude of the marginal effects need bear any relationship to the sign of the coefficients used in obtaining them (Greene, 1993). The partial derivatives are converted to Quasi elasticities by using:

$$\eta_{Ji} = X_i \, (dP_j/dX_i)$$

Where, X_i is the mean value of X_i. The Quasi elasticity represents the percentage point change in P_j upon a 1% increase in X_i. These elasticities are superior to the coefficients and the partial derivatives by their ease of interpretation. However, like the derivatives they too may change sign as well as value when evaluated at different points (Basant, 1997).

Dependent variable:
Y_1 = Probability of migration and receiving remittances from internal sources
Y_2 = Probability of migration and receiving remittances from external sources
Y_3 = Probability of no migration and no remittance

In this analysis, the 3rd category (none) is the reference state.

Independent variables: The independent variables which are the economic and demographic variables that influence the decision to migrate and receive remittances

following; Schultz (1982), Adams Jr (1993, 2005), Carling (2008) and Zhu and Luo (2008) include:

X_i = Human Capital variables
X_j = Household Characteristics variables and
X_k = Migration network and wealth

Human capital:
X_1 = No. of members over age 15 with primary school education
X_2 = No. of members over age 15 with secondary school education
X_3 = No. of members over age 15 with university education

Household characteristics:
X_4 = Age of household head
X_5 = Gender (male = 1, 0 otherwise)
X_6 = Household size
X_7 = No. of males over age 15
X_8 = No. of females over age 15

Networks:
X_9 = Locational variables (6 GPZ)
South-South = 1
South-East = 2
South-West = 3
North-Central = 4
North-East = 5
North-West = 6

Wealth:
X_{10} = Owns a land (1 = yes, 0 if otherwise)
X_{11} = Land size (ha)

The rationale for including these variables in the equation follows the standard literature on migration and remittances. According to the basic human capital model, human capital variables are likely to affect migration because more educated people enjoy greater employment and expected income-earning possibilities in destination areas (Schultz, 1982; Todaro, 1997). In the literature, household characteristics such as age of household head and number of male members and children are also hypothesized to affect the probability of migration. In particular, some analysts (Adams Jr., 1993; Lipton, 1980) have suggested that migration is a life-cycle event in which households with older heads, more males over age 15 and fewer children under age 5 are more likely to participate. Because of the significant initial costs in financing migration, the economic literature often suggests that households with more wealth are likely

to produce migrants (Barham and Boucher, 1998; Lanzona, 1998). The model therefore includes wealth variables with the expectation that middle-wealth households will have the highest probability of producing migrants and receiving remittances. The most important aspect of the rural economic opportunity hypothesis states that land deprivation, particularly total landlessness or some small land holdings is a positive determinant of rural urban migration from rural areas either family's migration or individual's migration. Finally, since it is likely that location of residence in Nigeria will affect the probability of migration, 6 locational dummy variables-zones (with capital city omitted) are included in the model.

RESULTS AND DISCUSSION

Descriptives: Analysis of some selected characteristics of remittance recipient and non-recipient households (Table 1) shows some important contrasts between the three groups of households; non-remittance household, receive internal remittances and receive external remittances. On average when compared to non-remittance households, households receiving remittances (internal or external) have older household heads; smaller family size (household size) and share of food expenditure. Share of members of age ≥15 and FAO equivalent adult are relatively higher in external remittance receiving households than the other groups. Comparatively, the remittance recipient household heads have also a higher literacy rate. The higher literacy rate could be the causes for smaller share of children and family size in remittance recipient households.

Likewise, the size of land is biggest in households which received remittance from abroad followed by internal and the non recipient. Consequently, the rate of poverty is higher at non recipients and lowest at recipients from abroad. After analyzing some selected characteristics and the income and expenditure levels of the households, there appears to be a kind of income

hierarchy among the three groups of remittance receiving and non receiving households. That is, the households receiving no remittances have more household size, less educated heads, highest share of food expenditure with low average expenditure and hence they are relatively poorer. Conversely, the households receiving remittances from abroad are comparatively richer and the households receiving internal remittances are in between them.

Determinants of receipt of remittances: Table 2 shows the regression coefficients, standard error, estimated marginal effects and the Quasi elasticities from estimating the multinomial logit on the probability of household producing migrant and receiving remittances. The log-likelihood value for the model is -2468.725. The likelihood ratio index p-value is 0.2621 confirmed that all explanatory variables are collectively significant in explaining the probability of a household producing migrant and receiving remittance. In this study, Rahji *et al.* (2008) obtained p-value of 0.3145 while Zepeda (1990) reported p-value of 0.25 as representing a relatively good-fit for a multinomial logit model. Hence, the p-value of 0.2621 in this study is indicative of good-fit for the estimated model. Evidence from the model as contained in Table 2 shows that the set of significant explanatory variables varies across the groups in terms of the levels of significance and signs. Several of the outcomes are unexpected. For both sets of households (those receiving internal and international remittances), most of the human capital variables are statistically insignificant. However for internal remittances, households with more educated members at the secondary school level (X_2), age of household head (X_4), number of male over age 15 (X_7), zone 1-3 and 5 and land size (X_{11}) are positive and significantly associated with internal migration and receiving internal remittances. Likewise for international remittances, households with more educated members at the university level (X_3), age of household head (X_4) and land size (X_{11}) are positive and significantly associated with receiving international remittances. These suggest

Table 1: Selected characteristics of remittance recipient and non-recipient households

Variables	Receive no remittance	Receive internal remittances (from Nigeria)	Receive external remittances (from Africa and other countries)	t-test (internal remittances vs. no remittances)	t-test (external remittances vs. no remittances)
Mean age of household head (years)	46.77	53.66	61.67	-9.89***	-2.55***
Mean household size	4.96	4.14	4.25	7.03***	0.84
FAO equivalent adult	3.87	3.29	3.35	6.49***	0.80
Household head (literate = 1, 0 = illiterate)	0.47	0.52	0.50	-2.22**	-0.16
Mean annual per capita (expenditure excluding remittances)	28604.00	43345.00	111786.00	-10.94***	-1.59
Share of food expenditure	0.64	0.54	0.40	11.75***	3.49***
Mean household member age >15 years	4.83	5.45	6.08	-9.64***	-3.08
Mean annual per capita income (excluding remittances)	8688.00	35931.00	17931.00	-0.96	-0.68
Land size (ha)	7.66	10.03	18.53	-1.14	-1.40
Poverty status (poor = 1, 0 = otherwise)	0.54	0.29	0.08	12.53***	3.09***

*Significant at 0.10; **significant at 0.05; ***significant at 0.01

Table 2: Multinomial logit model for rural Nigeria

Variables	Receive internal remittances (from Nigeria)	Marginal effects and Quasi elasticities	Receive external remittances (from Abroad)	Marginal effects and Quasi elasticities
Human capital				
No. of members over age 15 with primary education (X_1)	0.027 (0.03)	0.000 (0.007)	0.135 (0.14)	0.000 (0.038)
No. of members over age 15 with secondary education (X_2)	0.035 (0.01)*	0.001 (0.042)*	0.137 (0.12)	0.000 (0.176)
No. of members over age 15 with tertiary education (X_3)	-0.046 (0.06)	-0.002 (0.007)	0.415 (0.16)**	0.000 (0.059)
Household characteristics				
Age of household head (X_4)	0.031 (0.01)***	0.001 (1.348)***	0.139 (0.03)***	0.000 (6.439)
Gender (male = 1, 0 = otherwise) (X_5)	-1.091 (0.37)***	-0.055 (0.910)*	-4.571 (1.95)**	-0.001 (3.941)
Household size (X_6)	-0.044 (0.02)**	-0.001 (0.205)**	-0.168 (0.13)	-0.000 (0.816)
No. of males over age 15 (X_7)	-0.119 (0.08)	-0.004 (0.466)	-1.122 (0.50)**	-0.000 (4.630)
No. of females over age 15 (X_8)	0.181 (0.09)**	-0.006 (0.106)**	-1.770 (0.48)***	-0.000 (1.232)
Network/location				
[zones = 1] (X_{91})	1.025 (0.18)***	-0.000 (0.158)	13.625 (825.65)	0.628 (2.296)
[zones = 2] (X_{92})	1.435 (0.18)***	-0.002 (0.209)	14.448 (825.65)	0.760 (2.435)
[zones = 3] (X_{93})	1.214 (0.19)***	-0.017 (0.092)	13.743 (825.66)	0.853 (1.162)
[zones = 4] (X_{94})	0.193 (0.21)	-0.018 (0.027)	13.181 (825.66)	0.614 (1.962)
[zones = 5] (X_{95})	0.423 (0.19)**	-0.013 (0.078)	13.959 (825.65)	0.608 (2.754)
Wealth				
Has land (1 = yes, 0 if otherwise) (X_{10})	-0.704 (0.17)***	-0.027 (0.486)***	-0.763 (1.12)	-0.000 (0.529)
Land size (ha) (X_{11})	0.321 (0.07)***	0.011 (0.410)***	0.437 (0.51)***	0.000 (0.565)
Constant	-3.584 (0.37)***	-	-17.511 (825.66)	-
Log likelihood	-2468.725	-	-	-
Restricted log likelihood	-5401.032	-	-	-
Pseudo R^2	0.2621	-	-	-
Chi-square (χ^2) (30)	514.21	-	-	-
Significance level	0.0000	-	-	-
N	13514	-	-	-

*Significant at 0.10; **significant at 0.05; ***significant at 0.01; Standard errors are in parentheses with coefficients; Quasi elasticities are in parentheses with marginal effects

that for internal remittances, households with more educated members at the secondary school level are more likely to receive remittances. Likewise for international remittances, households with more educated members at the university level have a higher propensity to receive remittances. Age of household head is significant with positive sign in internal remittance category suggest that the older the head the higher the propensity to receive remittances. Land ownership (Has land) and land size is significant with positive sign in all categories. Since land and land size represent wealth, this confirms the fact that migration (especially abroad) is an expensive venture and it only household that is well-to-do that can afford it (Portes and Rumbaut, 1990; Lipton, 1980).

As expected all the zones except zone 4 are significant with positive signs. Since, internal migration does not attract high cost relative to international migration, households in these zones are more likely to migrate internally and receive remittances. The positive sign implies that the probability of the households to migrate and receive either internal or international remittances relative to the reference group increases as these explanatory variables increase. The negative and significant parameter for the gender, household size has land, number of male over age 15 and number of female over age 15 means that the probability of being classified

in the two groups is lower relative to the probability of being placed in the reference group. Columns 2 and 4 of Table 2 shows the values of the estimated marginal effects and the Quasi elasticities calculated at the overall sample means following; Rahji *et al.* (2008) and Basant (1997) for all variables. The significant variables affect the probability of migrating and receiving remittances (internal or international). It is noteworthy that estimate not significantly different from zero indicate that the regressor or explanatory variable concerned does not affect the probability of migrating and receiving remittances relative to the reference group by the other two groups.

The multinomial logit does not share the monotonic bahaviour of binomial logit probability. Hence, the usual focus in literature is not marginal effects because the marginal effects depend on point evaluation and due to the nonmonotonic nature, the marginal effects can vary in sign according to the value of the dependent variable. Thus, there is some potential for confusion as marginal effects coefficients need not have the same sign as model coefficients. In literature, the Quasi elasticities rather than the marginal effects are used for explanatory purposes because they are easier to interpret (Basant, 1997). These partial elasticities of age of household head are elastic at 1.348 and 6.439 for the groups as classified. While only

age of household is elastic for the 1st group, the Quasi elasticities of number of male over age 15, number of female over age 15 gender of household head and network variables zones 1-5 variables for the 2nd group are elastic at 4.630, 1.232, 3.941, 2.296, 2.435, 1.162, 1.964 and 2.754, respectively. This mean that a 1% in the explanatory variable leads to a more than proportionate change in the probability of migrating and receiving internal remittances (1st group) or migrating and receiving external remittances (2nd group) relative to the reference group. The partial elasticities for the remaining variables are generally small in magnitude and are also inelastic. The inelasticity of the variables suggests that the probability of migrating and receiving internal or external remittances is not greatly affected by marginal changes in the variables as a one percent change in the variable leads to a less than proportionate change in the probability of migrating and receiving remittances relative to the reference group.

CONCLUSION

In this study, the determinant of migration and receipt of remittances by analysing household data collected by NBS with use of multinomial logit regression model which allow the decision to migrate and receive remittances to be assumed to be polychotomous choice between three mutually exclusive alternatives namely to migrate and receive internal remittances, to migrate and receive international remittances and no migration and no remittances. With no migration and no remittances as the reference category, the results showed that), most of the human capital variables are statistically insignificant. However for internal remittances, households with more educated members at the secondary school level (X_2), age of household head (X_4), number of male over age 15 (X_7), zones 1-3 and 5 and land size (X_{11}) are positive and significantly associated with internal migration and receiving internal remittances.

Likewise for international remittances, households with more educated members at the university level (X_3), age of household head (X_4) and land size (X_{11}) are positive and significantly associated with receiving international remittances.

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