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The Effect of Remittances on Educational Outcome in Uganda

By

Kaity Chen

A Thesis Submitted to

Department of Economics

Skidmore College

In Partial Fulfillment of the Requirement for the B.A Degree

While writing this thesis, I have not witnessed any wrongdoing, nor have I personally violated any condition of the Skidmore College Honor Code.

Thesis Advisor: Marketa Wolfe

May 3, 2023

Abstract

This study investigates the impact of remittances received on the highest level of education completed by the household members in Uganda. The results of our multinomial logistic regression analysis that uses survey data from Uganda in 2010 indicate that, after controlling for other variables, our independent variable—the total amount of remittances received—is only a significant predictor of the three highest level of education categories (Completed secondary education vs Didn't complete primary education category, Post-secondary diploma vs Didn't complete primary education category, and Degree and Above Education vs Didn't complete primary education). This could be due to the fact that households with lower and primary level of education understand the importance of education; therefore, they are more likely to invest in higher education.

1. Introduction

Remittances play a key role for Ugandans, providing vital funds from families abroad. Uganda receives a substantial amount of remittances due to the large flows that the Uganda diaspora remits home. According to Cooper, Esser, Peter, and Mohamod (2018), legal and formal cross-border remittances placed Uganda as the sixth-highest remittances-receiving country in Africa in 2016. The Bank of Uganda reported that Ugandans who were working abroad sent home a total of 1 billion dollars in 2022 alone (RemitSCOPE, 2022). Many Ugandans have taken it upon themselves to travel to areas with better economies to send remittances to improve conditions in their households. According to the Afrobarometer survey from 2019, a pan-Africa research network, 13% of the respondents stated that they depend on remittances for their upkeep (RemitSCOPE, 2022).

Since 2010/11, household education spending in Uganda was 3.31 % and has steadily increased, reaching 3.6% of the GDP in 2013/14. Enrollment is increasing as a result of population increase and improved attainment. However, public funding for the sector has not kept pace; it is consistently at 2% of the country's GDP, shifting the weight of education financing to households (Wodon et. al, 2016). This motivates my question of whether remittances contribute to better educational outcomes of the receiving migrant household members in Uganda.

We will examine the impact of remittances on education through the lens of the human capital theory. The human capital theory, developed by economists Gary Becker and Theodore Schultz in the 1960s transformed the economic landscape by offering a new viewpoint on human capabilities and investment opportunities. They theorized that education was an investment that could add to productivity; as more and more physical capital is accumulated, the opportunity cost

of going to school will also decline (Ross, 2021). In the context of remittances, they can be used as strategic investments in recipients' human capital, reflecting Becker and Schultz's view that education is an important component of human capital. Individuals, assumed to be rational decision-makers, receive remittances and will often use the funds to improve their educational prospects because they recognize that education serves as a transformative avenue for enhancing skills and improving opportunities. The recipients will leverage remittance inflows as a deliberate allocation towards education objectives.

Although the economic benefit of remittances has been widely documented, the complex nature of how these money transfers contribute to human capital development warrants further investigation. This study employs human capital theory as a theoretical framework to motivate the study of the intricate relationship between remittances and recipients' education development. The conceptualization of remittances as a form of human capital investments in the context of educational outcomes facilitates the development of the empirical specification model that is used to quantify the relationship.

The research question is: How does the role of migrant workers' remittances affect the education outcomes of the household members? Specifically, how does it affect the highest level of education completed in Uganda? My question will expand the existing literature and fill in the gap by reframing the question in the context of how the remittances earned by the migrants will affect the educational outcome, represented by the highest level of schooling completed, of remittances-receiving households' members specifically in Uganda. The combination of using the dependent variable, the highest level of schooling completed, to analyze the educational outcome within Uganda at a micro-level, with a focus on household members, makes my question novel. After estimating a multinomial logistic regression analysis, the findings indicate

that the total amount of remittances received predicts the highest level of education completed across several education categories. Specifically, remittances show significance for predicting educational attainment in three categories: Completed secondary education compared to the Didn't complete primary education category, Post-secondary diploma compared to the Didn't complete primary education category, and Degree and Above Education compared to the Didn't complete primary education category.

Section 2 provides a review of the literature relating to this research question. Section 3 discusses the data used in this paper. Section 4 is devoted to the econometric model.

2. Literature Review

This section will examine relevant literature on the impact of remittances on the educational outcomes of migrant households and is divided into three subsections. The first subsection discusses common findings from the extensive literature, the second examines literature in the context of Sub-Saharan Africa, and the last portion focuses on Uganda.

2.1 Common Findings

A prominent finding in the research literature on the impact of remittances on schooling was a generally positive relationship. The findings from the literature below showed that remittances to workers' homes have a major impact on educational outcomes, including higher enrollment rates, increased attendance, and lower dropout rates. Siddique and Shehzadi et. al (2016) exposed that remittances have not only negative and poverty plummeting effects but also positive effects on education expenditures. Askarov (2019) used meta-regression analysis to combine findings from 73 studies spanning 30 countries, yielding 1343 estimates of this impact,

to explore the question of whether remittances lead to an increase in household education spending. The study had a large and comprehensive sample size spanning various countries which increases the validity of the results, allowing for more generalization of the results to the broader population. The findings of our study supported the importance of economic resources in affecting educational decisions. Their findings showed that foreign remittances have a significant influence on education spending. In most of the countries in the study, the prevalence of international remittances caused an average 35% rise in education spending. Notably, in Latin America, this effect was even stronger, with a 53% increase in school spending connected with overseas remittances.

Kifle (2007) personally collected data throughout Eritrea's two administrative zones, notably the Central and Southern administrative zones, from 2001 to 2002 and they randomly selected from 125 households that receive remittances and have dependent children aged 7 to 20. The paper employed randomization in the selection of migrant households, which enhanced the validity of their results. Kifle (2007) found that households with higher remittances spend more on child education than those with lower remittances. However, the households with high remittances spent a smaller proportion of their remittances on education on average compared with those who received lower remittances. Although a rise in remittances resulted in a proportionately smaller increase in child education expenditure, it is clear that there was a general trend that households with higher remittances tend to spend more on child education.

Aleemudin, Iqbal, and Nosheen (2022) analyzed the data from the Pakistan Social Living Standard Measurement Survey from 2018 to 2019 to discover how remittances affect Pakistani children's access to quality education. They found that remittance-receiving households were more likely than non-receiving families to have educated children in Pakistan. Furthermore, in

their research, changing the pattern of the monthly transfer amount of remittances increased the chance of children enrolling in school by 0.15 percent. Calero, Bedi, and Sparrow (2008) estimated a probit model on the full sample of 8,600 children from the ages of 10 to 17 from Ecuador. Likewise, the authors used a nationally representative living standard household survey for Ecuador from 2005 to 2006. Similarly, they also found that remittances increased schooling attendance, particularly for girls, children in rural areas, and among the poor. A \$1 increase in monthly remittances led to a 0.09 percentage point increase in the enrollment rate in Ecuador. Extrapolating this implies that remittances were associated with, on average, a 19% decrease in non-enrollment. However, a limitation that the authors faced is that their data did not allow them to separate the effects of migration and remittances because there was an endogenous relationship between remittances and household risk. Therefore, they would not be able to determine a causality relationship between remittances and education.

Chaaban and Mansaur (2012) investigated the impact of migrant remittances on education in three countries (Jordan, Lebanon, and Syria) at a micro level. Their findings were that remittances had a significant positive impact on school attendance for age cohort 15-17 in Syria. Similarly, Sherpa (2012) found that remittances increase the probability of school attendance in Nepal for young girls (ages 6-10) and older boys (ages 11-18). According to the findings in Nepal, Bansak and Chezum (2007) highlighted that positive net remittances boost the likelihood of young children attending school. They examined the joint role of remittances and absenteeism on households' decisions to invest in children's human capital from a sample of 4,629 children from 3,373 households in Nepal. Cox and Ureta (2003) found that children from remittances-receiving households had a lower dropout rate from school in El Salvador. In urban

areas, the effect of remittances was at least 10 times the size of the effect of other income. In rural areas, the effects were about 2.6 times that of income.

Ngoma and Ismail (2013) examined aggregate level data from 1970 to 2010 of 89 developing countries. The sample included areas from important emerging countries in Asia, Africa, Latin America, the Caribbean, and Europe. This extensive geographical coverage ensured that the findings were relevant to broader applicability across regions, thus improving its external validity. They found that an increase in migrant remittance inflows by 1% was associated with a 2% increase in years of schooling at both secondary and tertiary levels which suggested that migrant remittances have the potential to relax liquidity constraints in developing countries. Dorantes, Georges, and Pozo (2010) investigated the effects of remittances on educational outcomes in Haiti. The authors tried to separate the effects of migration and remittances. Similarly, they also found that the households that received remittances have less of a budget constraint and it raises children's likelihood of being schooled. In the same fashion, Acosta (2006) suggested that girls and young boys (less than 14 years old) from remittance-receiving households seem to be more likely to be enrolled at school than nonrecipient households in El Salvador.

The literature above shows that remittances increase education expenditure which is a common finding within the vast literature. Remittance impacts are observed both at micro and macro levels. At the micro level, the impact of remittances goes beyond simple money transfers. These monetary distributions act as a crucial form of social insurance, providing a safety net for people and families (Lubambu, 2014). The influx of income via remittances boosts household expenditure, contributing to higher living standards and more access to goods and services. As

beneficiaries employ these cash inflows to meet fundamental requirements like education, healthcare, and housing, the overall well-being of households improves (Lubambu, 2014).

2.2 Evidence from Sub-Saharan African Countries

Studies done in Sub-Saharan African countries revealed that remittances had a favorable impact on educational indicators within households. Mawuena and Okey (2021) analyzed the effect of migrants' remittances on the education of recipient households in Togo in 2015. The authors estimated a binary logit model with the data from the Unified Questionnaire of Basic Indicators of Well-being survey among 2367 rural and urban households in Togo. They found that remittances from migrants increased the likelihood of education of recipients in Togo. The research approach could have been different if the authors had access to qualitative information about the reasons why certain household members are not in school.

Bouoiyour, Miftah, and Mouhoud (2015) conducted a study on a household survey sample of 598 randomly selected households and 2701 children in the southern rural region of Morocco. The primary goal of their study was to investigate the influence of cash remitted by overseas migrants on parental decisions about their children's educational pursuits. The primary outcome of their investigation was that remittances play an important role in positively influencing parents' decisions to support their children's education. According to the regression analysis, receiving remittances was a statistically significant factor that had a positive influence on school attendance. Notably, this favorable impact was stronger in rural Morocco and more significant for boys. The author also found that additional income derived from migration increases girls' education.

Lu and Treiman (2007) conducted a study that focused on the influence of remittances provided by South African Black labor migrants on their children's educational results. The researchers used cross-sectional data from the 1993-1994 Integrated Household Survey and panel data from the 2002 and 2003 South African Labor Force Surveys. This research highlighted the multifaceted function of remittances in encouraging education among the South African Black population. Beyond a financial means of support, remittances incentivized the improvement of educational results by addressing economic setbacks, lowering the need for child work, and mitigating the potential negative effects of parental migration. Their findings highlighted the particular dynamics of remittance patterns among South Africa's Black population, indicating a higher prevalence of remittance sending than other racial groups, resulting in a sample that is predominantly the Black community. This meant that they may not be able to generalize their findings among other racial groups.

Affudo (2020) examined the impact of remittances on educational results in Kenya, using data from the 2009 Kenya Migration Household Survey. The authors employed cross-sectional data with a probit model that addresses the endogeneity issue. The study additionally delved into whether remittances affect educational results differently for men and women. The study concluded that remittances had a large and positive influence on household members' education at the primary, secondary, and postsecondary levels. The study's findings highlighted a significant and positive relationship between remittances and household members' educational achievement at the primary, secondary, and university levels of schooling. Remittances had a positive impact on the education of females but a negative effect on the education of males. Affudo (2020) found that the influence of remittances on schooling differed according to the level of education and gender of household members.

Gyimah-Brempong and Asiedu (2014) conducted a thorough study of data from waves 3-5 of the Ghana Living Standards Survey (GLSS). The Ghana Statistical Service conducted this survey regularly to assess the living standards of a nationally representative sample of households. Using this extensive dataset and a probit model, the authors attempted to determine the influence of remittances on the likelihood of primary and secondary school attendance in Ghana. Their findings showed that foreign remittances had a statistically significant and beneficial influence on the likelihood of children enrolling in both primary and secondary schools in Ghanaian homes. The authors discovered that when a Ghanaian home switches from non-receiver to recipient of overseas remittances, the chance of a child enrolling in primary school increases significantly by 0.136. This represents a substantial positive effect, emphasizing the significance of remittances in improving children's access to elementary education in Ghana. Furthermore, the study found a significant influence on secondary education enrollment. When a home switches from non-receiver to recipient of foreign remittances, the likelihood of a child enrolling in secondary education rises by a stunning 50%. This emphasizes the major significance of remittances in increasing access to higher levels of education.

The works of literature above propose that remittances that flow into the workers' households are associated with increasing positive educational outcomes. These works are focused on various other Sub-Saharan African countries; however, there is a lack of literature about the remittance effect on households in the context of the highest level of schooling completed specifically in Uganda.

2.3 Evidence from Uganda

The literature in Uganda includes research that has gone into macro-level evaluations, exploring the impact of remittances on Uganda's economic growth and, as a result, their

influence on educational results. Furthermore, numerous pieces of literature have investigated distinct study contexts, such as the impact of remittances on household investment decisions or the relationship between mobile money use and remittance patterns. Matsumoto and Munyegera (2015) focused more on quantitatively estimating the effect of mobile money adoption on household real per capita consumption. They investigated the impact of mobile money access on household welfare by analyzing panel data from 846 rural families. The simple nature of remittances was seen as the major force behind this influence. Households that utilized mobile money were not only more likely to receive remittances but also had more frequent remittance transactions. The authors concluded that Ugandan household heads who adopted mobile money which allowed them to have more access to remittances, had two more years of education compared to their counterparts.

Hossain and Sunmoni (2022) studied the effect of remittances on household investment decisions using microdata from five predominantly remittance-receiving sub-Saharan African countries: Uganda, Kenya, Nigeria, Burkina Faso, and Senegal. They found an insignificant marginal effect of remittances on education investment in Uganda which may be attributed to the consequence of children dropping out of school due to migration expectations or making up for the migrant worker in household production.

Even fewer studies have concluded that remittances' effect on educational advancement is statistically negligible. Ferrone and Giannelli (2015) drew data from the Uganda National Panel Survey for the years: 2005, 2009, 2010, and 2011, and estimated models of school attendance and primary school completion. Because the authors had access to panel data, they believed that they were able to overcome unobserved heterogeneity, endogeneity, and selection bias. However, the authors were overly optimistic that panel data could completely eliminate these challenges

because it relied on the assumption that unobserved factors that influence education and migration decisions remain consistent over time. The study's findings provided insight into the numerous elements that influence educational outcomes in Uganda. One notable finding was the negative influence of household member migration and adult absences on school attendance. The observed negative consequences might be attributed to various causes, including a possible lack of supervision and having to substitute adults in household chores in Uganda. Surprisingly, the researchers discovered that remittances had no obvious effect on school attendance. This means that, at least in the study setting, the financial support supplied by remittances did not result in a substantial increase in school attendance.

Zerihun (2020) found that international remittances have a long-run impact on the economic growth of Ethiopia, Kenya, and Uganda. The study uses World Bank yearly data from 1990 to 2017. Given the nature of the dataset, the authors had to use unbalanced panel data which means missing data and even distribution across the periods, which can introduce selection bias. Notably, the pooled estimate conclusion using fully modified least squares (FMOLS) shows that the logarithm of remittances has a positive influence on the dependent variable, economic growth. However, it is worth noting that this influence is not statistically significant. Amega (2018) investigated the effect of remittance on education and health outcomes in 46 Sub-Saharan African countries, one of them being Uganda, from 1975 to 2014 and found that enrollment in secondary and tertiary education rises as real remittance per capita rises in Sub-Saharan Africa. The influence is stronger in secondary school than in higher school.

These papers either focused on the macro-level or the effects of remittances on Ugandan on its economic growth and indirectly on educational outcomes. Some other pieces of literature

listed above had different research contexts such as the effect of remittances on household investment decisions or the adoption of mobile money on remittances.

Several research projects have investigated the influence of remittances on education, with a particular emphasis on Latin America and Asia (Askarov (2019); Calero, Bedi, and Sparrow (2008); Cox and Ureta (2003); Dorantes, Georges, and Pozo (2010); Siddique and Shehzadi et. al (2016); Ngoma and Ismail (2013)). However, little research has investigated this phenomenon in diverse African countries. This regional disparity in research focus highlights the need for a more thorough knowledge of how remittances affect educational performance in varied African contexts. The current literature includes a variety of indicators used to analyze the association between remittances and education. These measures include school enrollments, attendance rates, and educational expenditures, among others. However, there is a lack of literature that uses specifically the variable, highest level of schooling completed, to represent educational outcomes. Furthermore, more research could be focused on the micro-level context of how remittances directly affect educational outcomes in Uganda. My thesis investigates how migrant workers' remittances affect the educational outcomes of the household members, indicated by the highest level of schooling completed, in Uganda. My contribution to the literature is the direct effects of remittances on educational outcomes in Uganda, focusing on households and individual levels because it is largely understudied, especially using my dependent variable of choice, the highest level of schooling completed. In addition, the paper not only looks at the effect of remittances on the education of the children of these migrant households but all members of the household.

3. Data and Methodology

3.1 Data Source

My data source is microdata from the World Bank called Migration Household Survey 2010. The data set's population is a sample survey data of households in Uganda in 2010. This paper's observations are individuals within the households. The survey was collected in the year 2010 from February to May with the method of face-to-face surveys. A significant advantage of the data is that it is publicly available because they are World Bank-published data, making this analysis easily reproducible. The Migration Household Survey 2010 is divided into parts, each dedicated to a certain category of questions answered by the participating households.

The survey's segmentation into different portions allows a precise and focused approach to data collection, which contributes to a more thorough understanding of migration phenomena within the surveyed households. The two sections that will be used in this study are Uganda Sections One and Four Household Members and Uganda Section Six Non-Household Members to provide a comprehensive analysis of the remittance transfer between the household and the migrant member. Given that both dataset segments come from the same Migration Household Survey 2010, integrating them seamlessly was straightforward. This merging process was made possible by the use of a common unique identifier, resulting in a coherent and united dataset. This unified dataset allows for a comprehensive investigation of migratory patterns, household compositions, and associated socioeconomic dynamics within the surveyed population.

While the dataset originally included a nationally representative survey of 2,000 families, the final sample size for the regression analysis was limited to 646 household members. This adjustment is the result of organizing, cleaning, and merging available data, during which

instances of missing data or households and members failing to give information relevant to the paper's research question were detected.

An additional benefit is the World Bank's sample strategy for the Migration Household Survey 2010; they utilized a random two-stage stratum-systematic sampling which means that households were chosen randomly which allows for better representation and further eliminates bias. They first selected Enumeration Areas (EA) which is proportionally based on number of households in the respective stratum. In the second stage, ten households were selected randomly from each of the two hundred EAs. The goal was to select four households with an international migrant, three with internal migrants, and three with no migrants. Separate sampling was done from each stratum using systematic sampling.

3.2 Variables

3.2.1 Dependent Variable

The dependent variable in this study is the Highest Level of Schooling completed. It is a categorical variable with six categories: “None”, “Didn’t complete primary”, “Completed primary”, “Completed secondary”, “Post-secondary diploma”, and “Degree and above”. The category where respondents answered “Don't know” was eliminated from the data set. In Uganda, primary school means students with ages 6 to 12. Secondary accounts for students with ages 13 to 18.

3.2.2 Independent Variable

In this study, the independent variable is the total amount of remittances made by non-HH (Household) migrants to HH in the previous 12 months. This variable is continuous,

allowing for a more detailed examination of the financial contributions made by non-household migrant members to their households. This variable is measured in Ugandan shillings with a range of 1,000 to 7,200,000 Ugandan shillings (Table 1).

Table 1. Descriptive Statistics for Remittances

Variable	Obs	Mean	Std. Dev.	Min	Max
Remittances	646	549,305.11	1,160,301	1,000	7,200,000

3.2.3 Control Variables

My empirical model includes eight control variables: stratum, household size, relationship to the household head, sex, age, marital status, current principal occupation, and region.

The control variable stratum is a categorical variable that represents whether the household lives in an urban or rural area (Figure 1). This binary variable assigns a value of 1 to urban families and 0 to rural households.

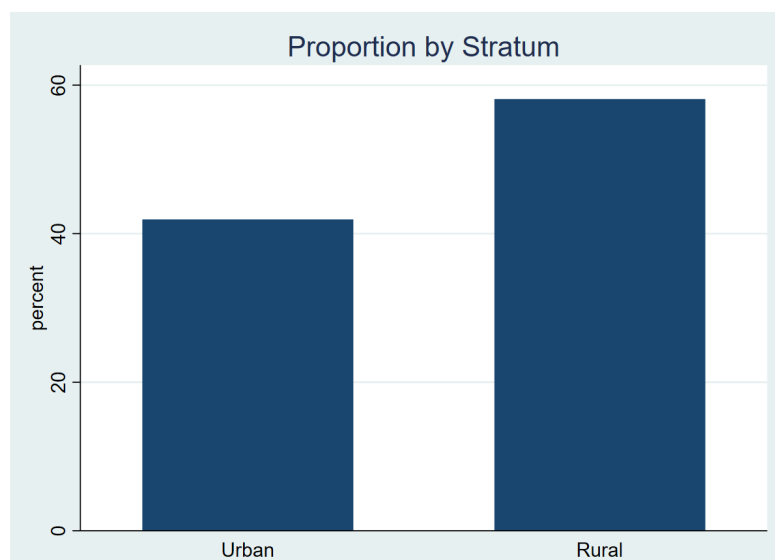


Figure 1. The Proportion of Household Members by Stratum

Household size is a discrete variable, indicating the number of non-migrant individuals in each home (Table 2). With values ranging from 1 to 15, this variable captures the variability of household sizes.

Table 2. Descriptive Statistics for Household Size

Variable	Obs	Mean	Std. Dev.	Min	Max
HH size	646	6.9628	3.2049	1	15

Relationship to the household head brings a social dimension to the dataset and is a categorical variable that describes each individual member's relationship to the household head. In the dataset, this variable has 12 categories listed in Table 3, including their frequencies. To streamline the analysis and interpretation, categories with a frequency of less than 30 have been combined under the label of "Others." Because some of these categories have very few observations, I condensed them into six categories shown in Table 4. The household head, followed by the spouse, son/daughter, brother/sister, grandson/granddaughter, and others are each assigned 0, 1, 2, 3, 4, and 5, respectively, to show the cumulation of each category. This grouping simplifies the data while preserving the integrity of higher-frequency interactions, allowing for the effective identification of overarching patterns and trends within households.

As a result, five binary variables are created: household head, spouse, son/daughter, brother/sister, and grandson/granddaughter. The reference category encapsulated the categories: son/daughter-in-law, father/mother, parent-in-law, nephew/niece, other non-relative, and servant/employee.

Table 3. Summary of Relationship to Household Head

Relationship to HH head	Freq.	Percent	Cum.
Head	166	19.48	19.48
Spouse	96	11.27	30.75
Son / Daughter	427	50.12	80.87
Son/Daughter-in-law	14	1.64	82.51
Father/Mother	3	0.35	82.86
Brother/Sister	32	3.76	86.62
Parent-in-law	1	0.12	86.74
Grandson/granddaughter	67	7.86	94.60
Nephew/niece	29	3.40	98.00
Other non-relative	8	0.94	98.94
Servant/employee	4	0.47	99.41
Other non-relative	5	0.59	100.00
Total	852	100.00	

Table 4. Relationship to Household Head Variable Reorganized

	Freq.	Percent	Cum.
0	166	19.48	19.48
1	96	11.27	30.75
2	427	50.12	80.87
3	32	3.76	84.62
4	67	7.86	92.49
5	64	7.51	100.00
Total	852	100.00	

Sex is a categorical variable represented by one binary variable. In a binary representation, females are represented by the value 0 and males by the value 1 (Figure 2). This method enables an unambiguous classification of gender within the dataset, permitting studies that investigate gender-specific patterns, roles, and features within households.

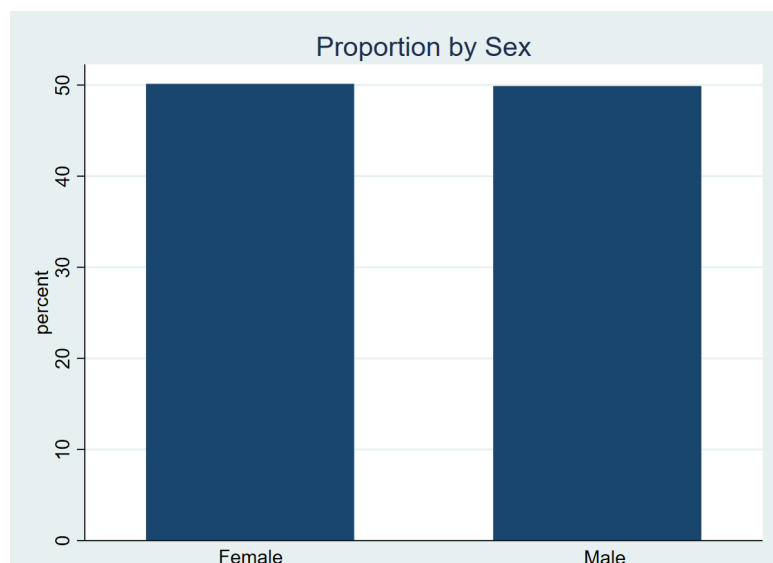


Figure 2. The Proportion of Household Members by Sex

The variable "Age" is a discrete variable that describes the age of household members. This variable, which ranges from 0 to 97 years old, captures the dataset's age-group diversity (Table 3).

Table 3. Descriptive Statistics for Age

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	852	22.5588	17.2	0	87

Marital status indicates the marital status of the individuals within the household: the categories are single, married, and others which include engaged, cohabiting, separated, divorced, or widowed (Figure 3). Dummy variables were created to incorporate the marital status variable into the analysis. A new binary variable "single" was created to represent single individuals. The "single" variable takes on the value of 1 if an individual is single and 0 otherwise. Similarly, another binary dummy variable was generated called "married" to represent married people. The "married" variable returns a value of 1 if the individual was married and 0 otherwise. Lastly, individuals with other marital statuses were treated as reference categories for comparison with single and married individuals.

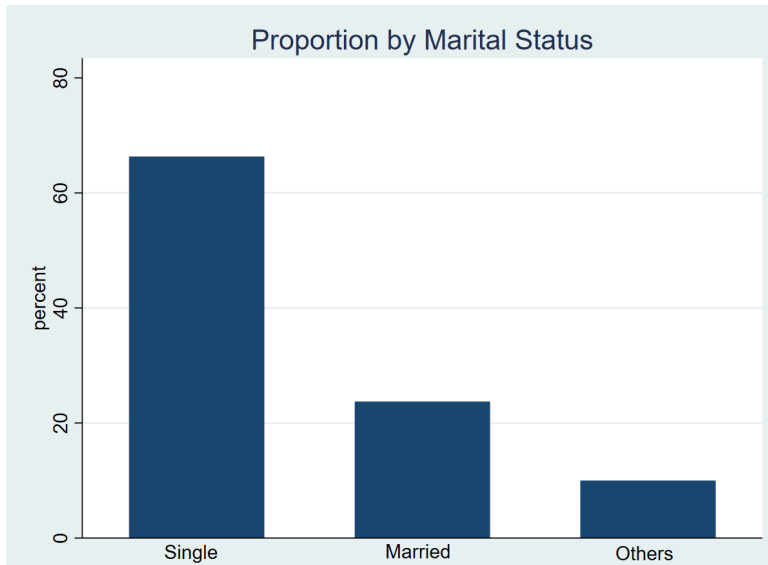


Figure 3. The Proportion of Household Members by Marital Status

The variable "Current Principal Occupation" is an important factor in comprehending the job landscape of the families under investigation (Figure 4). This category variable is a binary indicator that uses the values 0 and 1 to distinguish between two sorts of employment. First, individuals whose primary employment is not agriculture are assigned the value of 0. Conversely, the value of 1 denotes people whose primary occupation is agriculture.

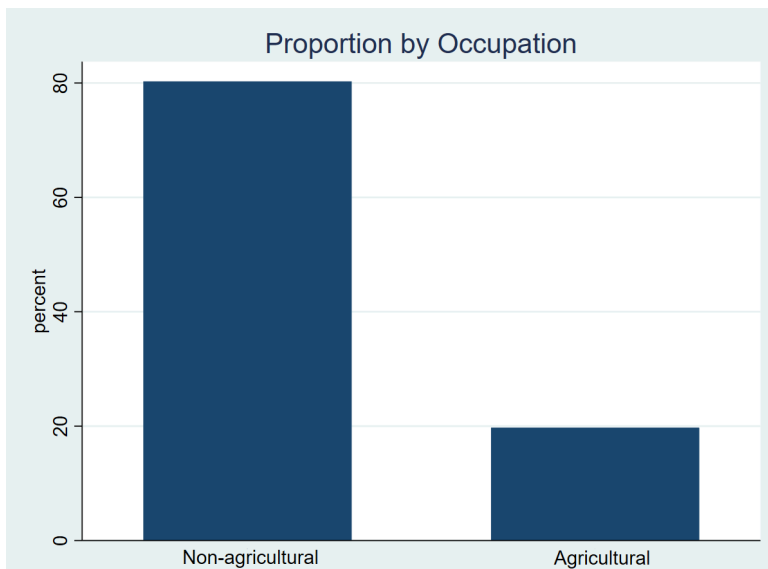


Figure 4. The Proportion of Household Members by Occupation

The variable "Region" in this dataset acts as a geographical identifier, providing information about the regional distribution of households in Uganda (Figure 5). Because the variable has four categories, three separate binary dummy variables are created for the region variable: central, eastern, and northern. The “central” variable takes on the value of 1 if an individual lives in the central region and 0 otherwise. The “eastern” variable takes on the value of 1 if an individual lives in the eastern region and 0 otherwise. The “northern” variable takes on the value of 1 if an individual lives in the northern region and 0 otherwise. The reference category is the western region.

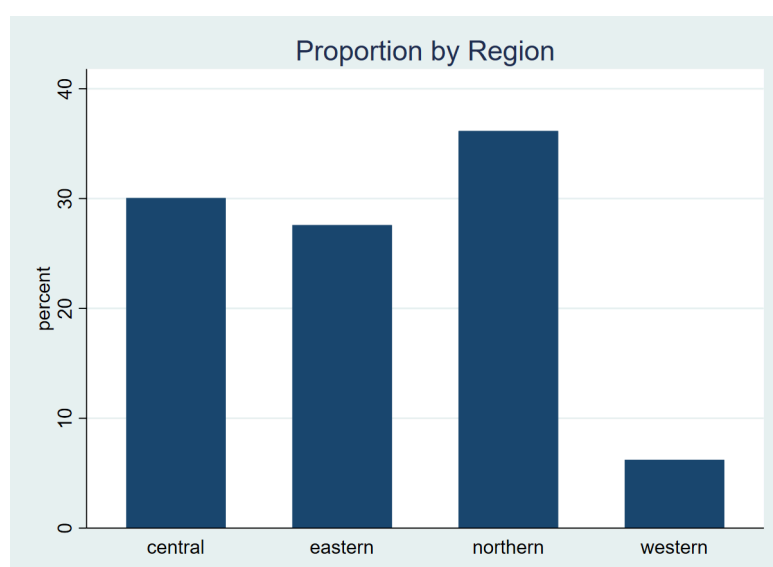


Figure 5. The Proportion of Household Members by Region

3.3 Econometric Specification

Inspired by Mawuena and Okey’s (2021) empirical model, which examined the influence of remittances on education in Togo, this study uses a similar framework to evaluate the link between remittances and educational results. Variables such as household size, residence, age, gender, and marital status, as established in their research, are variables that are included in this paper's empirical analysis. In the context of education, human capital theory implies that

household income influences academic outcomes, and this motivates our independent variable, remittances.

After assessing the goodness of fit of the multinomial logistic regression model, it was discovered that the AIC (Akaike Information Criterion) value of the full model, which included both independent and control variables, was lower than that of the model that only contained the independent variable and no control variables. This suggests that the complete model strikes a better balance between goodness of fit and model complexity than the simplified model with just the independent variable, remittances. The lower AIC value indicates that including control variables increases the model's explanatory power, resulting in a more accurate depiction of the link between the independent and outcome variables. This motivates the inclusion of the selected control variables within the model below.

The dataset is cross-sectional data, meaning that the dataset was collected at a point in time, in 2010. The regression model of choice is the multinomial logistic regression because the dependent variable has multiple outcome categories. The econometric model used to examine the determinants of the highest level of schooling completed is the regression model:

$$\begin{aligned} \text{Highest level of schooling completed}_{ij} = & \beta_0 + \beta_1 (\text{Total Amount of Remittances by non-HH} \\ & \text{migrant to HH in past 12 months})_{ij} + \beta_2 (\text{Stratum})_{ij} + \beta_3 (\text{HH size})_{ij} + \beta_4 (\text{Head})_{ij} + \beta_5 (\text{Spouse})_{ij} + \\ & + \beta_6 (\text{Son_daughter})_{ij} + \beta_7 (\text{Brother_sister})_{ij} + \beta_8 (\text{Grandson_granddaughter})_{ij} + \beta_9 (\text{Sex})_{ij} + \beta_{10} \\ & (\text{Age})_{ij} + \beta_{11} (\text{Single})_{ij} + \beta_{12} (\text{Married})_{ij} + \beta_{13} (\text{Current principal occupation})_{ij} + \beta_{14} (\text{Central})_{ij} + \beta_{14} \\ & (\text{Eastern})_{ij} + \beta_{14} (\text{Northern})_{ij} + \varepsilon_{ij}, \end{aligned}$$

where the subscript i is each household and the subscript j is each member within the household.

The β coefficients measure the impact of the independent variable on the dependent variable,

which is the highest level of schooling completed by the household member. The coefficient of interest is β_1 because it measures the impact of the remittances. The control variables are stratum (urban or rural), household size, each member's relationship to the household head where the represented by dummy variables: head, spouse, son/daughter, brother/sister, and grandson/granddaughter, sex, age, marital status which are represented by the dummy variables: single and married, current principal occupation, and region, represented by the dummy variables: Central, Eastern, and Northern. ε is the error term; representing unobserved factors that affect the highest level of schooling completed.

4. Results

4.1 Multinomial Logistic Regression Analysis

A multinomial logistic regression analysis is conducted to examine the relationship between the highest level of education completed, the dependent variable, and the total amount of remittances received, the independent variable, among the sample population of household individuals in Uganda. The dependent variable, the highest level of education completed, has six categories; "None", "Didn't complete primary", "Completed primary", "Completed secondary", "Post-secondary diploma", and "Degree and above". The category, "Didn't complete primary", is the base outcome for the analysis of the regression.

4.2 Interpretation of Results

4.2.1 Interpretation of Coefficients

Table A1 in the Appendix shows the multinomial logistic regression findings. The coefficients show the change in the log odds of completing each education level category

compared to the reference category, "Didn't complete primary", for a one-unit change in the total amount of remittances received while accounting for the effects of the control variables.

4.2.2 The Dependent Variable: Total Amount of Remittances

This subsection discusses the impact of remittances on education for each category of education. Table A1 in the Appendix shows that in the first two categories (None vs Didn't complete primary education category and Completed primary education vs Didn't complete primary education), the impact of remittances on education is not statistically significant, which can be seen by the p-value exceeding 0.1. However, in the other three categories (Completed secondary education vs Didn't complete primary education category, Post-secondary diploma vs Didn't complete primary education category, and Degree and above education vs Didn't complete primary education), the impact of remittances on education is statistically significant.

In the category "Completed secondary education vs. Didn't complete primary education", if the household receives one thousand Ugandan shillings increase in remittances, the multinomial log-odds for a household member having completed secondary education compared to not having completed primary would be expected to increase by approximately 0.0003 unit while holding all other variables in the model constant. In 2006, the average remittances a Ugandan household received were estimated to be at 993 dollars per year (*Report*, 2008). Given that 1000 Ugandan shillings is equal to 0.026 US dollars, this translates to 0.026 US dollars associated with a 0.0003 unit increase which is a substantial increase in the likelihood of completing secondary education compared to not having completed primary. The coefficient is significant with a p-value smaller than 0.1 (0.0514).

In the category “Post-secondary diploma vs. Didn’t complete primary education”, if the household receives one thousand Ugandan shillings increase in remittances, the multinomial log-odds for a household member having completed post-secondary diploma compared to not having completed primary would be expected to increase by approximately 0.0005 unit, all else held constant. The coefficient is statistically significant with a p-value smaller than 0.05 (0.0308).

In the category “Degree and above education vs. Didn’t complete primary education”, if the household receives one thousand Ugandan shillings increase in remittances, the multinomial log-odds for a household member having completed a degree and above post-secondary diploma compared to not having completed primary would be expected to increase by approximately 0.0006 unit, all else held constant. The coefficient is statistically significant with a p-value smaller than 0.05 (0.0002).

4.2.3 The Control Variable: Stratum

This subsection discusses the impact of the control variable, Stratum, on education for each category of education. Table A1 in the Appendix shows for stratum the only relationship that was insignificant was when “None” was compared to “Didn’t complete primary education”.

In the category “Completed primary education vs. Didn’t complete primary education”, if the household member lives in an urban location, the multinomial log-odds for that individual having completed primary education relative to not having completed primary would be expected to be approximately 0.7138 unit higher than living in a rural area, while holding all other variables in the model constant. The coefficient is statistically significant with a p-value smaller than 0.05 (0.0068).

In the category “Completed secondary education vs. Didn’t complete primary education”, if the household member lives in an urban location, the multinomial log-odds for that individual having completed secondary education relative to not having completed primary would be expected to be approximately 1.5276 units higher than living in a rural area, while holding all other variables in the model constant. The coefficient is statistically significant with a p-value smaller than 0.05 (0.000).

In the category “Post-secondary diploma education vs. Didn’t complete primary education”, if the household member lives in an urban location, the multinomial log-odds for that individual having completed post-secondary education relative to not having completed primary would be expected to be approximately 2.5415 units higher than living in a rural area, while holding all other variables in the model constant. The coefficient is statistically significant with a p-value smaller than 0.05 (0.0023).

In the category “Degree and above education vs. Didn’t complete primary education”, if the household member lives in an urban location, the multinomial log-odds for that individual has completed a degree and above post-secondary diploma relative to not having completed primary would be expected to be approximately 4.1602 unit higher than living in a rural area, while holding all other variables in the model constant. The coefficient is statistically significant with a p-value smaller than 0.05 (0.000).

4.3 Discussion of Results and Limitations

The results of the multinomial logistic regression analysis suggest that the total amount of remittances received is a predictor of the highest level of education completed only for the three highest levels of education categories (Completed secondary education vs Didn’t complete

primary education category, Post-secondary diploma vs Didn't complete primary education category, and Degree and Above Education vs Didn't complete primary education), after controlling for the effects of the other variables.

The findings are consistent with the expectations of human capital theory, which emphasizes the necessity of investing in education to increase individuals' productivity and economic welfare. Our analysis found a positive association between remittances and schooling results, supporting the idea that remittances are a type of human capital investment inside homes. Individuals who receive remittances are more inclined to allocate money to education, boosting their human capital accumulation and future potential. However, it is important to note that for the three significant results, the coefficient associated with remittances is extremely small, which could indicate a negligible effect on the likelihood of remittances on education overall.

Several factors might explain the non-significant association between remittances and educational attainment categories. Structural barriers such as restricted access to quality education or cultural norms governing gender roles may undermine the potential benefits of remittances on educational achievements. This reason may be supported by our significant variable "Stratum," which indicates that household members living in urban regions have a higher expected likelihood to have completed higher levels of education relative to not having completed primary education.

This study uses cross-sectional data from 2010, which may not fully capture the temporal dynamics of remittance movements. Remittances may have been more prevalent in previous or subsequent years. While a panel dataset would have been preferred for investigating longitudinal patterns, it was not available for Uganda.

Another potential limitation arises from the lack of household responders for certain questions which creates missing data; posing a problem because if certain data points are missing, this may result in the exclusion of specific samples. Therefore, there may be underrepresentation issues and selection bias because only certain households may respond to the questionnaire. Another issue that may arise is that since I have to merge two datasets in the same data survey (split into parts depending on Questionnaire categories), only certain households provide the total amount of remittances sent by the migrant worker or received by the household. This significantly cut down the amount of households and individual data that I was able to work with. This feature of my data may affect the results.

This study is undertaken at the micro-level context of Uganda providing insights into household-level dynamics that have been underexplored in earlier studies. This technique gives a more comprehensive view of the relationship between remittances and educational results, which is especially important in a society where such analyses are underrepresented. Furthermore, my study includes a new dependent variable, the highest degree of schooling completed, allowing for a more thorough analysis of educational outcomes beyond traditional measures. By concentrating on the entire household rather than just the children, we were able to shed light on the larger impact of remittances on human capital accumulation within these migrant families. This comprehensive method gives useful insights into the distribution and utilization of remittance payments for educational purposes, giving a better understanding of the mechanisms by which remittances influence human capital accumulation.

4.5 Conclusion, Policy Implication, and Future Agenda

This paper asks the question of how do migrant workers' remittances impact the educational results of their household members? More specifically, how does it effect the highest level of education completed in Uganda? Using survey data from Uganda from year 2010 and multinomial logisite regression, the results show that our independent variable, total amount of remittances received, is only a significant predictor of the three highest level of education categories, after accounting for the effects of other variables. These three categories are: Completed secondary education vs Didn't complete primary education category, Post-secondary diploma vs Didn't complete primary education category, and Degree and Above Education vs Didn't complete primary education. The findings are consistent with the literature review, indicating a positive relationship between received remittances and enhanced educational outcomes. However, the significance of these results is observed primarily at higher levels of educational attainment.

The economically nonsignificant findings on remittances show the necessity of taking into account a broader range of factors impacting educational attainment in migrant households. While remittances are frequently viewed as a crucial driver of educational results, our research emphasizes the importance of accounting for additional contextual factors that may interact with remittances to influence school attainment.

As previously mentioned, government expenditure on public education has stayed at a constant rate. The result from my study contributes to the existing literature by suggesting that household remittances contribute significantly to the upper levels of education for individual household members in Uganda. This could be due the fact that household members that already have lower level education recognize the value of education and are more inclined to invest in

further education. Therefore, a policy implication from the study is that governments and policymakers should implement mechanisms to invest in lower and primary levels of education. Recognizing the importance of remittances in supporting education, policies could be developed to give assistance and resources to migrant families to guarantee that remittances are used effectively for educational purposes. Scholarships, subsidies, or infrastructure enhancements in places with high remittance inflows are examples of particular efforts to encourage school access. This might include access to financial services and educational programs for migrant families to understand the utilization of remittances in supporting education.

Future studies could explore the interactions between remittances and other factors, such as access to educational resources and parental involvement, to better understand the subtle dynamics of remittance impacts on schooling. For example, researching the importance of parental engagement in educational decision-making processes might shed light on how remittance funds are distributed and used for educational reasons within homes. Similarly, looking into the influence of community-level resources and support systems on educational access and achievement can help contextualize the impacts of remittances within larger socio-cultural settings. Future research can advance our understanding of the subtle nuances of remittance impacts on schooling by taking a broader perspective and employing other methodological approaches, as well as inform more targeted interventions and policies aimed at promoting educational equity and access among households and communities with migrant family overseas.

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Appendix

Table A1. Results of Multinomial Logistic Regression

Highest_level_school	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
None							
Remittances1000	-.0002	.0002	-0.79	.4296	-.0005	.0002	
Stratum1	.1907	.2664	0.72	.4741	-.3314	.7129	
Hh_size	-.0386	.0422	-0.91	.3604	-.1213	.0441	
Head	1.3404	.7871	1.70	.0886	-.2023	2.8832	*
Spouse	.6342	.8473	0.75	.4542	-1.0265	2.2949	
Son_daughter	.6184	.5845	1.06	.29	-.5271	1.7639	
Brother_sister	-.5042	1.19	-0.42	.6718	-2.8365	1.8281	
Grandson_granddaug	.8385	.6519	1.29	.1983	-.4391	2.1161	
Sex	-.4229	.252	-1.68	.0933	-.9167	.071	*
Age	-.0428	.0157	-2.73	.0064	-.0736	-.012	***
Single	-1.1966	.6156	-1.94	.0519	-2.4032	.0101	*
Married	-.3595	.5746	-0.63	.5316	-1.4857	.7667	
Occupation	-.3652	.4664	-0.78	.4336	-1.2793	.5489	
Central	.2882	.635	0.45	.65	-.9563	1.5326	
Eastern	.003	.6274	0.00	.9962	-1.2266	1.2326	
Northern	.3957	.617	0.64	.5214	-.8137	1.605	
Constant	.3062	1.1538	0.27	.7907	-1.9551	2.5675	
Didn't complete primary (base outcome)							
Completed_primary							
Remittances1000	0	.0001	0.36	.7189	-.0002	.0003	
Stratum1	.7138	.2638	2.71	.0068	.1968	1.2308	***
Hh_size	.0677	.039	1.74	.0824	-.0087	.144	*
Head	1.2238	.6514	1.88	.0603	-.053	2.5005	*
Spouse	.4687	.7112	0.66	.5099	-.9252	1.8627	
Son_daughter	.0914	.4519	0.20	.8397	-.7942	.977	
Brother_sister	1.1885	.6158	1.93	.0536	-.0184	2.3955	*
Grandson_granddaug	-1.5553	.8548	-1.82	.0688	-3.2308	.1201	*
Sex	-.1921	.252	-0.76	.4457	-.686	.3017	
Age	.006	.0125	0.48	.6313	-.0186	.0306	
Single	.0915	.5861	0.16	.8759	-1.0572	1.2403	
Married	.4665	.5249	0.89	.3742	-.5624	1.4954	
Occupation	-.6861	.3883	-1.77	.0772	-1.447	.0749	*
Central	.6346	.5043	1.26	.2083	-.3539	1.6231	
Eastern	-.1148	.5173	-0.22	.8244	-1.1286	.899	
Northern	-.1936	.5171	-0.37	.7082	-1.2071	.82	
Constant	-2.1314	1.0029	-2.13	.0336	-4.0971	-.1657	**
Completed_secondary							
Remittances1000	.0003	.0001	1.95	.0514	0	.0005	*
Stratum1	1.5276	.3263	4.68	0	.8881	2.1672	***

Hh_size	-.006	.0458	-0.13	.8953	-.0958	.0838	
Head	.5221	.6837	0.76	.4451	-.818	1.8621	
Spouse	.2107	.7608	0.28	.7819	-1.2806	1.7019	
Son_daughter	-.1517	.4807	-0.32	.7523	-1.0939	.7905	
Brother_sister	.2228	.7251	0.31	.7587	-1.1984	1.6439	
Grandson_granddaug	-17.0288	2190.2852	-0.01	.9938	-4309.9089	4275.8513	
Sex	.0464	.3017	0.15	.8777	-.5449	.6378	
Age	.0384	.0128	2.99	.0028	.0132	.0635	***
Single	-.0353	.6466	-0.05	.9565	-1.3025	1.232	
Married	.4624	.5597	0.83	.4087	-.6346	1.5593	
Occupation	-1.4912	.4491	-3.32	.0009	-2.3715	-.6109	***
Central	1.1067	.6013	1.84	.0657	-.0718	2.2852	*
Eastern	.5895	.6274	0.94	.3475	-.6402	1.8192	
Northern	.3673	.6313	0.58	.5607	-.8699	1.6045	
Constant	-3.4272	1.1565	-2.96	.003	-5.6939	-1.1606	***

Post_secondary_diploma

Remittances1000	.0005	.0002	2.16	.0308	0	.001	**
Stratum1	2.5415	.8325	3.05	.0023	.9099	4.1732	***
Hh_size	.2102	.1009	2.08	.0372	.0125	.4079	**
Head	2.2981	1.2723	1.81	.0709	-.1956	4.7917	*
Spouse	2.421	1.5054	1.61	.1078	-.5296	5.3715	
Son_daughter	-.4598	1.0057	-0.46	.6475	-2.4309	1.5113	
Brother_sister	-16.8993	6333.5078	-0.00	.9979	-12430.346	12396.548	
Grandson_granddaug	-16.7221	4441.2278	-0.00	.997	-8721.3686	8687.9244	
Sex	.6551	.697	0.94	.3473	-.711	2.0211	
Age	.0295	.0248	1.19	.234	-.0191	.0781	
Single	.2526	1.2831	0.20	.8439	-2.2622	2.7674	
Married	.3338	1.0527	0.32	.7512	-1.7295	2.397	
Occupation	-18.472	2650.0938	-0.01	.9944	-5212.5603	5175.6164	
Central	19.0906	6957.2378	0.00	.9978	-13616.845	13655.026	
Eastern	19.7073	6957.2379	0.00	.9977	-13616.228	13655.643	
Northern	18.6266	6957.2379	0.00	.9979	-13617.309	13654.562	
Constant	-26.8347	6957.2382	-0.00	.9969	-13662.771	13609.102	

Degree_and_above

Remittances1000	.0006	.0002	3.69	.0002	.0003	.0009	***
Stratum1	4.1602	.9357	4.45	0	2.3262	5.9942	***
Hh_size	.1804	.079	2.28	.0224	.0255	.3354	**
Head	2.9727	1.1547	2.57	.01	.7095	5.2358	**
Spouse	2.4699	1.3465	1.83	.0666	-.1692	5.1091	*
Son_daughter	1.429	.983	1.45	.146	-.4977	3.3557	
Brother_sister	-13.2579	1310.5595	-0.01	.9919	-2581.9073	2555.3915	
Grandson_granddaug	-13.028	2626.2103	-0.00	.996	-5160.3056	5134.2496	
Sex	.8292	.5317	1.56	.1189	-.2129	1.8713	
Age	.089	.0224	3.97	.0001	.0451	.133	***
Single	1.017	1.076	0.95	.3446	-1.0918	3.1259	
Married	.6114	.9125	0.67	.5029	-1.1771	2.3999	
Occupation	-2.9332	1.1445	-2.56	.0104	-5.1763	-.6901	**

Central	.8625	.7777	1.11	.2674	-.6618	2.3867	
Eastern	.9755	.8879	1.10	.2719	-.7647	2.7158	
Northern	-15.9818	1054.1937	-0.02	.9879	-2082.1635	2050.1999	
Constant	-12.4519	2.3894	-5.21	0	-17.1351	-7.7688	***
<hr/>							
Mean dependent var	1.6037	SD dependent var					1.2871
Pseudo r-squared	0.1865	Number of obs					646
Chi-square	359.5702	Prob > chi2					0.0000
Akaike crit. (AIC)	1738.2912	Bayesian crit. (BIC)					2118.3091

*** $p < .01$, ** $p < .05$, * $p < .1$

Note: P-values less than 0.01 (***), 0.05 (**), and 0.1 (*) denote the degree of significance, with lower values indicating greater evidence against the null hypothesis.