Left Behind, but Included: The Case of Migrant Remittances and Financial Inclusion in Ghana

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ABSTRACT
Migration is often viewed negatively because of the homelessness, city congestion, and other ills it has often been tagged with. But, 'Every coin has a flipside'. Using data from the Ghana Living Standard Survey (Round 6), this study explores how remittances sent by migrants promote access to and usage of a broad range of financial services. We employ a novel econometric methodology, the endogenous switching probit regression which effectively handles selection on observables and unobservables as well as endogeneity. Treatment effect predictions show that remittances increase the probability of receiving households owning an account, saving, accessing credit and holding insurance policy by 14 percentage point, 8 percentage point, 4 percentage point and 11 percentage point respectively compared to analogous non-receiving households. Remittances confer similar financial inclusion benefits on a randomly selected household and on the counterfactual –the financial inclusion level of those households that did not receive remittances had they received remittances. This implies that remittances foster financial inclusion of the left behinds. This unambiguous impact of remittances on financial inclusion calls for a more balanced view by policy makers and other stakeholders regarding both internal and external migration.

JEL Classification: D14; F22; F24; N37

Keywords: Migration; Remittances; Financial inclusion; Endogenous switching probit; Ghana

1. INTRODUCTION

This study examines the effect of remittances on financial inclusion in Ghana. Financial inclusion entails the provision of a wide range of financial services at low cost to especially the poor and marginalised in society. The premise is that, if the poor have easy access to loans, savings facilities, credit, insurance services, financial education and financial products, they stand a better chance of lifting themselves out of poverty. The poor are the most vulnerable to micro and macroeconomic shocks. But, if the poor have access to finance, it can mitigate the impact of economic shocks on their livelihood (Manuamorn, 2007). Financial inclusion can also help the poor to save more, raise capital for investment, earn more income and consequently raise their levels of living (Giuliano and Ruiz-Arranz, 2009).

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Yet, developing countries and the poor in particular, are the most financially excluded. According to Demirguc-Kunt et al. (2015) who explored the Global Findex database, while up to 90.6% of adults in high income countries have an account with a formal financial institution only 54.1% of adults in low and middle income countries have accounts in a formal financial institution. They also report that, while up to 22.5% of adults saved with formal financial institutions in low and middle income countries, about 46.7% had similar experiences in high income economies. According to Demirguc-Kunt and Klapper (2012), globally, three-quarters of the poor do not own a bank account due to factors such as cost, paper work, travel distance, and low incomes. Further, the richest 20% of adults in developing countries are three times more likely to save in a formal financial institution as the poorest 20%.

Gender differences in financial access also exist. Globally, 61.5% of all adults own an account in a formal financial institution compared to 58.1% for females. In Sub-Saharan Africa, about 34.2% of all adults have a formal account compared to 29.9% for females (Demirguc-Kunt et al., 2015). And yet, females are the most financially fragile. Narrowing the discussion down to Ghana, the Global Findex statistics for 2014 show that, despite the growth of Ghana's financial sector, financial inclusion remains a big problem. Only about 40.5% of adults aged 15 years and older do have an account; 18.6% saved in a financial institution; only 8.1% secured a loan from a formal financial institution in the past year; and just 9.8% owned a debit card.

It has been suggested that, remittances have the potential to increase access of the poor to finance and financial services and eventually promote financial and social inclusion (Stratan and Chistruga, 2012). Remittances have been found to ease capital constraints on resource challenged entrepreneurs in Egypt (McCormick and Wahba, 2001), Albania (Kiliç et al., 2007), and Mexico (Woodruff and Zenteno, 2007). Vaaler (2013) in an analysis of remittances to 50 developing countries found that remittance is a more trustworthy venture capital funding source in developing countries than other foreign investments. There are several reasons why we should expect a link between remittances and financial inclusion. First, a good number of households with formal accounts receive remittances through formal channels. According to the Global Findex, in 2011, with the exception of East Asia and Pacific, more people in SSA reported receiving or sending remittances through formal accounts than any region of the world. About 38% of adults owning a formal account used it to receive remittances in the past year. Second, banks may view regular receipt of remittances as reliable income (Ratha, 2006) and may open more financial opportunities to recipients. Third, remittances might increase the demand for savings and loans products (Anzoategui, Demirgüç-Kunt and Peria, 2014). The flip side is that remittances may ameliorate capital constraints (Chami and Fullenkamp, 2012) and for that matter reduce the demand of recipients for financial services (Anzoategui, Demirgüç-Kunt and Peria, 2014).

This potential double-edged impact of remittances on financial inclusion has largely eluded the attention of development economist. Most of the studies which have looked at the remittance-finance nexus have focused on the impact of remittances on financial development using measures of financial depth (see Giuliano and Ruiz-Arranz, 2009; Aggarwal et al. 2011; Demirgüç-Kunt et al., 2011; Ramirez, 2013; Brown et al., 2013). The problem here is that a country may have a high credit to gross domestic product ratio (high financial depth) and high financial exclusion at the same if the credit is concentrated around a few big firms and a few wealthy people (Demirgüç-Kunt and Klapper, 2012). Thus, large credit to the private sector in the economy may not necessarily translate into the widespread use of financial services.

To the best of the authors' knowledge few studies (see Anzoategui, Demirgüç-Kunt and Peria, 2014; Aga and Peria, 2014; Ambrosius and Cuecuecha, 2016) have examined the link between remittances and financial inclusion using measures of financial inclusion such as ownership of deposit accounts, savings, loan application, and acquisition of loans. The current study joins the above and extends the scope of financial inclusion to include insurance services. This study will thus help bridge the knowledge gap on the impact of migrant remittances on financial inclusion and also provide a basis for formulating or fine-tuning policy to enhance access of the poor to affordable and reliable financial services.

We contribute to the nascent financial inclusion literature by investigating the effect of remittances on four cardinal components of financial inclusion: bank account ownership, savings, access to credit and insurance subscription. Most previous studies often deal with two financial inclusion components at a time. Second, as far as we can tell, this is the first study that links remittances to formal insurance services, especially in a developing country context. Third, we apply a rigorous econometric approach which effectively resolves the twin problems of selectivity and simultaneity which have plagued most studies on remittances and financial inclusion. Studies on insurance properties of remittances often deal with how households use remittances to overcome shock associated with rainfall or fluctuations in income and consumption, and not how households use remittances to purchase formal insurance products which enhance financial inclusion.

Fourth, we are yet to come across a study on financial inclusion which highlights the role of remittances within the Ghanaian context. The Ghanaian context makes an interesting study for a number of reasons. First, studies on remittances based on Ghana often concentrate on its impact on schooling, poverty, consumption and expenditure patterns (see Castaldo, Deshingkar and McKay, 2012; Adams and Cuecuecha, 2013). While such contributions are worthwhile they do not shed light on how remittances can be leveraged to improve the very low financial inclusion situation in that country. Second, studies on remittance and financial inclusion often draw from Latin American country (Mexico and El Salvador) experiences while the one based on African countries by Aga and Peria (2014) excluded Ghana from the sample. The financial inclusion and migrant profiles of Ghanaian households differ from those of Latin American countries and those of other countries and for that matter studies done elsewhere may not directly apply to the Ghana case. For instance, according to Demirguc-Kunt et al. (2015), the number of adults with an account in Ghana is 40.5%, the average is 34.2% for SSA and 54.2% for Latin America and the Caribbean (LAC) in 2014. Again, the number of adults who received remittances in Ghana was 36.9% and 37.2% and 11.3% respectively for SSA and LAC.

The rest of the paper is structured as follows. Section two presents a review of the theoretical and empirical literature. Section three describes the empirical strategy while section four presents analysis of the results. Section five concludes the study.

2. REVIEW OF RELEVANT LITERATURE

2.1 Theoretical background

The motives deriving remittances were first publicized by Lucas and Stark (1985). The authors advanced three motives behind migrant remittances: Pure Altruism, Pure Self-Interest and Enlightened Self-Interest. The Altruistic theory is based on the consideration that the migrant feels obliged to remit to the family back home as a result of love and affection he/she has for the family members who have been left behind. This is motivated by the poverty condition back home. Thus altruistic migrants, because of the care and concern they have towards their families, send money back home especially in trying times to help them smooth consumption. The authors categorised Pure Self-Interest into three. The first is the ambition to inherit. It works under the notion that inheritance is predicated on behaviour. Therefore, a migrant's motives for supporting his or her family, and particularly parents may entail the need to maintain and foster favour in the line of inheritance. In this manner, the migrant will be motivated to send more remittances in order to cement his/her place in inheritance. A second self-interest motive could be for the migrant to send remittance in order to invest in assets that build value in the hometown. In this situation the family back home becomes a dependable agent in investing the money on behalf of the migrant. The third self-interest motive is the aspiration on the part of the migrant to build social assets if he/she has the intention to return home. In such a case the migrant remits for investment in fixed capital such as land, livestock, or a house, or invest in public assets to gain prestige or gather political clout.

The Enlightened Self-Interest postulates that migrants whose education were sponsored by family members or philanthropists or community members send remittances home as a way of paying back whatever amount was spent on their education. Again, within the context of rural-urban migration, the risks of crop failure, price instabilities, land tenure problems, livestock diseases, and low agricultural wage may force a household to spread its risks by allocating some members to urban migration. Such an arrangement is viewed as mutually valuable to both migrant and family to enter a coinsurance contract. Remittances as claims would then flow to the family in times of crop failure and to the migrant during spells of unemployment.

Remittances will show different associations with home country living conditions depending upon the motive for sending remittances. Remittances that are motivated by altruism tend to be inversely related to home country living conditions such that more remittances are sent in bad times. This is the countercyclical view of remittances. On the other hand, remittances that are motivated by self interest considerations are mostly positively correlated with good conditions in the home country (Lim and Morshed, 2015). This is the procyclical view of remittances. In this study, it is our view that regardless of the motive for remitting, financial inclusion outcomes of remittances will not change that much.

2.2 The empirical literature

Not until recently, development research has ignored the link between migration and financial inclusion.

The bulk of the literature had tended to focus on the effect of remittances on consumption, poverty, education, women empowerment, inequality and related micro level variables. At the macro level, studies traditionally focused on the relationship between remittances and economic growth, financial development and institutions.

This has led to a significant knowledge gap in our understanding of how migration affects access to and usage of a wide range of financial services and products by those left behind. There are several reasons why an investigation into the remittance-financial inclusion is necessary. From the theoretical standpoint, investigating the link will throw more light on the mechanisms through which the motivations for sending remittances are actualised. With one of the functions of remittance being insurance, it is hard to effectively study the impact of remittances on household coping strategy without first investigating the mechanism through which this is occasioned. And financial inclusion is a major mechanism for household insurance. Further, with investment being a key motivation for sending remittances, the role of financial inclusion in this transmission process is undeniable, yet the extant literature has not adequately dealt with this financial inclusion channel of remittances. Again, if it is found that remittances improve financial inclusion it can provide the basis for local government authorities, financial institutions and central governments to reform public policy in ways that will increase the effectiveness of remittances transfers. It will also provide a more balanced view of migration in an era where migrants are subjected to inhuman treatment sometimes in their own countries and more so outside their country of origin.

Though the relationship needs more investigations, the few contributions in the area include Aga and Peria (2014), Anzoategui, Demigurc-Kunt and Peria (2014) and Ambrosius and Cuecuecha (2016). Based on World Bank survey, data covering about 10,000 households in five countries (Burkina Faso, Kenya, Nigeria, Senegal, and Uganda) in Sub Saharan Africa (SSA), Aga and Peria (2014) investigate the effect of international remittances on probability of bank account ownership. The study finds that international remittances increase the probability of receiving households opening a bank account.

Anzoategui, Demigurc-Kunt and Peria (2014) employ household level survey data on El Salvador to examine the effects of remittances on account ownership and credit instruments. The results show that remittance robustly promote accounts ownership but does not significantly promote access to and usage of formal credit. The authors explain that remittances soften credit constraints and for that matter reduce the need for external finance, while increasing the demand for savings.

In a similar study, Ambrosius and Cuecuecha (2016) investigate the impact of remittances on formal and informal financial services using Mexican data. The authors find that remittances positively affect ownership of savings account, existence of debt and recent borrowing. The authors observed that the impact of remittances on debt was on informal borrowing, while the impact on savings was on saving with formal financial institutions. The explanation is that informal lenders are willing to lend to remittance recipients against expected remittances, while formal financial service providers are only able to meet the savings needs of remittance recipients.

The work of Brown et al. (2013) refutes the claim that remittances promote account ownership and financial deepening. Based on their macro level data, they find that remittances hamper financial depending in developing countries. A micro level analysis based on a survey data for Azerbaijan and Kyrgyzstan reveals mixed results. While remittances shows a positive but weak relationship with account ownership in Kyrgyzstan, a perverse relationship is found between remittances and account ownership in Azerbaijan.

The authors find that remittances do not increase the probability of a household opening a bank account but rather recipient households tend to prefer informal channels due to dreary paper work, high cost and bureaucratic tendencies associated with bank transactions. Eventually, the authors could not confirm the hypothesis that households receiving remittance are likely to be more financially literate than comparable non recipient households.

The above discussion points to the fact that even the limited research on financial inclusion and remittances have not produced consistent results. The results seem to be context specific further justifying the need for a case study on Ghana. Though insurance is the prime motive for remittances, so far, the literature has ignored the insurance dimension of financial inclusion and the role of remittances thereof. This study contributes to the literature by exploring the implications of remittance inflows for financial inclusion instruments such as account ownership, savings, credit and insurance, using Ghana as a case study.

3. EMPIRICAL STRATEGY

3.1 Eonometric model

The model estimates the problem of a household's receipt of remittances or otherwise and its propensity to be financially included as follows. The treatment is whether the household receives remittance or not and the outcome is whether the household is financially included or not:

$$Remittance_i = \alpha + \tau Z_i + \mu_i \quad (1)$$

$$Inclusion_i = \beta + \gamma X_i + e_i \quad (2)$$

Equation (1) is the remittance equation while equation (2) is the financial inclusion equation. Z is a vector of exogenous variables that influence remittances and X is a vector of exogenous variables influencing financial inclusion. α, β, τ and γ are estimable parameters while μ and e are error terms. The two equations are discreet models and we could estimate them using either probit or logit. However, we are faced with two major econometric issues which cannot be handled by the usual probit or logit: sample selection bias and endogeneity. We are faced with the challenge that the group that did not receive remittances may not be comparable with the group that received remittances. This non comparability can lead to a distortion in our estimation of the effects of remittances on financial inclusion. This problem is mostly referred to as sample selection bias. There are two main categories of selection bias: selection on observables and selection on unobservables. Selection on observables refers to differences in background characteristics measured by the study between those who received the treatment and those untreated. For instance, those who received remittances might differ from those who did not receive remittances in terms of variables like age, sex, educational status and employment which have been captured by this study. Our inability to control for these observed characteristics will lead to downward or upward bias in the estimated effects of remittances.

We are further faced with the possibility that unobserved characteristics could also lead to the non-comparability of the remittance receiving group and the untreated group. This is the problem of selection on unobservables. Selection on unobservables can arise in a number of ways in our model. For instance, there could be the possibility that households that did not receive remittances from the onset had a higher level of financial literacy, which could cause them to be financially included. It may also be the case that households receiving remittances have members who are more skilled, capable, or endeavouring than non-receiving households. Without correcting for these unobservables, our estimations may yield biased results.

The second major problem we face is simultaneity between financial inclusion and remittances. It might be that it is financial inclusion that drives migration or also that migration and associated remittances cause households to use financial services. It could also be the case that certain households seeing their lack of financial inclusion may deliberately push some of their members to migrate in anticipation of future benefits of financial inclusion. This will therefore make remittances endogenous. The problem of endogeneity exists because choices that cause households not to be financially included may be correlated to their choice of whether or not to receive remittances. Furthermore, household remittance decisions are made in the presence of substantial unobserved heterogeneity.

We address the selection and endogeneity problems by using endogenous switching probit regressions (ESPR). We use the *switch_probit* command in stata developed by Lokshin and Sajaia (2011), which implements Maximum likelihood estimation of binary choice models with binary endogenous variables. According to Lokshin and Sajaia (2011), the ESPR is more efficient than binary probit (biprobit) and Heckman treatment effect models. In addition, the binary probit regression is restrictive in that it assumes the same coefficients for the outcome variable in both regimes of the treatment. Again, the processes involved in deriving consistent standard errors for these approaches are nontrivial. On the contrary, the endogenous switching probit uses a full information maximum likelihood procedure to simultaneously estimate the binary selection and the binary outcome sections of the model to produce efficient estimates and consistent standard errors. Also, the ESPR allows the coefficients of financial inclusion determinants to vary depending on whether the household received remittance or not. The ESPR is also superior to the popular propensity score matching and treatment effect models in that the ESPR controls for both observables and nonobservable factors while the others only deal with observables. A key assumption of the ESPR is that of joint normality in errors of the selection and outcome equations.

Another assumption underlying the ESPR is that there is a switch in the financial inclusion model such that households are ordered into regimes of financial inclusion based on those who received remittances and those who did not. It is also assumed that endogeneity exist between remittances and financial inclusion such that unobserved factors that affect remittances receipts also affect financial inclusion. Based on these assumptions, we can specify an endogenous switching regression for the two regimes of financial inclusion a household may be categorised:

Regime 1: $Inclusion_{1i} = \gamma_1 X_{1i} + e_{1i}$ if $\tau Z_i + \mu_i > 0$ (3)

Regime 2: $Inclusion_{2i} = \gamma_2 X_{2i} + e_{2i}$ if $\tau Z_i + \mu_i \leq 0$ (4)

$$\begin{cases} Remittance_i = 1 \text{ if } \tau Z_i + \mu_i > 0 \\ Remittance_i = 0 \text{ if } \tau Z_i + \mu_i \leq 0 \end{cases} \quad (5)$$

Equation (3) denotes the financial inclusion regime of a household given that the household receives remittances. Equation (4) defines the financial inclusion regime of a household given that the household does not receive remittances. X_{1i} and X_{2i} are vectors of weakly exogenous variables. Z is a vector of exogenous variables that determines a switch between regimes. τ's and γ's are parameters to be estimated. The error terms μ_i, e_{1i}, e_{2i} are assumed to be jointly normally distributed with zero mean and a covariance matrix of the following structure:

$$\vartheta = \begin{pmatrix} 1 & \rho 0 & \rho 1 \\ & 1 & \rho 10 \\ & & 1 \end{pmatrix}$$

where $\rho 0$ and $\rho 1$ are the correlations between e_{2i} , μ and e_{1i}, μ, and $\rho 10$ is the correlation between e_{2i} and e_{1i}. Since the same household cannot be financially included and excluded at the same time we cannot estimate $\rho 10$ because the joint distribution (e_{1i}, e_{1i}) is not identified. Following Lokshin and Z. Sajaia (2011), we assume that $\rho 10 = 1$ since τ is estimable only up to a certain scalar factor. The log likelihood function for simultaneous equations (3)-(5) is given by:

$$lnL = \sum_{T_i \neq 0, FI_i \neq 0} w_i ln\{\emptyset_2(X_{1i}\gamma_1, Z_i\tau, \rho 1)\} + \sum_{T_i \neq 0, FI_i = 0} w_i ln\{\emptyset_2(-X_{1i}\gamma_1, Z_i\tau, -\rho 1)\}$$
$$+ \sum_{T_i = 0, FI_i \neq 0} w_i ln\{\emptyset_2(X_{2i}\gamma_2, -Z_i\tau, -\rho 0)\}$$
$$+ \sum_{T_i = 0, FI_i = 0} w_i ln\{\emptyset_2(-X_{2i}\gamma_2, Z_i\tau, \rho 0)\}$$

T_i denotes the treatment (remittance status), FI_i denotes financial inclusion. $\emptyset_2$ is the cumulative function of a bivariate normal distribution and w_i is an optional weight for observation i. After estimating equations (3)-(5) simultaneously using the *switch_probit* command in stata by Lokshin and Sajaia (2011) we can estimate the following statistics:

Effect of Treatment on the Treated (TT): The effect of the treatment (remittances) on the treated (those who received remittances), or the expected effect of remittances on households with observed characteristics x who actually received remittances:

$$TT(x) = \Pr(Inclusion_{i1} = 1 | Remittance_i = 1, X = x) - \Pr(Inclusion_{i2} = 1 | Remittance_i = 1, X = x)$$

$$= \frac{\emptyset_2(X_{1i}\gamma_1, Z_i\tau, \rho 1) - \emptyset_2(X_{2i}\gamma_2, Z_i\tau, \rho 0)}{F(Z_i\tau)}$$

F represents a cumulative function from the univariate normal distribution.

Effect of the Treatment on the Untreated (TU): This is the expected impact of the treatment (remittances) on individuals with observed attributes x who did not receive the treatment. That is, the expected effect of remittances on the financial inclusion status of households who did not receive remittances:

$$TU(x) = \Pr(Inclusion_{i1} = 1 | Remittance_i = 0, X = x) - \Pr(Inclusion_{i2} = 1 | Remittance_i = 0, X = x)$$

$$= \frac{\emptyset_2(X_{1i}\gamma_1 - Z_i\tau - \rho 1) - \emptyset_2(X_{2i}\gamma_2 - Z_i\tau - \rho 0)}{F(-Z_i\tau)}$$

Treatment Effect (TE): this is the expected effect of the treatment (remittances) on the individual with observed characteristics x selected randomly from the population. That is, the effect of remittances on financial inclusion for a randomly selected household:

$$TE(x) = \Pr(Remittance_i = 1, X = x) - \Pr(Remittance_i = 0, X = x) = F(X_{1i}\gamma_1) - F(X_{2i}\gamma_2)$$

We can compute the Average Treatment on the Treated (ATT), the Average Treatment on the Untreated (ATU) and the Average Treatment Effect (ATE) by averaging equations (3) through (5) over the subgroup observations. For instance, the ATT, which is the average effect of

remittances on the financial inclusion of households who actually received remittances is computed as:

$$ATT = \frac{1}{n_T}\sum_{i=1}^{n_T} TT(x_i)$$

Where n_T is the number of households that received remittances (that is, T=1).

3.2 Data

The data for this study is from the Ghana Living Standard Survey round 6 (GLSS 6) conducted in 2012/13 by the Ghana Statistical Service (GSS). The GLSS is a nationally representative survey of 16,772 households in 1,200 enumeration areas. The survey covers a wide range of issues bordering on household's living conditions such as health, education, housing, sanitation, expenditure, employment, migration and tourism, agriculture, nonfarm enterprises, access to financial services, household assets, and governance, peace and security. In order to reduce the distortionary impact of outliers, we dropped all remittance observations above the 98% percentile. Consequently, 173 observations were dropped. This left us with a total sample of 16,599 households.

Since the focus is on remittances we take some time to discuss its measurement. Remittances come both in cash and in kind in the form of goods. Though greater part of remittance is in cash its measurement will be enhanced if we add the goods component. The goods component is categorised into food and non food items. The non-food items often remitted include stove, building material, refrigerators, and electronic appliances such as TVs, mobile phones and radio sets. GSS computes the money value of the goods received and adds it to the cash remittances to derive the total remittances received by the household. In this study, remittance is measured as a dummy variable, which is equal to 1 if the household received remittances and 0 if otherwise. Our measure of remittances includes both internal and international remittances since we are interested in assessing the impact of any form of remittances on financial inclusion.

Financial inclusion is proxied by four main dummy variables namely, ownership of bank account which takes the value 1 if household has a bank account with a formal financial institution and 0 if otherwise, savings which takes the value 1 if household has a savings account with a formal financial institution and 0 if otherwise, access to credit which takes the value 1 if household applied for formal credit in the past 12 months and 0 if otherwise, and insurance which takes the value 1 if household holds an insurance policy and 0 if otherwise. The variables used in the model and their definitions and measurements are reported in table 1.

Table 1: Variables, definitions and measurements

Variable	Definition	Measurement
Remittance Variable		
REMITTANCE	Receipt of remittances by a household either in cash or in kind	1= if yes; 0=otherwise
REMITTANCE1	Amount of per capita remittances received by households per annum	Ghana cedis
Financial Inclusion Variables		
ACCOUNT	Ownership of bank account	1= if yes; 0=otherwise
SAVINGS	Having savings account in a formal financial institution	1= if yes; 0=otherwise
CREDIT	Application for loan in the past 12 months	1= if yes; 0=otherwise
INSURANCE	Ownership of insurance policy	1= if yes; 0=otherwise
Household Characteristics		
AGE	Age of household head	Years
SEX	Gender of household head	1= if male; 0=otherwise
EDUCATION	Household head's educational attainment	Years of schooling
EMPLOYMENT	Employment type of household head	1= if salary or wage worker; 0=otherwise
LOCATION	Locality of household	1= if rural; 0=otherwise
HHSIZE	Household size	Number of persons
LANDSIZE	Land size owned by household	Hectares
Household welfare variables		
NONPOOR	Poor or non-poor status	1=if non-poor; 0= if poor
LIVING CON	Improvements in living conditions of household	1= if yes; 0=otherwise
PHONE	Ownership of at least one mobile phone	1= if yes; 0=otherwise
Community Infrastructure		
ROAD	There is motorable road to community	1= if yes; 0=otherwise
BANK	Nearest bank to community	Kilometres
MARKET	Permanent daily community market	1= if yes; 0=otherwise
TRANSPORT	Public transport pass through community	1= if yes; 0=otherwise
ELECTRICITY	Community has electricity	1= if yes; 0=otherwise
POST OFFICE	Distance to nearest post office	Kilometres

4. RESULTS AND DISCUSSION

4.1 Descriptive statistics

Table 2 reports the descriptive statistics for the variables used in the study. The average amount of remittance received per capita is GHS 74 per annum. This amount is expected to supplement the earnings of the household and to help meet some household expenses. Only 33.16% of our sample households received remittances, while the remaining 66.84% did not receive any remittance over the period. In terms of the financial inclusion indicators, 41.78% of households have bank account, 26.31% save with financial institutions, 8.99% have access to credit and 25.95% have subscribed to an insurance policy. These statistics underscore the low penetration of financial products and services among Ghanaian households. In particular, access to credit has been a debilitating problem for entrepreneurs and businesses and has constrained the growth of enterprises.

In terms of household demography, the average household is headed by a middle aged (46 years) male (71.97%); is located in a rural area (55.99%); has minimal education (an average of 6 years of schooling); and is populated by about 4 people. In terms of household welfare, majority of households are non-poor (75.83%), with an average real annual household expenditure of GHS 1093.887. in terms of changes in household living conditions, 62.87 experienced an improvement in the period leading up to the survey while the remaining experienced no change or a worsening of living conditions.

Households have reasonable access to mobile phone (76.25%), transport (58.36%), infrastructure and amenities such as road network (76.93%). On the other hand, very few households have a post office (1.20%) and market (3.40%) in their vicinity. The average distance between a household and the nearest bank is approximately 15km which highlights the constrained access to financial services by households.

Table 2: Summary statistics

Variable	Mean	Median	Standard Deviation	Min	Max
REMITTANCE1 (amount)	73.503	0.000	214.715	0.000	1780.000
AGE	45.843	43.000	15.840	15.000	98.000
HHSIZE	4.291	4.000	2.783	1.000	29.000
EDUCATION	6.403	8.000	5.369	0.000	19.000
LANDSIZE	1.440	0.000	8.171	0.000	774.585
BANK	14.998	15.000	12.583	0.000	127.000

Categorical variables

Variable	Percentage (Yes)
REMITTANCE	33.16
NON POOR	75.83
PHONE	76.25
ACCOUNT	41.78
SAVINGS	26.31
CREDIT	8.99
INSURANCE	25.95
HHSEX	71.97
LOCATION	55.99
EMPLOYMENT	23.28
ROAD	76.93
MARKET	3.40
TRANSPORT	58.36
POST OFFICE	1.20
LIVING CON	62.87

Remittance is measured by two variables: REMITTANCE1 is the amount of remittance per capita received by household per annum, REMITTANCE is a dummy variable which is labelled 1 if household received remittances and 0 otherwise. Note that REMITTANCE is the measure used in estimating the models, while REMMITANCE1 is used mainly to show per capita remittances received by households. PHONE is labelled 1 if household owns at least one mobile phone and 0 otherwise, Financial inclusion is measured by four variables: account ownership (ACCOUNT) which takes the value 1 if household owns account and 0 otherwise, savings ability (SAVINGS) which takes the value 1 if household has a savings account and 0 otherwise, access to credit (CREDIT) which takes the value 1 if household has access to credit and 0 otherwise, and insurance penetration (INSURANCE) which is labelled 1 if household has insurance policy and 0 otherwise. EDUCATION is number of years of schooling by household head, AGE is age of household head, SEX is gender of household head labelled 1 if male and 0 otherwise, LOCATION is location of household labelled 1 if rural and 0 if urban, HHSIZE is household size, EMPLOYMENT is employment type which is labelled 1 if household head is a salaried worker and 0 otherwise, LANDSIZE is hectares of land owned by household, BANK is distance to the nearest commercial bank in km, POST OFFICE is distance to the nearest post office in km, ROAD is motorable road and labelled 1 if community has motorable road and 0 otherwise, MARKET is daily community marked with label 1 if community has a daily market and 0 otherwise, TRANSPORT is public transport with value 1 if public transport passes through community and 0 otherwise.

4.2 Discussion of results

Table 3 shows the determinants of remittance inflows to households as well as the factors influencing financial inclusion in terms of bank account ownership and savings separately for remittance receiving and non-receiving households. Table 4 reports the drivers of remittance inflows to households and the factors influencing financial inclusion in terms of access to credit and insurance separately for remittance receiving and non-receiving households. Remittances is the selection (treatment) variable, while the measures of financial inclusion are the outcome variables. The Wald test of model validity all show that the models are well specified and adequately explain the phenomenon of concern. The likelihood ratio test of independence of equations, except for one case (the credit model), all show that the equations are highly dependent and should thus be estimated in the simultaneous manner we have done in order to obtain unbiased estimates. These model diagnostics generally mean that the models are valid and capable of producing accurate estimates and reliable predictions.

4.2.1 Who are the recipients of remittances?

The objective of this subsection is to describe the characteristics of households that receive remittances. The altruistic theory of remittances suggests that vulnerable households are more likely to receive remittances. This is to cushion them from the shocks of life and to help in consumption smoothening. Results in table 3 and in table 4 with column labels 'Equation 1' show the factors that drive internal remittance flows to households.

Having a mobile phone increases the probability of a household receiving remittances. This is seen in the positive and significant coefficient of remittances in all four panels. This is because mobile phone is an important medium through which remittances are transmitted. It provides not only the means by which migrants bond with their family back home but also serves as the tool through which monies are transferred. Constant communication is important in the remittance link, and the popularisation of mobile data and voice subscription and the spread of mobile money facilitate this.

In terms of the household demography variables, age is positively correlated with remittances while gender shows a negative relationship in all four panels. This means that older household heads and female headed households are more likely to receive remittances. This result is plausible because female headed households and the aged are among the most vulnerable in the society. Female heads are mostly widows who are either aged and or unemployed or engaged in a less productive enterprise. The aged are often too feeble to farm or engaged in works that require the exertion of physical effort. Such households often rely on relatives, neighbours and migrants for survival. Location shows positive and significant results in all four models implying that rural households are more likely to receive remittances. This is plausible because rural areas are the most deprived and are also major sources of migrants especially in the rural-urban migration phenomenon. Households whose livelihood improved in the year leading up to the survey are less probable to receive remittances. This is clear in the consistently negative and significant coefficient of living conditions (LIVING CON) in all four scenarios. This confirms the fact that the remittances are targeted at poor and vulnerable households.

The community variables show that BANK is significant in all four situations and has a negative sign. This means that households that are distant from financial institutions are less likely to receive remittances. This may be explained by the fact that remittances are sometimes sent through banks and other financial institutions, and the farther a household is from a bank, the less likely they will use it as a channel for receiving remittances. Availability of public transport in community shows a negative and significant coefficient throughout showing that impassable communities receive more remittances than more accessible communities.

Put together, the results lead to the conclusion that remittances are mostly targeted at households that are most vulnerable: those headed by the aged and or a female, those without a current account and those without access to credit, and those who have had their living conditions stagnating or worsening.

Table 3: Drivers of remittances and financial inclusion (Accounts and Savings)

	Panel A			Panel B		
	Equation 1: Selection into Remittances	Equation 2: Ownership of Account	Equation 3: Ownership of Account	Equation 1: Selection into Remittances	Equation 2: Ability to Save	Equation 3: Ability to Save
Variables		Remittance recipients	Non recipients		Remittance recipients	Non recipients
PHONE	0.1963***	0.5698***	0.6100***	0.1954***	0.6142***	0.4612***
	(0.0264)	(0.0411)	(0.0389)	(0.0264)	(0.0652)	(0.0411)
AGE	0.0117***	0.0069***	0.0003	0.0119***	0.0026	0.0056***
	(0.0007)	(0.0009)	(0.0019)	(0.0007)	(0.0038)	(0.0013)
LOCATION	0.1442***	-0.0710**	-0.3986***	0.1476***	-0.2548***	-0.1819***
	(0.0229)	(0.0342)	(0.0399)	(0.0228)	(0.0787)	(0.0380)
HHSIZE	-0.0162***	0.0016	0.0240***	-0.0171***	-0.0015	0.0035
	(0.0040)	(0.0054)	(0.0060)	(0.0040)	(0.0093)	(0.0051)
EDUCATION	0.0020	0.0586***	0.0883***	0.0027	0.0713***	0.0492***
	(0.0023)	(0.0039)	(0.0034)	(0.0022)	(0.0059)	(0.0047)
EMPLOYMENT		0.2185***	0.4031***		0.3433***	0.2021***
		(0.0399)	(0.0343)		(0.0595)	(0.0267)
SEX	-0.4716***	-0.2723***	0.0655	-0.4728***	0.1631	-0.1117**
	(0.0236)	(0.0343)	(0.0740)	(0.0237)	(0.1660)	(0.0509)
LANDSIZE	-0.0008	0.0016	0.0070**	-0.0013	0.0050	0.0018
	(0.0014)	(0.0027)	(0.0028)	(0.0015)	(0.0046)	(0.0016)
ROAD		-0.0396	0.2292***		0.0131	0.0915**
		(0.0407)	(0.0483)		(0.0682)	(0.0387)
BANK	-0.0026***	-0.0012	-0.0031**	-0.0024***	0.0015	-0.0021*
	(0.0009)	(0.0013)	(0.0014)	(0.0009)	(0.0023)	(0.0012)
MARKET	-0.0687	0.0295	-0.0337	-0.0652	0.0874	-0.1396*
	(0.0637)	(0.0829)	(0.0799)	(0.0635)	(0.1249)	(0.0715)
TRANSPORT	-0.0734***	0.1466***	0.1246***	-0.0798***	0.1020*	0.0476
	(0.0239)	(0.0377)	(0.0388)	(0.0238)	(0.0602)	(0.0329)
POST OFFICE	0.0240	-0.3155**	-0.0408	0.0070	-0.4312*	0.0707
	(0.1050)	(0.1459)	(0.1358)	(0.1050)	(0.2328)	(0.1191)
LIVING CON	-0.0576***			-0.0631***		
	(0.0187)			(0.0197)		
Constant	-0.7016***	-2.1580***	-1.4801***	-0.7086***	-2.1746***	-1.0262***
	(0.0556)	(0.0799)	(0.1549)	(0.0556)	(0.4685)	(0.1336)
Model Diagnostics						
Observations	16,599	16,599	16,599	16,599	16,599	16,599
Rho		0.9443***	0.1612		0.2229	0.8458***
		(0.1626)	(0.2397)		(0.4489)	(0.0674)
LR test		14.28***			6.96**	
Wald Chi2		888.84***			909.97***	
Log like.		-18659.587			-18060.887	

Table 3 presents results of endogenous switching probit estimates with remittances as the selection variable and financial inclusion (Account and Savings) as outcome variable. Account ownership is the outcome variable in Panel A while Panel B has Savings as the outcome variable. The results are presented separately for remittance recipients and non recipients. REMITTANCE is a dummy variable and is labelled 1 if household received remittances and 0 otherwise, financial inclusion is measured by account ownership (ACCOUNT) which takes the value 1 if household owns account and 0 otherwise, and savings ability (SAVINGS) which takes the value 1 if household has a savings account and 0 otherwise. PHONE is labelled 1 if household owns at least one mobile phone and 0 otherwise. EDUCATION is number of years of schooling by household head, AGE is age of household head, SEX is gender of household head labelled 1 if male and 0 otherwise, LOCATION is location of household labelled 1 if rural and 0 if urban, HHSIZE is household size, EMPLOYMENT is employment type which is labelled 1 if household head is a salaried worker and 0 otherwise, LANDSIZE is hectares of land owned by household, BANK is distance to the nearest commercial bank in km, POST OFFICE is distance to the nearest post office in km, ROAD is

motorable road and labelled 1 if community has motorable road and zero otherwise, MARKET is daily community marked with label 1 if community has a daily market and 0 otherwise, TRANSPORT is public transport with value 1 if public transport passes through community and 0 otherwise. The model diagnostics are (1) rho which measures correlations of the error terms between equations, (2) Wald test which shows joint significance of model coefficients, (3) Likelihood ratio test of independence of equations, which shows dependence of equations. Log likelihood which shows model validity. *, **, *** show significance at 10%, 5% and 1% respectively. Standard errors are in parenthesis.

Table 4: Drivers of remittances and financial inclusion (Credit and Insurance)

	Panel C			Panel D		
	Equation 1: Selection into Remittances	Equation 2: Access to Credit	Equation 3: Access to Credit	Equation 1: Selection into Remittances	Equation 2: Having Insurance Policy	Equation 3: Having Insurance Policy
Variables		Remittance recipients	Non recipients		Remittance recipients	Non recipients
PHONE	0.1977***	0.2550***	0.2146***	0.193***	0.0241	0.101***
	(0.0265)	(0.0907)	(0.0601)	(0.0263)	(0.0520)	(0.0345)
AGE	0.0120***	-0.0067	-0.0022	0.0118***	-0.000488	0.00450***
	(0.0007)	(0.0045)	(0.0019)	(0.000672)	(0.00214)	(0.000898)
LOCATION	0.1489***	0.1539**	0.1437***	0.148***	-0.331***	-0.197***
	(0.0229)	(0.0701)	(0.0480)	(0.0228)	(0.0365)	(0.0275)
HHSIZE	-0.0170***	0.0370***	0.0352***	-0.0168***	0.0156***	0.0188***
	(0.0040)	(0.0109)	(0.0066)	(0.00398)	(0.00555)	(0.00486)
EDUCATION	0.0027	0.0120**	0.0327***	0.00336	0.0266***	0.0475***
	(0.0023)	(0.0052)	(0.0046)	(0.00226)	(0.00555)	(0.00274)
EMPLOYMENT		0.1191*	0.0406		0.335***	0.356***
		(0.0632)	(0.0431)		(0.0588)	(0.0276)
SEX	-0.4753***	-0.1856	-0.1058	-0.468***	0.180***	0.0738**
	(0.0237)	(0.1697)	(0.0853)	(0.0235)	(0.0606)	(0.0295)
LANDSIZE	-0.0010	0.0129***	0.0007	-0.000644	0.00122	0.00169
	(0.0013)	(0.0040)	(0.0015)	(0.00127)	(0.00273)	(0.00132)
ROAD		-0.1123	0.2964***		0.0524	0.327***
		(0.0757)	(0.0642)		(0.0403)	(0.0448)
BANK	-0.0024***	0.0035	0.0042**	-0.00227**	0.00211	-2.18e-05
	(0.0009)	(0.0025)	(0.0017)	(0.000924)	(0.00136)	(0.00127)
MARKET	-0.0652	-0.1611	0.1447	-0.0661	0.113	0.0704
	(0.0637)	(0.1480)	(0.0956)	(0.0633)	(0.0845)	(0.0722)
TRANSPORT	-0.0769***	0.2053***	0.0926**	-0.0802***	0.0775**	0.125***
	(0.0240)	(0.0664)	(0.0462)	(0.0239)	(0.0355)	(0.0334)
POST OFFICE	0.0053	0.2384	-0.1542	0.0121	-0.00297	-0.183
	(0.1053)	(0.2150)	(0.1756)	(0.105)	(0.139)	(0.133)
LIVING CON	-0.0642***			-0.0911***		
	(0.0220)			(0.0182)		
Constant	-0.7154***	-1.4688**	-2.4592***	-0.694***	0.164	-2.127***
	(0.0563)	(0.6461)	(0.1098)	(0.0554)	(0.237)	(0.0775)
Model Diagnostics						
Observations	16,599	16,599	16,599	16,599	16,599	16,599
Rho		0.0543	-0.5703		-0.8569***	-0.9653***
		(0.5010)	(0.4238)		(0.0755)	(0.0425)
LR test		0.85			25.86***	
Wald Chi2		909.97***			928.06***	
Log like.		-14872.255			-18425.249	

Table 4 presents results of endogenous switching probit estimates with remittances as the selection variable and financial inclusion (Credit and Insurance) as outcome variable. Access to credit is the outcome variable in Panel C while Panel D has Insurance as the outcome variable. The results are presented separately for

remittance recipients and non recipients. REMITTANCE is a dummy variable and is labelled 1 if household received remittances and 0 otherwise, financial inclusion is measured by access to credit (CREDIT) which takes the value 1 if household has access to credit and 0 otherwise, and insurance penetration (INSURANCE) which is labelled 1 if household has insurance policy and 0 otherwise. PHONE is labelled 1 if household owns at least one mobile phone and 0 otherwise. EDUCATION is number of years of schooling by household head, AGE is age of household head, SEX is gender of household head labelled 1 if male and 0 otherwise, LOCATION is location of household labelled 1 if rural and 0 if urban, HHSIZE is household size, EMPLOYMENT is employment type which is labelled 1 if household head is a salaried worker and 0 otherwise, LANDSIZE is hectares of land owned by household, BANK is distance to the nearest commercial bank in km, POST OFFICE is distance to the nearest post office in km, ROAD is motorable road and labelled 1 if community has motorable road and 0 otherwise, MARKET is daily community marked with label 1 if community has a daily market and 0 otherwise, TRANSPORT is public transport with value 1 if public transport passes through community and 0 otherwise. The model diagnostics are (1) rho which measures correlations of the error terms between equations, (2) Wald test which shows joint significance of model coefficients, (3) Likelihood ratio test of independence of equations, which shows dependence of equations. Log likelihood which shows model validity. *, **, *** show significance at 10%, 5% and 1% respectively. Standard errors are in parenthesis.

4.2.2 What are the drivers of financial inclusion among remittance receiving and non-receiving households?

Tables 3 shows the drivers of account ownership and savings for remittance receiving and non-receiving households. The results for account ownership are shown in Equations 2 and 3 of Panel A, while the results for savings are shown in Equations 2 and 3 of Panel B. The Equation 2s are for remittance recipients while the equation 3s are for non-recipients. Similarly, table 4 shows the drivers of access to credit and insurance participation for the two remittance regimes. The results for access to credit are shown in Equations 2 and 3 of Panel C, while the results for insurance are shown in Equations 2 and 3 of Panel D. Again, the Equation 2s are for remittance recipients while the equation 3s are for non-recipients.

The results from the four panels show that, only mobile phone ownership and educational status significantly influence all financial inclusion measures under the two regimes of remittances with the same sign. The coefficients for both variables are positive implying that owning a mobile phone and being educated increase the probability of a household obtaining access to and being able to use financial instruments such as accounts, savings, credit and insurance, regardless of whether the household receives remittances or not. There are several plausible explanations as to why mobile phones and education will promote financial inclusion. Mobile phones are means for information sharing between financial institutions and their clients. Mobile phone services include bank transfers, SMS alerts, and mobile money services. Mobile phones can also be used for internet banking, to search for various financial services providers and the associated products and services and the cost implications to enable prudent choices. Mobile money transfers are becoming preferred means of money transfers especially in the informal sector. In terms of the education variable, educated individuals often gain employment in the formal sector which requires that salaries and other payments are made through a bank account.

In addition, educated persons leverage their knowledge and exposure to seek and use various types of financial services that will ensure income security and prepare them for retirement and other eventualities of life. Location is significant in all four panels but with varying signs. The coefficients are negative for account, savings and insurance but positive for credit under both remittance regimes.

This means that rural households are less likely to have access to financial services such as bank accounts, savings and insurance compared to their urban counterparts. This is because there are fewer (if any) financial institutions in most rural areas which leads most rural inhabitant to resort to the use of informal financial services. Rural communities lack basic infrastructure and amenities required to attract infrastructure dependent institutions and services. The finding that rural households are more likely to obtain credit is however counterintuitive.

Households with large sizes are more likely to own a bank account, obtain credit and subscribe to an insurance policy largely due to their larger demand for goods and services including financial products and services. Remittance receiving households who are headed by males are less likely to open an account compared to their counterparts who also receive remittances but are headed by females. Again, non-receiving households who are headed by males are less likely to hold an insurance policy compared to their counterparts who also receive remittances but are headed by females. This is because female headed households are more vulnerable and hence are more likely to take measures that will help reduce their vulnerabilities. Females are also on the average more risk averse than males and for that matter are more likely to enter insurance contracts.

A good road network and the availability of public transport in community are shown to be important drivers of financial inclusion among households that do not receive remittance. This highlights the importance of infrastructure in promoting access to and usage of financial services. Most financial services have to be supported by transportation and telecommunication infrastructure to function effectively. Another driver of financial inclusion among households without access to remittances is proximity to bank. The results show that non receiving households distant from banks are less likely to own bank account or save in a financial institution. This underlines the importance of physical access to financial institutions in the financial inclusion campaign. A surprising result is that non receiving households which are far from a bank are more likely to obtain formal credit. This may be due to the fact that unlike remittance recipients who can rely on remittance as an alternative source of funding, non-receiving households have fewer alternatives and may be more inclined to pressure banks for loans.

4.2.3 Do remittances promote financial inclusion?

In this sub section, we discuss how remittances affect financial inclusion measures such as account ownership, savings, access to credit and insurance. Table 5 shows treatment effects results predicted from the endogenous switching probit models for the various measures of financial inclusion. These results do not suffer from selection and simultaneity biases as the ESPR has effectively handled these problems. The ATT shows the effect of remittances on financial inclusion of households that actually received remittances. ATU shows the effect of remittances on financial inclusion for households who did not receive remittances, if they had received remittances (the counterfactual). ATE shows the average effect of remittances on financial inclusion of a randomly selected household. All the treatment effect coefficients are positive and at least significant at 10% level implying that remittances are important for promoting financial inclusion.

The ATE for bank accounts shows that remittances increases the probability of a random household owning a bank account by 14 percentage points.

The ATT shows that remittance households have a 14 percentage point higher probability of having a bank account compared to comparable non-remittance receiving households. The ATU shows that households that did not receive remittances will have had a 13 percentage point higher probability of owning a bank account if they were to receive remittances. The interpretation is that households that receive remittances are more probable to own an account and that those who do not receive remittances would have increased their chances of owning an account if they were to receive. This is reasonable because bank account ownership is an important channel for the transfer and receipt of remittances. In communities without banks, migrant households travel to urban areas to receive money from banks through their accounts. The findings conflict with Brown et al. (2013) who find that remittances can reduce the demand for banking services as remitters by pass banks and provide an alternative source of funding. However, the findings are in agreement with Anzoategui, Demigurc-Kunt and Peria (2014).

Table 5: Effects of remittance on financial inclusion: Estimates of treatments effects

	Treatment effects		
Variable	ATT	ATU	ATE
ACCOUNT	0.1399*	0.1333*	0.1355*
	(0.0876)	(0.0868)	(0.0871)
SAVINGS	0.0835**	0.0841*	0.0839*
	(0.0599)	(0.0607)	(0.0604)
CREDIT	0.0417**	0.0377**	0.0390**
	(0.0197)	(0.0180)	(0.0187)
INSURANCE	0.1134*	0.0961*	0.1018*
	(0.0698)	(0.0650)	(0.0671)

Table 5 shows results of treatment effect predictions of the effect of remittances on financial inclusion. REMITTANCE which is the treatment is a dummy variable which is labelled 1 if household received remittances and 0 otherwise. Financial inclusion, the outcome, is proxied by four variables: account ownership (ACCOUNT) which takes the value 1 if household owns account and 0 otherwise, savings ability (SAVINGS) which takes the value 1 if household has a savings account and 0 otherwise, access to credit (CREDIT) which takes the value 1 if household has access to credit and 0 otherwise, and insurance penetration (INSURANCE) which is labelled 1 if household has insurance policy and 0 otherwise. ATT is average treatment on the treated, ATU is average treatment on the untreated and ATE is average treatment effect. *, **, *** show significance at 10%, 5% and 1% respectively. Standard errors are in parenthesis.

The ATE for savings shows that remittances increases the probability of a random household owning a saving account by 8.4 percentage points. The ATT shows that remittance households have 8.4 percentage point higher probability of having a savings account compared to similar non-remittance receiving households. The ATU also shows that households that did not receive remittances will have had 8.4 percentage point higher probability of saving if they were to receive remittances. This means that remittances increases the probability of a household saving with a formal financial institution for receiving households and will have had a similar effect on non-receiving households if they were to be recipients. The receipt of remittances enable households to save and build capital for investment, or save against unforeseen circumstances. Vulnerable households usually feel the impact of floods, crop failure, health emergencies, food insecurity and fire disasters more. Remittances help them build cash reserves which can help them cope better with these shocks. This finding agree with Ambrosius and Cuecuecha (2016) within the Mexican context.

The ATE for access to credit shows that remittance increases the probability of obtaining credit by 3.9 percentage points for a randomly sampled household. The ATT shows that remittance households have 4.2 percentage point higher probability of accessing credit relative to comparable non-remittance receiving households. The ATU also shows that households that did not receive remittances will have had 3.8 percentage point higher probability of accessing credit if they were to receive remittances. These results imply that remittance increases the probability of a household accessing credit from a formal financial institution for receiving households and will have had a similar effect on non-receiving households if they were to be recipients. Financial institutions take advantage to reach out to remittance recipients with a suite of financial services including credit. In some cases, banks accept expected remittance receipts as pledge against loans. The data collected by financial institutions from forms filled by remittance receiving households are used to analyse the needs of such households in order to customise financial services and products to meet these needs. These findings are at variance with Anzoategui, Demigurc-Kunt and Peria (2014) who did not find any significant effect of remittances on credit in El Salvador.

The ATE for insurance subscription shows that remittance increases the probability of a randomly sampled household holding an insurance policy by 10.2 percentage points. The ATT shows that remittance households have 11.3 percentage point higher probability of subscribing to an insurance policy compared to analogous non-remittance receiving households. The ATU also shows that households that did not receive remittances will have had 9.6 percentage point higher probability of accessing insurance if they were to receive remittances. This implies that remittance increases the probability of a household accessing insurance from a formal financial institution for receiving households and would have had a similar effect on non-receiving households if they were to be recipients. One of the major motivations driving remittance transfers is for insurance purposes. Migrant households are often provided with remittance to help them cope with shocks occasioned by health emergencies, crop failures, epidemics, disasters (drought, floods and fires), accidents and other predicaments. Households apply remittances and other funds to enter short term and long term insurance contracts. The short term insurance contracts usually entered by Ghanaian households include vehicle and motor insurance, property insurance, medical insurance, travel insurance, funeral insurance and commercial/business insurance. According to the Ghana Statistical service (2014), about 90% of individuals living in urban households have a business or commercial policy, 83.3% have property policy and 77.4% have vehicle or motor policy. The short term insurance policies popular among rural dwellers include medical (38.1%), funeral (25.7%) and vehicle or motor (22.6%). The long term insurance policies held by Ghanaian households include life insurance, education, retirement annuity/plan, and other endowment/investment/savings plan.

4.3 Do remittances promote the welfare of recipient households?

We established in the previous sub section that remittances enhance the ability of households to open account, borrow, save against emergencies and also provide a direct insurance cover against eventualities. The next issue to address is whether remittance really alleviates the sufferings of households and improves wellbeing. We present treatment effects estimates from endogenous switching probit in table 5 showing the effect of remittances on household poverty status (NONPOOR). The switch probit regression results are presented in Appendix A1. The outcome variable equals 1 if household is non poor and 0 if otherwise.

The ATT, ATU and ATE are all positive and significant at least at 10% level implying that remittances robustly increase the probability of households becoming non poor. Based on the ATT, remittances increase the probability of recipient households being non poor by 11.34 percentage points. The ATU shows that households that do not currently receive remittances would have had their probability of not being poor increased by 24.09 percentage points if they were to receive remittances. Similarly, the ATE reveals remittances reduce the probability of a randomly selected household being poor by 25.68 percentage points. Thus, we have strongly established that remittances are good for household living conditions. For very poor households, even small improvements in their welfare is a treasure, for it could be the difference between hunger and starvation.

There are several mechanisms by which remittances can reduce the incidence of poverty. First, funds received from remittances could be used to start a business, or invested in an on-going business to yield more returns for the sustenance of the household. Second, remittances could be used to finance the education of children who in the future will obtain or create jobs and earn more income to meet the needs of the family. Third, remittances could directly finance household consumption expenditures on food, health, clothing, housing among others, thereby directly improving wellbeing. Fourth, remittances provide insurance cover to help households cope with shocks. Our findings agree with previous studies on the impact of remittances on poverty reduction in Ghana (see Castaldo, Deshingkar and McKay, 2012; Adams and Cuecuecha, 2013).

Table 6: Effects of remittances on poverty: Estimates of treatments effects

	Treatment effects		
Variable	ATT	ATU	ATE
NONPOOR	0.1134*	0.2409**	0.2568**
	(0.0698)	(0.1081)	(0.1160)

Table 6 shows results of treatment effect predictions of the effect of remittances on poverty. REMITTANCE which is the treatment is a dummy variable which is labelled 1 if household received remittances and 0 otherwise. NON POOR which is an outcome variable, equals 1 if the household is non poor and 0 otherwise. ATT is average treatment on the treated, ATU is average treatment on the untreated and ATE is average treatment effect. *, **, *** show significance at 10%, 5% and 1% respectively. Standard errors are in parenthesis.

5. CONCLUSION AND POLICY IMPLICATIONS

This study investigated the effects of remittances on financial inclusion using the GLSS 6 database, a very comprehensive and nationally presentative survey on household living conditions in Ghana covering 16,772 randomly households. The study also evaluated the effects of remittances on the welfare of Ghanaian households. We employed a novel econometric methodology, the endogenous switching probit regression which effectively handles selection on observables and unobservables as well as endogeneity, to produce robust probit estimates and treatment effects predictions. The switch probit estimates on the correlates of remittances lead to the conclusion that remittances are mostly targeted at households that are most vulnerable: headed by the aged and or a female, do not have a checking account and have no access to credit, and have had their living conditions stagnating or worsening in the period preceding the sending of remittance. This suggests that remitting behaviour of Ghanaian migrants is highly altruistic and helps fulfil very important welfare functions.

The results on financial inclusion correlates reveal that among the variables in the models, only mobile phone and level of education positively and significantly influence explain all measures of financial inclusion regardless of the remittance regime. This means that owning a mobile phone and being educated increase the probability of a household obtaining access to and being able to use financial instruments such as accounts, savings, credit and insurance, regardless of whether the household receives remittances or not. The policy lesson here is that any national strategy that aims to improve financial inclusion in whatever form must incorporate mobile technology diffusion and the promotion of formal education.

Remittance receiving households who are headed by males are found to be less likely to open an account compared to their counterparts who also receive remittances but are headed by females. Another interesting finding is that, non-receiving households who are headed by males are less likely to hold an insurance policy compared to their counterparts who also receive remittances but are headed by females. This is because female headed households are more vulnerable and hence are more likely to take measures that will help reduce their exposures. The risk averse nature of the average female also make them more likely to enter insurance contracts.

On the critical issue of the effect of remittances on financial inclusion, the treatment effect predictions show that remittances increase the probability of receiving households owning an account, saving, accessing credit and holding insurance policy by 14 percentage point, 8 percentage point, 4 percentage point and 11 percentage point respectively compared to non-receiving households with similar characteristics. Remittances confer similar financial inclusion benefits on a randomly selected household and on the counterfactual –the financial inclusion level of those households that did not receive remittances if they had received remittances. These results are not confounded by selection bias and endogeneity. The unequivocal impact of remittances on financial inclusion calls for a more balanced view by policy makers regarding both internal and external migration. The solution to the migration conundrum is not to place stumbling blocks on people from migrating but to provide incentives for people to stay and work in their communities. In the event that migration occurs, the welfare of migrants should not be left to their fate. Migrants should not be unduly chased around by city authorities or regarded as outcasts and troublemakers as we find in most situations. A comprehensive migration strategy should be developed by the state and city authorities to ensure a balance between the harnessing the benefits of migration and curtailing the negative repercussions thereof.

Finally, we found that remittances promote household welfare by reducing the probability of a household becoming poor. This adds to the growing view that remittances can reduce poverty of receiving households.

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APPENDIX A

Table A1. Correlates of Remittance and Poverty –Switch Probit Estimates

	Equation 1: Selection into Remittances	Equation 2: Poverty Status	Equation 3: Poverty Status
Variable		Remittance recipients	Non recipients
PHONE	0.1887***	0.3489***	0.2446***
	(0.0262)	(0.0668)	(0.0313)
AGE	0.0117***	-0.0029*	-0.0058***
	(0.0007)	(0.0017)	(0.0009)
LOCATION	0.1518***	-0.6095***	-0.4866***
	(0.0228)	(0.0508)	(0.0305)
HHSIZE	-0.0193***	-0.1333***	-0.1115***
	(0.0040)	(0.0151)	(0.0059)
EDUCATION	0.0016	0.0588***	0.0382***
	(0.0022)	(0.0066)	(0.0030)
EMPLOYMENT		0.0555	0.1203***
		(0.0654)	(0.0299)
SEX	-0.4661***	0.0858	0.2067***
	(0.0236)	(0.0660)	(0.0320)
LANDSIZE	-0.0011	0.0187***	0.0177***
	(0.0014)	(0.0054)	(0.0034)
ROAD	-0.0026***	0.0033**	0.0034***
	(0.0009)	(0.0017)	(0.0010)
BANK	-0.0606	0.0262	0.0784
	(0.0630)	(0.1219)	(0.0726)
MARKET	-0.0815***	0.3856***	0.2643***
	(0.0236)	(0.0472)	(0.0271)
TRANSPORT		-0.0595	0.0101
		(0.0440)	(0.0238)
POST OFFICE	0.0360	-0.4032**	-0.2631**
	(0.1038)	(0.1779)	(0.1140)
LIVING CON	-0.1055***		
	(0.0184)		
Constant	-0.6529***	1.6013***	0.3522***
	(0.0551)	(0.1631)	(0.0686)
Model diagnostics			
Observations	16,599	16,599	16,599
Rho		-0.5847***	-0.9083***
		(0.1502)	(0.0197)
LR test		57.87***	
Wald Chi2		941.89***	
Log like.		-16728.214	

This table presents results of endogenous switching probit estimates with remittances as the selection variable and poverty status as outcome variable. REMITTANCE which is the treatment is a dummy variable and is labelled 1 if household received remittances and 0 otherwise. Poverty status (NONPOOR) which is the outcome variable, equals 1 if the household is non poor and 0 otherwise. EDUCATION is number of years of schooling by household head, AGE is age of household head, SEX is gender of household head labelled 1 if male and 0 otherwise, LOCATION is location of household labelled 1 if rural and 0 if urban, HHSIZE is household size, EMPLOYMENT is employment type which is labelled 1 if household head is a salaried worker and 0 otherwise, LANDSIZE is hectares of land owned by household, BANK is distance to the nearest commercial bank in km, POST OFFICE is distance to the nearest post office in km, ROAD is motorable road and labelled 1 if community has motorable road and 0 otherwise, MARKET is daily community marked with label 1 if community has a daily market and 0 otherwise,