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Inter-linkages between remittance and savings in Ghana

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Abstract

Purpose – The increase in volumes and circulation of internal and international remittances have become a substantial part of resource flow for economic development especially in developing countries with a significant impact on household welfare. The purpose of this paper is to examine the relationship between remittances and savings mobilization.
Design/methodology/approach – Using the most recent wave of the Ghana Living Standard Survey data, the study accounts for the endogeneity in remittance receipts by employing treatment effect estimators, in addition to a probit model to establish the relationship between remittances and likelihood of savings.
Findings – The results suggest that receiving remittances significantly affects household's propensity to save. Households that receive international remittances seem to have a slightly higher probability of savings compared to households that receive only domestic remittances.
Originality/value – From the literature, whereas the theoretical relationship between savings and remittances is mixed, it is also evident that the empirical relationship between remittances and savings has not been clearly established, especially in sub-Saharan African countries in general and Ghana in particular. The present study adds to the paucity in the literature in two main ways. First, the study provides empirical evidence on the relationship between remittances and savings by not only focusing on international remittances but also on internal remittances. Second, in sharp departure from other studies, the current study employs more robust empirical estimators in estimating the relationship between remittances and savings.

Keywords Remittances, Treatment effect, Savings
Paper type Research paper

1. Introduction

Migrant remittances have become one of the important sources of development finance often outstripping other traditionally known sources such as overseas development assistance and foreign direct investment. Remittances flowing into developing countries are attracting increasing attention because of their rising volume and impact on recipient countries' economies. Remittances are migrant workers' earnings sent from destination country to the country of origin. Literature abound on migration and the inflow of remittances in the migration-development nexus and the discourse has often focused on the role remittances should play in the mix of policies to stimulate development especially for migrants' households and communities. In recent times, in view of the volumes and regularity of remittances inflow into receiving countries, policy discourses have shifted to not only looking at the effect of remittances on just the household but also more specifically its effect on the financial sector of especially developing economies.

World Bank Group (2016) estimates show that more than 247m people, or 3.4 percent of the world population, live outside their countries of birth. Also, the number of international

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migrants roses from 175m in 2000 to more than 247m in 2013 and surpassed 251m in 2015. It is also important to state that the top migrant destination country is the USA, followed by Saudi Arabia, Germany, the Russian Federation, the United Arab Emirates, the UK, France, Canada, Spain and Australia. Available data also show that the Mexico–USA corridor is the largest migration corridor in the world, accounting for 13m migrants in 2013. In terms of remittances, in 2015, global remittance flows were estimated to have exceeded $601bn of which developing countries are estimated to receive about $441bn. It is pertinent to mention that the true size of remittances, which includes unrecorded flows through formal and informal channels, is believed to be significantly larger. The top recipient countries of recorded remittances as of 2015 were India, China, the Philippines, Mexico and France.

The global outlook for remittances is varied; remittances in East Asia and the Pacific have worsened due to a weak global economy with its growth decreasing from 4.1 percent in 2015 to 2.1 percent in 2016 (World Bank Group, 2016). In the case of remittances to Europe and Central Asia, it is estimated to fall again by another 4 percent in 2016 though less substantial compared to the 2015 estimates. Latin America and the Caribbean saw remittance flows into the region increase in the first half of 2016, due mainly to a recovering US economy. Remittances to the region are expected to grow by 6.3 percent and projected to reach $72bn by the end of 2016. Meanwhile, remittances into the Middle East and North Africa were expected to increase by 1.5 percent in 2016. In the case of the South Asia region, a decline of 2.3 percent in remittances to the region is expected due mainly to the impact of declining oil prices and labor market nationalization policies on remittances from Gulf Cooperation Council countries.

The top recipients of international remittance to sub-Saharan Africa in 2015, according to World Bank Group (2016), include Nigeria, Ghana, Senegal, Kenya and South Africa. In 2016, however, remittance flows to the region was expected to decline to about 6.1 percent due to the slow economic growth in the remittance sending countries. For 2017, remittances were expected to grow at 3.3 percent and moderately at 3.8 percent in 2018 (World Bank Group, 2016). The Eurozone accounts for over 50 percent of all migrants from sub-Saharan Africa with countries such as Germany, Italy, the UK and France being the top recipients.

Internal remittances also play a critical role in financing household expenditures and tend to have significant developmental impacts. However, internal remittances tend to be smaller in size than international remittances but more prevalent among households. Gubert (2002) corroborated this assertion based on a study in Mali which reported that in a study in international migrants remit more money, than internal migrants. Also, Adams (2007) found that in Ghana while the average value of internal remittances received by households is only about 30 percent of the value of international remittances, about five times as many households receive internal rather than international remittances. Similarly, in de-Haas (2006), based on a smaller household survey in Morocco, found that the average cash value of internal remittances received was only about 30 percent that of international remittances. The point being made is that since international migrants earn more income than their internal migrant counterparts, it is much more certain that the propensity to remit (and the level of remittances) is positively linked with the income levels of migrants.

In Ghana, Adaawen and Owusu (2014) showed that migration from the northern part of the country to the southern part of the country is more pronounced, with popular destination cities being Kumasi and Accra. This is as a result of rising poverty levels due to declining agricultural productivity as well as a lag in development of the region relative to the southern sector. As a result, many households rely on remittances from the southern part of the country as a coping and livelihood diversification strategy to poverty and poor agricultural productivity in northern Ghana according to evidence by Adaawen and Owusu (2014). The same study also reported that the actual amount of remittances sent depends largely on the income level of sender. The authors also stressed the importance of mobile money services on the frequency of migrant remittances.

Earlier debates on the migration-development nexus argued that remittances are used mainly for subsistence consumption and on other non-productive spending. In recent times, however, the current debate has emphasized that remittances create investment opportunities for households. Particularly for Ghana, Black *et al.* (2003) and Adaawen and Owusu (2014) confirmed that remittances are put to productive investments such as purchasing land, establishment of small enterprises and farm investments. . This indicates some relationships between remittance and savings. The question one may ask is, to what extent does receiving remittance (both internal and international) increase ones likelihood of saving? How much remittance received gets saved in order to promote financial intermediation? This paper, in sharp departure from existing remittance literature, adds two key aspects to the debate focusing on the linkage between internal and international remittances and savings mobilization.

The next section of the paper reviews the extant literature on international and internal remittance and their impacts on welfare and savings. Section 3 discusses the data and presents some descriptive analyses, whilst Section 4 provides some theoretical perspectives on remittances and the empirical model. Section 5 discusses the results and the final section concludes the study and draws policy implications.

2. Welfare impact of internal and international remittances

At both the micro and macro levels, there is a general optimism about the developmental impacts of remittances. At the micro level, the critical importance of remittance revolves around the elimination of credit constraints of households and the increased scope for enhancement of investment opportunities and savings mobilization. Remittances have been found across several studies to have a sustainable impact on standard of living, which is reflected in improvements in household consumption patterns. A large part of private unrequited transfers are used for daily living expenses such as food, clothing and health care. The effect of this is a reduction in poverty and improvement in overall welfare (Quartey, 2006; Taylor *et al.*, 2005; Adaawen and Owusu, 2014). Households receiving remittances also invest in housing and agriculture production. de-Haas (2006) noted in Mexico that over 80 percent of international migrant households invested in housing and spent, on average, more than three times as much on construction than non-migrant households. Empirical evidence from Baldé (2011) also confirms the effectiveness of remittances in stimulating savings and investments in the sub-Saharan region.

Other studies have discussed the spill-over effect of remittances at the community level. The effect of remittances received by migrant households spilling over to the community to which receiving households belong has also been an intriguing part of research on remittances. Even though studies in this dimension are scarce, one recent study of Lao worker's remittances by Sisenglath (2009) suggested that in the long run, there exists a possibility of a decrease in the dependency of the community on external sources of income and increase in "community autonomy" leading to increase in means of transport, growth of more shops which indicates improvement in the retail sector. Sisenglath (2009) also pointed to an improvement in farming and community schools due to remittances sent by "community members." In another dimension, Orozco (2006, 2007) highlighted the importance of "Home Town Associations" in destination countries and the contribution of their remittance to the growth of their communities of origin.

At the macro level, remittances have been found to have a positive impact on a country's economic performance in the long run by not only increasing foreign exchange reserves but also financing trade deficit (Rapoport and Docquier, 2005) and also increasing the credit ratings of others (Newland, 2007). The literature is also quite stable in maintaining that remittances tend to be more stable and often countercyclical, compared to other private flows. This helps to sustain consumption and investment during economic downturns.

Quartey and Blankson (2004) confirmed the counter-cyclicality of remittance for Ghana, using pooled panel data sets. International remittances also provide foreign exchange that is vital to both the internal and the external sectors of the economy.

There is a recent but fast growing literature that also points to a significantly positive impact of remittances on financial sector development especially in developing countries (Aggarwal *et al.*, 2006; Beck *et al.*, 2007; Gupta *et al.*, 2007; Oke *et al.*, 2011). Aggarwal *et al.* (2006), who examined the relationship between remittance flow and financial development in 99 developing countries between 1975 and 2003, found that remittances have a positive impact on financial development in the recipient countries even after controlling for other factors affecting financial development and correcting for endogeneity biases. Similarly, Gupta *et al.* (2007), who also investigated the impact of remittances on financial development in 44 sub-Saharan African (SSA) countries over six time periods, confirmed that remittances promote financial development in SSA. A re compelling finding is by Baldé (2011) established that remittances have a greater stimulating effect on savings compared to foreign aid. More recent studies continue to confirm this positive relationship between remittances and financial development, according to Oke *et al.* (2011).

The basic argument is that an economy with a well-functioning financial market and low costs of transactions may help direct remittances into the financial sector through savings and investments, and thereby enhance financial development. Remittances may also compensate for a bad financial system: by loosening liquidity constraints. Entrepreneurs, for instance, rely on international and internal remittances whenever the financial system does not help as a result of high demand for collateral or high lending costs. The importance of remittances to the financial sector is further underscored by the efforts of financial intermediaries to encourage remittance recipients to put remittances in the financial system (Orozco and Fedewa, 2007). This paves the way for recipients of remittance to gain access to other financial products and services, from which they hitherto could be denied access.

In studying the pattern of remittance flow, the literature establishes that there are both micro- and macro-level factors that determine the decision and amount of remittances sent. At the micro level, socioeconomic characteristics of remitters and recipients such as age, education, consumption level and the motive of the migrant are important in explaining the amount of money sent as remittance. Buch and Kuckulenz (2004) noted that remittances are essentially "market driven" but with social considerations. Studies by Chami *et al.* (2008) and Bougha-Hagbe (2006) identify migrants' sending motives as the most important factor for studying the determinants of remittances. They did not, however, rule out the importance of other macro variables such as stock of migrants in the host countries and interest rates, cost of sending remittances, income of the migrants in the decision-making processes. This means that determinants of remittances are a complex interplay of both macro and micro variables.

The empirical literature on the determinants of remittances is, however, somewhat silent on any relationship between international and internal remittance. In the case of Ghana, a possible endogenous relationship between international remittance and internal remittance was suggested in Mazzucato *et al.* (2005, 2008), when they posited that remittances from abroad most likely have a spin-off effect which may sometimes lead to an overestimation of internal remittance and an underestimation of the multiplier effect of international remittances. Especially in situations where international remittances are "untargeted," a recipient can decide to send a portion of it to another relative or a friend elsewhere. Mazzucato *et al.* (2005) queried that when such second-tier distribution of international remittance is counted in national surveys as domestic remittance, it clearly undermines the fluidity of international remittance and overestimate the prevalence of internal remittance.

Remittances affect savings and investment and the extant literature corroborates this assertion. Kireyev (2006) asserted that remittances had a potential adverse effect, since it veers off the incentive for domestic savings and lends a strong incentive toward private consumption of especially imported goods instead of financing investment which in effect strangles domestic competitiveness and consequently increase trade deficits. A similar conclusion was reached by Bohning (1975) and Rempel and Lobdell (1978) in a much dated study on whether the effect of remittances was judged positive or negative largely resting on whether these remittances were either consumed or invested. They concluded that remittances significantly reduced investment by further financing consumption. Stark (1991) contradicted these findings by arguing that remittances are fungible which implies investment may increase even when the cash received are not invested immediately. David and Jarreau (2015) offered a different perspective when they suggest that the level of earnings is not the primary driving force of the relatively lower level of remittances. They provided a possibility that lies in the migrants using a larger part of their earnings in savings than remittances to explain the finding.

The International Monetary Fund in 2005 alleged that the size of the remittance may be influenced by the employment and income situation of the remittance source country which may affect the migrants saving behavior as well as his/her disposable income. The economic situation of a destination country plays an important role. If it deteriorates, it is likely to increase the emigration numbers and consequently the amount received in remittances increases. Kapur (2004) and Kapur and McHale (2003) found that the economic downturn in Ecuador in the late 1990s increased the rate of emigration and doubled the amount of remittances received which to a large extent influenced saving and consumption patterns. Mesnard (2004) asserted that rather than send the money in remittances, migrants set a saving target and if he/she succeeds in accumulating a target amount of asset will return to the home country and rather invest the savings in a venture that will generate a desirable flow of income that exceeds the foreign wage. Similar findings were made by Black *et al.* (2003) in their study on Ghanaian return migrants.

Similarly, Rapoport and Docquier (2005) reported that remittances positively translate into increased investment in educational attainment of children from households with migrant members. It is, however, worthy of mention that if the cost of transferring remittances is high, the migrant would rather put the money in savings than remit (DFID, 2005). From the literature above, whereas the theoretical relationship between savings and remittances is mixed sometimes depending on the cost of transfer, it is also evident that empirical relationship between remittances and savings has not been clearly established and this forms the focus of this study.

3. Data

The paper investigates the linkage between internal and international remittances and savings in Ghana using the most recent round of the Ghana Living Standard Survey (GLSS 6). The data like the other previous five rounds are a nationally representative data set covering all ten regions of the country. Actual data collected commenced in October 2012 and were completed in October 2013. The survey contains the most recent information on all aspects of the living conditions of about 18,000 households and over 16,000 individuals in 1,200 enumeration areas. Specifically, the survey collected information on the demographic characteristics of households, household expenditure and conditions, income and their components, household agriculture, access to financial services, credit and assets as well as migration and household remittances. This analysis is conducted at the household level. As such, all demographic information used in the study is based on data of the household head. The final sample size is used in the analysis is substantially reduced due to missing data.

The main dependent variable for this study is propensity to save. Whether or not the household head participates in a local savings scheme (known as susu) or has a savings account is used as a proxy for propensity to save. This variable is a binary variable constructed directly from the specific question: "does this household member have a savings account or participate in susu?" The variable is assigned a value of 1 if a household member has a savings account or participates in "susu" and 0 otherwise. The study focuses on remittances as the main independent variable of interest. Remittances are captured in two forms. The first form is as a binary variable, which takes on the value of 1 if the household receives remittances and a value of 0 if it does not. The second form of the variable of interest is captured as a categorical variable indicating four different categories, namely: household received domestic remittances only, household receives foreign remittances only, household receives both domestic and foreign remittances, with the last category being the household does not receive any remittances. The unit of analysis is at the household level. This is due to the fact that questions on remittances were asked as directly to household heads or main respondents. Specifically, remittance status of the household was directly constructed from the question "During the past 12 months has this household received or collected money or goods from […]."

Table I shows the summary statistics of the study variables used in this study. The table shows that about 55 percent of the sample has reported having savings account. With respect to remittances, approximately 30 percent of the households in the sample reported receiving remittances in the last 12 months preceding the survey. Of those who receive remittances, it appears majority (25 percent) receive domestic or internal remittances, while only 4 and 1 percent receive foreign remittance only and both domestic and foreign remittances, respectively. This suggests that the incidence of internal remittances is very substantial. It is also important to note that although the incidence of foreign remittances is small, its value far outweighs the value of total internal remittances received. The average value of remittance income (total value of both cash and food remittance) is approximately GHC230. A simple test of difference shows a statistical difference in the proclivity to save between households that receive remittances and those that do not receive remittances.

As indicated in Table I, the study also controls for some demographic characteristics of the household head. These characteristics include age, which has a mean of 42 years. With respect to gender of the household head, it appears about three-quarters (76 percent) of the household heads are men. The average household size in the sample is about four people and the mean household income is about GHC8700. More than half (58 percent) of the household heads in the sample are married while about 13 percent are single. Those without their spouses (either divorced, separated or widowed) and those who were in a consensual union are approximately 17 and 11 percent, respectively. The data indicate that only a very small (0.3 percent) of household heads in the sample have no education. About 71 percent have basic education, while those who have secondary and post-secondary education are 20 and 8 percent, respectively.

The study also controls for the industry of work of the household head. The sector of occupation has been categorized into five, namely; agriculture (38 percent), manufacturing (15 percent), mining (2.2 percent) wholesale and retail (16 percent) and services (29 percent). To control for differences peculiar to geographical locations, the study controls for the region of residence and well as the residential types, with just over half the sample (51 percent) residing in urban areas.

3.1 Theoretical framework

Until a few decades, economists viewed migration as a means by which households maximized their lifetime income by moving into high wage labor markets (Massey *et al.*, 2012). The dominant theory in the migration literature painted a picture which associated remittances with increased consumption and continued reliance on remitting household members. An alternative view offered by the new economics of labor migration hypothesizes that migration is closely associated with overcoming local market failures. Remittances (a consequence of migration),

Study variables	Mean	SD
Dependent variable		
Household has a savings account/participates in susu	0.548	0.5
Remittance variables		
Household receives remittance	0.296	0.46
Remittances income	234.489	1,470.35
Household receives domestic remittance only	0.247	0.43
Household receives foreign remittance only	0.038	0.19
Household receives both domestic and foreign remittance	0.011	0.11
Household receives no remittance	0.704	0.46
Demographics of household head		
Age of household head	41.719	12.91
Gender of household head	0.759	0.43
Household net income	8,707.125	24,958.14
Household size	3.977	2.48
Household head is married	0.585	0.49
Household head is in a consensual union	0.109	0.31
Household head is not with spouse	0.174	0.38
Household head is single	0.131	0.34
Household head has no education	0.003	0.06
Household head has basic education	0.714	0.45
Household head has secondary education	0.204	0.4
Household head has post-secondary education	0.079	0.27
Household head works in the agricultural industry	0.376	0.48
Household head works in the mining industry	0.022	0.145
Household head works in the manufacturing industry	0.15	0.36
Household head works in the wholesale/retail industry	0.159	0.15
Household head works in the services industry	0.292	0.45
Location variables		
Household head lives in an urban location	0.517	0.5
Household head lives in Western region	0.126	0.33
Household head lives in central region	0.101	0.3
Household head lives in greater Accra region	0.145	0.35
Household head lives in Volta region	0.102	0.3
Household head lives in Eastern region	0.131	0.34
Household head lives in Ashanti region	0.145	0.35
Household head lives in Brong Ahafo region	0.103	0.3
Household head lives in northern region	0.051	0.22
Household head lives in upper east region	0.05	0.22
Household head lives in upper west region	0.046	0.21
Observations	10,453	

Table I.
Summary statistics of study variables

according to Stark and Bloom (1985), are described as a means by which households are able to diversify household risks – possibly from crop failure, price fluctuations and job loss, accumulate capital and in most cases substantially reduce household credit constraints. These, according to the authors link migration and remittances with more positive development prospects. Massey *et al.* (2012) therefore argued that international migration increases households' liquidity which may allow household to survive local economic shocks and engage in productive investment. The theory also suggests that the amount remitted and the uses of the funds remitted are both influenced by the characteristics of the household as well as the local and national economic conditions. In general, household characteristics and the conditions of local and national economies dictate the likelihood of households to engage in productive investment (Amuedo-Dorantes and Pozo, 2006; Duany, 2010).

3.2 Empirical model

The study estimates two main model specifications. The first model estimates a probit given that the dependent variable (*Savings*) is binary. The model is represented by the equation below:

$$Savings = \gamma + \alpha\, Remit\tan ce + \beta\, Remit\tan ce\ Value + \delta\, Demographic + \rho\, Loc + \varepsilon, \quad (1)$$

where *Remittance*, the main explanatory variable of interest is captured in two different forms. First, as a binary variable which indicates whether or not the household received remittances in the past 12 months prior to the survey, and second, as a categorical variable (with four main categories as described above in the data section). These are run as separate analysis. *Remittance Value* captures the total value of remittances received by the household, while *Demographic* captures the socioeconomic characteristics of the household head that are likely to influence the household's propensity to save. These include age, sex, marital status, education of household head and industry of employment of household head. It also captures the size of the household as well as the household income level. *Loc* is a vector of variables that captures the location characteristics of the household including whether the household is located in the urban or rural area. It also includes the region of residence.

The co-efficient α merely measures the probability of remittance-recipient households to save but makes no causal inferences. The expected sign on this co-efficient is positive which suggests that households that receive remittances are associated with a higher propensity to save.

In order to make causal inferences using the observational data, the study estimates a treatment effect model using multiple treatment effect estimators. Fully capturing the effect of remittances on propensity to save may require an estimator that is able to account for possibility of non-randomness in the migration and remittance decisions. For example, households that might have high levels of debt may be more likely to receive remittances. As such, receiving remittances may not be purely random. Using the probit model will, therefore, yield biased estimates.

The treatment effect technique as described by Cattaneo (2010) has been used to obtain more unbiased estimates of program effects using observational data. Given that in observational data, an individual cannot be observed under the treatment and control arms simultaneously, the researcher is unable to directly compare the differences in the averages of the outcomes. The treatment effect specification, therefore, allows for the estimation of potential means which then allows for a comparison between the potential mean and the mean outcomes. To ensure robustness, the study makes use of different estimators. In this study, whether or not the household receives remittances are regarded as the "treatment." The treatment effect of receiving remittances, represented by TREAT for the household heads, is written as:

$$Treat_i = Y_i(1) - Y_i(0)$$

In this context, Y_i (1) represents the propensity to save if household head received remittances and Y_i (0) represents the propensity to save if household head did not receive any remittances. To check for stability and robustness of the coefficients, the study estimates three main estimators namely, regression adjustment (ra), inverse probability weights (ipw) and inverse probability weights with regression adjustment (ipwra). These three estimators model for the non-random treatment assignment in different ways. In regression adjustment, the non-random assignment nature of the treatment variable is dealt with by modeling the outcome. The ipw estimator models the treatment assignment process and does not specify a model for the outcome, while the ipwra estimator accounts for the non-randomness in treatment assignment by modeling both the outcome and the treatment.

All three estimators pose the question "how would the outcomes (propensity to save) have changed if the household heads who receive remittances did not receive" or "how would the outcomes have changed if the households that did not receive remittances did receive?" The difference in these two counterfactual outcomes also called potential outcomes precisely give the actual effect of receiving remittances on proclivity to save.

4. Results and discussion

Estimation results for the probit models are shown in Table II. Model 1 shows results for when the remittance variable is measured as binary variable – whether or not the household receives remittances. Model 2 represents estimates when the remittance variable is coded as a categorical variable with four categories, indicating if the household received internal remittance only, international remittance only, both internal and international remittances or did not receive remittances at all. The last category is used as the base category in model 2. From model 1, the results suggest that receiving remittances significantly increases the household's propensity to save. Specifically, households that

Table II. Probit Estimation based on different measures of remittances

Variables	Probit Model 1 Binary measure	Probit Model 2 Categorical measure
Household receives remittance	0.0592*** (5.35)	–
Remittance income	9.56E-06 (1.517)	1.00E-05 (1.29)
Household receives domestic remittance only		0.0562*** (4.997)
Receives foreign remittance only		0.0692*** (2.631)
Receives both domestic and foreign remittance		0.1127*** (2.605)
Age of household head	0.0002 (0.406)	0.0001 (0.35)
Household income	0.0000*** (3.934)	0.0000*** (3.939)
Household size	0.0210*** (9.951)	0.0210*** (9.957)
Household head lives in urban locality	0.0990*** (8.669)	0.0986*** (8.619)
Household head is male	0.0610*** (4.601)	0.0605*** (4.563)
Household head has basic education	0.0837 (1.004)	0.0829 (0.994)
Household head has secondary education	0.2034*** (2.420)	0.2023*** (2.410)
Household head has post-secondary education	0.2775*** (3.262)	0.2765*** (3.248)
Household head works in manufacturing	0.1747*** (11.211)	0.1741*** (11.161)
Household head works in mining	0.1303*** (3.902)	0.1305*** (3.912)
Household head works in services	0.2087*** (14.763)	0.2081*** (14.711)
Household head works in wholesale and retail	0.2008*** (12.443)	0.2002*** (12.392)
Household head is married	0.0348** (2.10)	0.0348** (2.096)
Household head is in a consensual union	0.0063 (0.321)	0.0064 (0.327)
Household head not with spouse	−0.0438** (−2.217)	−0.0443** (−2.244)
Household head lives in western region	0.0348* (1.889)	0.0342* (1.853)
Household head lives in central region	−0.1053*** (−5.385)	−0.1053*** (−5.386)
Household head lives in Volta region	−0.0506** (−2.542)	−0.0505** (−2.535)
Household head lives in eastern region	−0.0968*** (−5.193)	−0.0966*** (−5.182)
Household head lives in Ashanti region	0.0848*** (4.894)	0.0844*** (4.869)
Household head lives in Brong Ahafo region	0.0765*** (4.003)	0.0756*** (3.95)
Household head lives in northern region	−0.1140*** (−4.665)	−0.1136*** (−4.647)
Household head lives in upper east region	−0.0739*** (−2.942)	−0.0738*** (−2.936)
Household head lives in upper west region	−0.0102 (−0.401)	−0.0098 (−0.383)
No. of obs	10,453	10,453
Pseudo R^2	0.1136	0.1137

Notes: *t*-Statistics in parentheses. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$

receive remittances are about 6 percent more likely to save compared to households that do not receive remittances. A possible explanation for this finding is that although households may use a substantial component of their receipts on basic household consumption items, households do not usually spend all their remittance income on such items. They may also spend some part of it on savings and other productive activities as confirmed by Adaawen and Owusu (2014) in their study on Ghanaian households that receive remittances. This finding may also lend credence to the argument put forward by Edwards and Ureta (2003). They suggested that households may view remittances as transitory income and as such would choose to spend such funds on investment goods rather than spend all on consumption. This positive relationship is also consistent with findings from Adams and Cuecuecha (2010) and Adams (1998).

From model 2, however, the results indicate that the proclivity to save very much depends on the type of remittances received. Households that receive foreign remittances seem to have a slightly higher probability of savings compared to households that receive only domestic remittances. Similarly, households that receive both internal and international remittances are about 12 percent more likely to save compared to households that do not receive remittances. The differences in probabilities of the different types of remittance are shown in Figure 1. The diagram shows an increase in propensity to save as one moves from receiving only domestic remittances, through foreign remittance to receiving both remittances. However, the graph shows a significant dip in propensity to save if the household receives no remittances. The higher probability of savings associated with international remittances may be explained by the relatively high values of most foreign remittances. As suggested in Quartey and Adamba (2015), the value of international remittances to Ghanaian households is higher than internal remittances due to the depreciation of the local currency. As such, remittances received in foreign currencies provide households enough funds to save or invest. Therefore, all things being equal, the higher the value of the remittances received, the higher the likelihood of savings. Figure 1 shows the marginal probabilities to save by remittance type.

Across the two models estimated, household size, gender of household head and urban residence increase the likelihood of savings by 2, 10 and 6 percent, respectively. Although household income also plays a significant role, its magnitude is relatively small. All things equal, higher household income may substantially reduce the liquidity constrains that households may face in financing household consumption and other household risks.

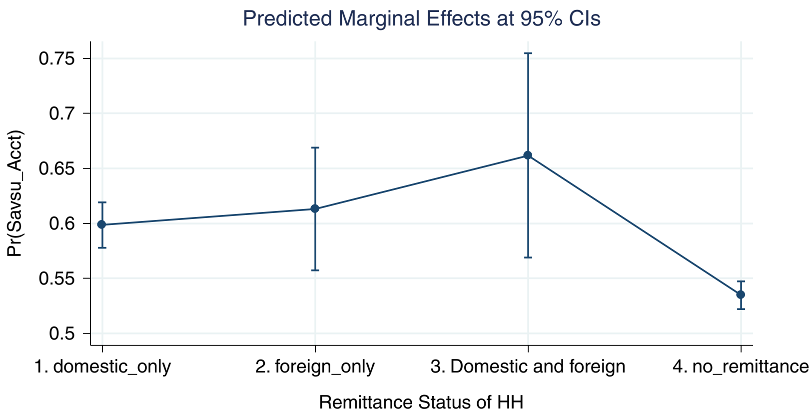

Figure 1.
Marginal effects of probabilities to save by remittance categories

As such, any "excess" money in the form of higher remittances may encourage household savings or other forms of investment. This finding is also consistent with Massey *et al.* (2012). Contrary to Massey *et al.* (2012), however, male household head appears to be associated with a higher probability of savings compared to female heads. This may be because female headed households may spend more on household needs including food, clothing and health care compared to male headed households. As such, such households may not have enough money to put into savings compared to male headed households. Also, larger households may be encouraged to save for future needs compared to relatively smaller households.

Education and industry of employment also appear to be positively associated with increased likelihood of savings. Specifically, households with heads who have secondary and post-secondary education are about 20 and 27 percent, respectively, more likely to save compared to household heads with no education. Similarly, household heads who are within mining, manufacturing, services and whole sale and retail industries are 13, 17, 20 and 21 percent significantly more likely to save compared to other households engaged in the agricultural industry. A possible explanation is that household heads that have secondary or post -secondary education are most likely to have relatively highly paid employment and as such are able to make enough and invest the excess, compared to households that have no education. In addition, given that the households engaged in agriculture usually do so on relatively small scales or subsistence level, their income earning capacities turn to be low compared to other people in the other industries. Due to their low-income generating capacities, they may be less inclined to save or invest. The estimates also suggest a significant relationship between marital status and propensity to save. Married household heads have an increased likelihood of savings compared to household heads that are single. Married household heads are about 4 percent more likely to save. The likelihood of pooled resources may exist if the household head is married. As such what may seem as "excess" resources may be put into savings or other investment ventures. However, as one may expect, household heads who are either divorced, separated or widowed may not have the opportunity of pooled resources. This may go a long way to reduce the probability of savings. The results show that household heads that fall within this category are approximately 4 percent less likely to save compared to single households. The results also indicate some regional differences in propensity to save.

In Table III, the estimates show the actual causal relationship between receiving remittances and propensity to save. These estimations account for the possible selectivity bias that may exist between receiving remittances and likelihood of savings. To ensure robustness or stability of the coefficients, three different treatment effect estimates are used. For each of the estimators, the average treatment effect is calculated as well as the potential means. Model 1 from Table III shows estimates for the regression

Table III.
Treatment effects and potential means

	Treatment effects estimators		
	RA	IPW	IPWRA
Average treatment effect (ATE)			
Households that receive versus	0.0661***	0.0662***	0.0667***
Households that do not receive	(6.51)	(6.456)	(6.569)
Potential means			
Receive remittance	0.5295*** (91.595)	0.5305*** (91.625)	0.5296*** (91.609)
Not receive remittance	0.5956*** (67.738)	0.5967*** (67.259)	0.5963*** (67.839)
Observations	10,453	10,453	10,453

Notes: *t*-Statistics in parentheses. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$

adjustment estimator, model 2 shows results from the inverse probability weights estimator and the last model, model 3, shows the estimates from the inverse probability weights with regression adjustment estimator. Across the three estimators, the results suggest that even after controlling for the possibility of selection bias, whether or not a household receives remittances significantly affects their propensity to save. These results suggest that, on average, households that receive remittances are about 7 percent more likely to save compared to households that do not receive remittances. The potential outcomes presented in the table indicate what the probabilities of savings would have been if those who receive remittances did not receive remittances and vice versa. This gives the true counterfactual and hence the true effect of the remittances on propensity to save. The estimates suggest that the probability of savings for households that did not receive remittances would have been 60 percent had they received remittances, and the probability of savings for households that receive remittances would have been 53 percent if they did not receive remittances. The difference of 7 percent, therefore, shows the true effect of remittances on households' propensity to save.

5. Conclusions and policy implications

The volumes of international remittances and the circulation of internal remittances have increased substantially in recent times. Despite the large literature that exists on the macro and micro level impacts of remittances, little attention has been given to the relationship between international remittances, internal remittances and savings. The limited literature is more focused on Latin America and shows mixed results. This, therefore, makes it necessary to examine these relationships in the context of Ghana.

In general, the results suggest that remittances play an important role in the saving culture of Ghanaian households. Specifically, remittance-recipient households are associated with higher probabilities of savings compared to non-remittance-recipient households. Also, the results suggest that households that receive international remittances have an increased likelihood of savings compared to households that receive only internal remittances, even though the proportion of households that receive internal remittances is higher than households that receive international remittances. The likelihood of savings is also higher for households that receive both international and internal remittances.

The study also finds that socioeconomic characteristics of the household heads, such as household income, education, industry of employment, marital status and location, are all important in determining households' propensity to save. The results also suggest that there are significant differences in likelihood of household savings across the various regions.

Results from the second set of estimations also confirm a significant causal relationship between remittances and savings even after controlling for the possibility of selection bias. These results are also robust as all the three matching estimators employed point to the same conclusion.

From a policy perspective, the findings from this study offer some useful policy options. Given the significant volumes of international remittances as well as the positive relationship between remittances and propensity to save, policy makers may foster financial inclusion by creating a conducive environment to facilitate receipt of remittances. Perhaps, the policy makers could focus on working to reduce the cost of sending and receiving remittances which may encourage migrants to send more remittances on which increased savings could be leveraged.

According to the World Bank's report on remittance prices, the sub-Saharan region records the highest cost of sending and receiving remittances. A reduction in this cost may encourage remittance sending household members to use the formal channels of remittance and would also encourage the receiving households to remain in the financial sector where they will be able to access other financial products and services.

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