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The role of formal and informal remittances as the determinants of formal and informal financial services

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Abstract

Research background: The choice of financial services and remittances are important as they influence the livelihood of remittance recipients, who are mostly poor and financially excluded. In literature, extensive evidence suggests a positive impact of the size of remittances on access to financial inclusion and financial development of remittance-recipient countries. However, a concern of such studies is that they might provide a biased outcome as the available data of remittances tend to be formal, whereas informal remittances are difficult to observe. Hence, their evidence might not be applicable in developing countries where remittance transfer via informal channels is very popular.

Purpose of the article: The main objective of this study is to examine the effect of the remittance channel (formal and informal) on the choice of formal, informal financial services of credit and savings of remittance recipients.

Methods: As our dependent variable is a financial service which is a categorical variable (formal and informal), the paper will employ a multinomial logistic regression model to estimate the impact. The data employed in this analysis is from the Finscope survey conducted in Myanmar in 2013 and 2018. Myanmar is the best context for our study, as it is one of a big migrant-sending countries and a developing country whose financial sector is significantly underdeveloped.

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Findings & value added: Our findings show that formal remittances promote the use of formal financial services such as credit and savings. However, there is no evidence regarding women recipients' informal channels and formal financial services. Our evidence also suggests there is a need for the government to encourage migrant workers to transform informal remittances into formal ones by removing the barriers of formal remittance channels to promote the use of formal credit and saving among remittance-recipients who are poor and financially excluded.

Introduction

Remittance flows to low- and middle-income countries (LMICs) were estimated to reach \$551 billion in 2019, up by 4.7 percent compared to 2018. International remittances are considered formal if they are sent through formal channels, which are monitored by the central bank of the countries. Formal remittances are encouraged by the authorities as they help enhancing the transparency of money flows and can reduce the risk of loss and theft during transfer. However, for migrant workers, sending remittances through formal channels remains an issue due to the high costs of such transfers coupled with the lack of financial infrastructure on both sending and receiving sides. On the other hand, remittances sent through informal financial institutions such as unregistered MTO, Hawala or Hundi, relative/friend have become popular due to low costs, wide accessibility, and the speed of transfer (Freund & Spatafora, 2005). Governments of many recipient countries have tried to promote the formal flow of remittances concerning the illegal flow of money, such as money laundering and terrorism financing. Regarding safety, sending remittances through informal channels might put money at the risk of loss and theft. It is estimated that around the world, informal remittances sent by migrant workers back in 2004 accounted for 25%-250% of formal remittances (Freund & Spatafora, 2005).

The choice of formal or informal financial services by remittance recipients is another essential area that might affect their livelihood. Financial services are considered formal if provided by formal financial institutions, such as banks, MFI, saving and loan companies, insurance companies etc., which central banks license. Usually, formal savings, credit and insurance facilities are available for large-scale businesses and high-salary workers in the urban areas, while informal financial services are usually popular among people in rural areas. There are several benefits on both sides. For example, people who receive formal financial services can deposit their savings in a safe and/or get a low-interest rate on credit.

On the other hand, informal financial institutions, such as moneylenders, unlicensed financial operators, and savings and credits associations are unregistered enterprises. Despite low transaction costs and simple proce-

dures, people who gain access to informal credit products are charged with high-interest rates and might end up being over-indebted. Due to the lack of government regulation, the informal financial system allows people to apply for loans from multiple sources, putting them at risk of defaulting. In addition, saving with informal financial institutions is perceived to be risky, as such transactions are not protected or regulated by law.

As both remittances and financial services are essential for the household livelihood, especially for poor households, it is important to deepen our understanding regarding the two variables. The problem in the literature is that it could only provide empirical evidence that explains the link between remittances and financial development or financial inclusion in the context of the country in which informal remittance transfer is not an issue, or some studies use the size of remittances as explanatory variables which are formal or official. Recall that remittances are composed of formal and informal, and the informal ones are not easy to observe. In countries in which financial sectors are considerably underdeveloped and in which informal remittance transfer is popular, such evidence might not be applicable as the outcome might be biased. Therefore, it is important to examine the effect of remittances using remittance channels as a proxy for remittances as an explanatory variable in the context of a country with informal remittances transfer that are popular among migrant households. To address this research problem, we aim to examine the link between the choice of remittance channels and the use of formal and informal financial services of remittance recipients in Myanmar by employing a quantitative analysis, using a multinomial logistic regression model as our financial service variables will be treated as binary.

If sending remittances through formal channels is proved to be promoting access to formal financial services and informal remittance is proved to increase the probability of using informal remittance, the government's efforts to promote formal remittance by reducing transaction costs will not only enhance the visibility of money flows, but would also promote formal use of financial services and discourage the informal use of financial services. The recipients, who are always ignored and vulnerable, will be formally financially included as the formal financial products are affordable and have good quality. In addition, financial institutions that offer financial products could promote their products and services by reducing the barrier to a remittance transfer.

The study will be organized as follows: Chapter II will review previous studies on the link between remittances and other variables, focusing particularly on remittances and financial services. It will also present the hypotheses of the study. The next chapter will explain the research methodol-

ogy, including data description and source, definitions of variables, and estimation strategy. The result and discussion will be discussed in chapter 4. Finally, the paper will be concluded with the summary of the study, limitations, and practical implications.

Literature review

The studies on remittances linked with other economic and social indicators have been widely carried out in developing countries, ranging from micro-economic and macro-economic aspects to poverty and the welfare of people in recipient countries. These studies include the effect of remittance on household consumption conducted by Mondal and Khanam, (2018); on economic growth by Depken *et al.* (2021); Jude *et al.* (2019); Meyer and Shera, (2016); Jouini (2015); inflation and exchange rate by Ghauri *et al.* (2019); on poverty and inequality by Anyanwu and Erhijakpor (2010); Bang *et al.* (2016); Masron and Subramaniam (2018); on recipient welfare by Munyegera and Matsumoto (2016). Among other sources of remittances, the most crucial remain remittances linked with labor and student migration (Mishchuk *et al.*, 2019; Oliinyk *et al.*, 2021). These financial flows (or their decrease in case of permanent migration of economically active population) can significantly affect the dynamics of macroeconomic processes and results, like labour market dynamics and communication processes (Andersson, 2019), level of life and inequality (Al-Srehan, 2020), fiscal revenues and social expenditures (Cristea & Grabara, 2019; Mishchuk *et al.*, 2018; Vučković & Škuflić, 2021). While some studies found remittances to be significant in promoting economic growth, household welfare, income equality, and poverty reduction in many countries, others show different ways around, depending on the context of the countries, methodology, and data employed in their studies.

Besides these studies, the nexus between remittance and financial development has gained momentum among researchers. An extensive number of studies have been carried out to examine the effect of remittances on financial development in developing countries by employing different methods, data and time. Interestingly, most studies found a significant positive effect of remittance on financial development. Gupta *et al.* (2009) found strong evidence that remittances significantly affect financial development in sub-Saharan countries. The study employed (Bhattacharya *et al.*, 2018) found similar evidence of a long-run relationship between remittance and financial development in the 57 largest remittance recipient countries, using the dynamic system-generalized method of moments and annual data

during the period of 1992–2012. Evidence from 32 Latin America and Caribbean countries also suggest bidirectional link between remittances and financial development (Fromentin, 2018). Also, Kakhkharov and Rohde (2019) found significant impact of remittance on financial development in 27 former communist countries during 1996-2013 period. In contrast to Gupta *et al.* (2009), who found positive significant impact, Coulibaly (2015) show no evidence that remittances promote financial development in Sub-Saharan countries. In short, most of studies show the important role of remittance in promoting financial development. However, they are missing an important point in the literature that financial development and financial inclusion are not the same. As stated by Anzoategui *et al.* (2014), the development of financial sector due to remittance inflows doesn't necessarily mean recipients are more financially included since higher remittances flows might be channeled to non-remittance recipient household, and therefore, keeping them out of the financial system.

Acknowledging such a flaw in literature, the studies on the link between remittance and financial inclusion have attracted the interest of researchers and scholars. To our knowledge, several studies have been carried out to investigate the effect of remittance on financial inclusion. Among them, Anzoategui *et al.* (2014) is the first study that examined whether remittance promote financial inclusion in El Salvador. Using household-level survey, the study shows positive impact of remittance on demand for saving accounts, but not for credit accounts. However, the study suggests that if credit constraints can be removed, demand for credit instrument would be reverse. Also, Nyanhete (2017) examined the link between mobile remittances and women's financial inclusion and suggest that international mobile remittances are important tools to reach people. It also highlights challenges that it can't reach people in rural area. Furthermore, Ambrosius and Cuecuecha (2016) and Ajefu and Ogebe (2019) used household-level data to find out the effect of remittances on the use of formal and informal financial services of recipients in Mexico and Nigeria, respectively. In Mexico, the study shows that remittances have significant impact on ownership of savings accounts, the existence of debts, and on recent borrowing. Also, remittances facilitate in savings with formal financial institution, while loans are facilitated in informal financial sector. In Nigeria, the study suggests the authority to reduce the cost and barriers of remittance to promote the use of formal financial services (Ajefu & Ogebe 2019). Our study also attempts to address such a conspicuous oversight in the literature.

While the study on the relationship between remittances and financial services as well as financial inclusion is abundant, the link between remittance channels and the choice of financial services is not known. This study

extends the existing knowledge in a few ways. First, it provides empirical evidence using quantitative analysis of the international remittance channels and their impact on formal and informal access to financial services of recipients. Previous studies focused mainly on the size of remittances in relation to financial inclusion and development, so instead of using the amount of remittance, we use remittance channel as the key independent variable. Second, we will analyze the relationship with consideration to access to financial services by women recipients as they are potential beneficiaries of remittance inflows. The paper hypothesizes that formal remittances will promote formal use of financial service by women. Finally, in addition to the studies that used a specific formal remittance channel (e.g., MTO), our study will include all types of formal remittances channel such as bank, MTO, etc., in our analysis.

The study suggests several reasons why remittances channels might have direct impact on financial services (formal or informal). First, the recipients who have received remittances through formal channels should have knowledge and experience about financial products of formal financial institutions where they are able to seek for a safe place to deposit their money as their incomes are increasing or it might enable them to look for a loan. Second, migrants who send remittances through formal channels might influence their family members in the choice of formal financial services. Finally, remittance recipients might have been interacting with financial workers who provide them with financial products. Under the advertising influence of a financial service providers, they might become motivated to further use other financial services. However, those who have received remittances through informal channels might continue to allocate their money through conventional (informal) ways. Based on these reasons, our hypothesis can be stated as follows:

Hypothesis 1: *Formal remittance has a positive relationship with the access to formal financial services.*

Hypothesis 2: *Informal remittance has a positive relationship with the access to informal financial services.*

Hypothesis 3: *Formal remittance has a positive relationship with the formal use of financial services by women.*

Hypothesis 4: *Informal remittance has a positive relationship with the informal use of financial services by women.*

Research methods

Data source and description

To achieve our main objective, we use data from FinScope survey on household in Myanmar carried out in 2013 and 2018. Myanmar is one of the developing countries whose GDP per capita is less than USD 1,500 and one of the main beneficiaries of remittances. Also, it has considerably underdeveloped financial sectors in which informal financial services remain popular. Geographically, more than 70% of its emigrants are working in a neighboring country, Thailand. Such a close distance between the two countries ensures that sending remittances via informal channels remains popular until recent days. Shorter distance means lower risk of loss during transfer. According to Table 2, Myanmar migrant households who received remittances via non-formal channels constituted almost half (43.9%) of those. Hence, in this study, Myanmar is the most suitable context to test our hypotheses.

According to the survey, the sample data was the results from a survey of 10,600 face-to-face interviews adult Burmese respondents whose age is 18 and above. In our study, we only select household respondents that receive remittances from abroad (domestic remittances are excluded from our study), which is 650 respondents, accounting for approximately 7% of the total number of respondents. The survey also provides information on remittance channels, financial services and household demographics such as housing condition, utility, financial access, education, income, number of adults and dependents and ages of household. The Main selected variables for our estimation include education, income, age of head of household, remittances, and financial access by recipients. Although the survey provides rich amount of information, only two periods 2013 and 2018 are available.

With respect to types of financial services and remittance channels, Myanmar recipients received money from their family members abroad mainly Thailand, Malaysia, China, Singapore, Japan, and Korea through three different channels — formal, informal, and family and friends. Remittance recipients are those who received remittance during the past 12 months. As for financial services, there are four options for a recipient including formal, informal, others (e.g., home/secret place for saving), and no access to financial service. It is important to note that the order of these options is critical for picking purpose, meaning if a recipient have more than one option, our coding will pick the highest order. However, we do not treat the variable as ordinal variable for estimating purpose.

Definition of financial channels

The definition of each financial products is carefully defined in Table 1 (See Appendix) as they might affect the overall outcomes. In this study, each channel must have at least two characteristics to be called formal, informal, and others. A formal channel is called “formal”, if, first, it is offered by formal financial institutions that are licensed by the central bank of the country. Second, financial service customers must be charged with fee whenever there is a need of transaction. In case of saving, customers expect to receive interest, and pay interest when they borrow from the institution. Taking a bank as an example, commercial banks are licensed by the central bank and always charge its customers when using financial services.

As for “informal” channel, the financial products are offered by informal institution/entity which are not licensed by the central bank. However, like formal channel, informal financial institutions pay interest to customers in case of saving and charge fee from their customers in case of receiving money from a migrant worker. An unlicensed financial operator was taken as an example.

The last channel is called “others” if it is not recognized by any government institutions, and the transaction is made free of charge. For example, saving money at home is free from being charged and is kept in a private place. The reason that “others” is separated from Informal channel is saving with “others” tend to be unproductive as opposed to informal one. It is important to note that transaction made with formal and informal channel have similar characteristic in the sense that customers involve with fee and interest, but not for “others”. Also, any transaction with “informal” and “others” are not officially recorded, as opposed to “formal”. Below are further details of each financial product with their channels.

Estimation strategy

Since we attempt to investigate the impact of the choice on remittance channels on the use of formal and informal financial services, we will employ multinomial logistic regression model as the dependent variable is categorical, while at the same time, we will employ the concept of interaction terms in response to the type of our data set which is a pooled cross-section and categorical type of independent variables.

The multinomial logistic regression model we are going to use is the generalization of binary logistic regression model, which can be specified as follow:

$$P(FIS = j|X) = G(\beta_j X_i) \tag{1}$$

where $j = 1,2,3,4$. $G(\beta_j X_i)$ is a cumulative density function (cdf) of logistic distribution; in other words, it is a non-linear function transformation of model (2), (3) and (4) whose predicted probabilities are limited between zero and one. $X\beta_j$ represent the matrix form of linear combination of independent variables.

$$P(FIS = j|X) = G(\beta_j X_i) = \frac{\exp(\beta_j X_i)}{1 + \sum_{j=1}^4 \exp(\beta_j X_i)} \tag{2}$$

where β_j is $K \times 1, j = 1, \dots, J$. FIS includes SAV and CRE representing financial services such as saving and credit respectively, taking value 1 if recipient choose formal financial services and 2 for informal service, 3 for others, and 4 for no financial services. Symbol $\phi(\cdot)$ is a logistic function. As the response probabilities must sum to unity, our logistic function with alternative can be specified as:

$$P(FIS = 0|X) = \frac{1}{1 + \sum_{j=1}^4 \exp(\beta_j X_i)}$$

Our models with interaction terms are specified as follow:

Formal-to-Formal Estimation Model:

$$FIS_i = \beta_1 + \beta_2 ForREM_i + \beta_3 Year_i + \beta_4 ForREM_i * Year_i + \beta_5 Z_i + u_i \tag{3}$$

Reference categories: no financial service, informal remittance & others, Year 2013.

Informal-to-Informal Estimation Model:

$$FIS_i = \beta_1 + \beta_2 InfREM_i + \beta_3 Year_i + \beta_4 InfREM_i * Year_i + \beta_5 Z_i + u_i \tag{4}$$

Reference categories: no financial service, formal remittance & others, Year 2013.

In Model 3, we attempt to estimate the effect of formal remittance on formal financial services, while at the same time, we include the interaction term. In this model, *ForREM* is a binary variable, taking value 1 if a household received remittances via formal channel, and 0, otherwise. Furthermore, our variable *Z* includes Income, EDU, SEX, and AGE, representing income, education, gender, and age of respondents, respectively. EDU is education of head of household, taking value 1 if his/her education level is secondary/High school/ vocational training, 2 if he/her has university education, and 3 if he/her has no formal education or has pre-or primary education. We decide to combine no education and pre-/primary education as some older persons who went to school have forgotten how to read and write, and some with little or no education have acquired literacy through other means (John, 2013). In this respect, we put them into a category. We also convert income into log form before estimating. Finally, *u* is error term.

It is important to note why we have developed Model 4 and Model 3 in such a way that each category of remittance and financial services become the alternative of another. To answer this question, we suggest two reasons. First, before we estimate our Model 3, we convert our polytomous variable into dummy variable into 0/1 coding by setting value 1 for “formal remittance” and 0 for “non-formal remittance”, which combines “informal” and “others”, instead of converting our variable REM into 3 dichotomous variables namely “formal”, “informal” and “others”. In this way, we can estimate to effect of formal remittance on formal financial service, while keeping other channel as reference. Like Model 3, we treat *InfREM* as dummy variable, taking the value of 1 if a recipient received informal remittance during the last 12 months, 0 if they received through other means, so that it estimates the effect of informal remittance on informal financial services. Secondly, each recipient has many options of formal, informal remittances, as well as options regarding formal, informal financial service. The order of options is critical when estimating. In Model 3, if a recipient received both formal remittance and informal remittances during the last 12 months, the formal channel will be selected. By this way, we treat formal remittance as the highest priority. As for Model 4, informal remittance is treated the highest priority. These techniques are also applied in Model 5 and 6.

Formal-to-Formal Estimation for Women Recipients:

$$\begin{aligned}
 ForFIS_i = & \beta_1 + \beta_2 Female_i + \beta_3 Year2018_i + \beta_4 ForREM_i + \\
 & + \beta_5 ForREM_i * Year2018_i + \beta_6 Female_i * Year2018_i + \\
 + \beta_7 Female_i * ForREM_i + & \beta_8 Female_i * ForREM_i * Year2018_i + \\
 & + \beta_9 Q_i + u_i
 \end{aligned} \tag{5}$$

Reference categories: no financial service, male, year2013, informal remittance & others.

Informal-to-Informal Estimation for Women Recipient:

$$\begin{aligned}
 InfFIS_i = & \beta_1 + \beta_2 Female_i + \beta_3 Year2018_i + \beta_4 InREM_i + \\
 & + \beta_5 InREM_i * Year2018_i + \beta_6 Female_i * Year2018_i + \\
 + \beta_7 Female_i * InREM_i + & \beta_8 Female_i * InREM_i * Year2018_i + \\
 & + \beta_9 Q_i + u_i
 \end{aligned} \tag{6}$$

Reference categories: no financial service, male, year2013, formal remittance & others.

Our Model 5 and 6 are the extension of Model 3 and 4, where female is incorporated into. In fact, we have included variable SEX into the Model 2 and 3. However, they are different from 4 in the sense that Model 2 and 3 doesn't incorporate the interaction terms as the focus of the models is remittance channel rather than gender. Model 4 and 5, however, will capture the effect of interaction terms between three dummy variables (gender, formal remittance, and Year) and (gender, informal remittance, and Year) respectively on dependent variables.

All the models will be estimated by maximizing the log-likelihood functions. Also, the interpretation will be presented based on marginal effect and odds ratio (logarithmic form), respectively. Finally, other parameters will be given such as pseudo-R squared, and goodness of fit. Pseudo R-squared will be calculated as $R - squared = 1 - (L_{ur}/L_r)$, which compare the unrestricted log-likelihood (L_{ur}) for the model we are estimating and the restricted log-likelihood (L_r) with only a constant.

There is a concern in adopting such multinomial logistic regression models. It is the fact that might arise due to endogeneity problem, which occurred in the studies of Anzoategui *et al.* (2014), Ambrosius and Cuecuecha (2016), and (Ajefu & Ogebe, 2019). The studies applied instrumental variables to tackle the problem of endogeneity as remittances are correlated with unobserved variables and have showed reverse causation.

Our study, on the other hand, will use remittance channel as our key variable and might not be correlated with unobserved variables. As the decision to send to remittance is based on migrant workers, whereas the decision to choose type of financial services is made by households, and therefore, perhaps, there is no reverse causation issue. In attempting to investigate the determinant of remittance channel using data survey from 1,680 migrant workers in Netherland, Kosse and Vermeulen (2014) showed that migrants' education has an influence on the choice of remittance channel. As our variable household demographic has no influence on the choice of payment channel, we assume our model is free from endogeneity problem caused by omitted variable issue. Using remittance channel instead of remittances might also free the models from the problem of reverse causation.

Results

Table 2 in Appendix presents the number of respondents who received cross-border remittance with access to financial services, and with respect to its type. The table indicates that each channel covers the 650 respondent who received remittance from abroad during 2013 and 2018 and divided into difference type of financial product. For remittance, among 650 respondents, 365 respondents (56.2%) received remittance via formal channel, followed by informal channel 28.5%. Formal credit accounts for 21.1%, followed by 16% and 7.7%. The percentage of households with no access to financial services remains high at 55.2%. As for saving, the figures show that informal means are popular among household who received cross-border remittance. Also, the number of households who decided not to have savings is high at 46.5%.

According to Table 3, the odds of a recipient receiving remittance via formal channel choosing formal credit rather than not borrowing are 2.763 times higher than the odds for recipients who received remittance via "others". Also, its interaction term indicates significant relationship between remittance during 2018 with formal credit. Like credit, saving coefficient shows a positive relationship between remittance channel and formal saving. Households which received remittance via formal channel are more likely to deposit their money in a formal saving institution, compared with households which did not receive money through formal channel. The odds of a recipient receiving remittance via formal channel choosing formal saving rather than not saving are 2.922 time higher than the odds for a recipient who received remittance via "others".

Discussion

As expected, results of our multinomial regression models show that there is a positive relationship between formal remittance and formal financial services. This means that our first hypothesis holds true for estimation with respect to financial products credit and saving. The estimation, however, fails to provide evidence to support the remaining three hypotheses, which are about relationship between informal remittance channel and informal financial service and the relationship between formal remittances and formal financial services of women recipients. That is why the output of the analysis on the last three hypotheses is not given in this paper.

It appears that remittance channels are more significant than just the size of remittances in understanding whether remittance could actually promote the use of formal financial services. In general, our evidence shows that households that receive remittances via formal channels are more likely to borrow and save from formal financial institutions such as bank, MFI, and other formal financial institutions, compared to informal ones. However, specifically, our estimations show the opposite in 2008 — that is remittance-recipients are less likely to use formal financial services, compared to the informal ones.

Obviously, our evidence is consistent with the study by Ajefu and Ogebe (2019), who found that a receipt of remittances increases the probability of using formal financial services, such as deposit accounts and Internet/mobile banking, and the study by Bhattacharya *et al.* (2018), who found that remittance inflows enhance financial development. Hence, our evidence suggests that it's not surprising that studies which investigate the effect of remittances on financial development or financial inclusion show a positive relationship as the available data of remittances are mostly recorded or “formal”, and it's always difficult to observe the size of informal remittances.

However, there are at least three advantages for using remittance channels instead of the size of remittance in this study which also makes our study different from others. First, the studies that examine the link between the size of remittances and the use of formal financial services might not provide enough explanation over the effect of remittances, as we do not know which type of remittances has more influence on the choice of formal financial services. Our study, on the other hand, separate remittances into two types — formal and informal. By differentiating this variable, we understand better which type of remittances has more effect on formal access to financial services. Based on our empirical evidence, we found that households that receive remittances via formal channels are more likely to

choose formal financial service for both saving and credit. Other studies could only provide the effect of remittances in general on access to financial services and financial development of the countries. Second, there is always a concern for researchers to examine the effect of remittances on the development of financial sectors or financial inclusion with respect to endogeneity issue caused by omitted and causation problem. Ambrosius and Cuecuecha (2016); Bhattacharya *et al.* (2018) and Ajefu and Ogebe (2019) addressed the issue well but overlooked the variable remittance channels. By ignoring this variable, it is likely they are affected by the problem of biased selection, as the proxy of independent variable remittances used in their models tend to be formal only. The current study could avoid such problem by considering both formal and informal remittances.

For other variables, our study also found no evidence for the case of informal remittances in promoting informal use of saving and credits. We also found a positive relationship between the level of income and the choice of formal saving, but no evidence for the case of credit. We also found that households which are more educated are more likely to use formal saving. This is not surprising, as people with higher education tend to be more financially literate. Finally, we found no strong evidence that show relationship between age and gender with formal financial services.

Conclusions

Remittance recipients in developing countries are normally poor and financially excluded. While they can access any financial services, it does not guarantee they will access formal ones. Because the choice of financial services affects the livelihood of remittance recipients, extensive studies attempt to examine how remittances are related to access to financial services and the financial development of the countries. However, the problem with the studies is that they could only provide evidence of the effect of the size of remittances on financial development or the choice of financial services. Such studies could not provide a clear understanding of the effect of the choice of remittance channels as there are two types of remittances - formal and informal. Hence, the study's main objective is to investigate the link between the remittance channel and the use of financial services by employing multinomial regression analysis to achieve the objective. There is a small concern, however, regarding using this estimation technique as indicated in other studies with a similar topic — that is the problem of endogeneity caused by omitted variable and reverse causation. This study

assumes that the models are free of the problem, as we use the remittance channel as an independent variable, instead of the size of the remittance.

Based on our estimations, we found strong evidence that supporting a positive relationship between formal remittance channels and formal use of financial service of credit and saving. However, the study fails to provide evidence regarding informal-to-informal estimation. There has been agreement among scholars on the conclusive evidence that remittances promote financial development and formal use of financial services. However, formal remittances are more likely to promote the formal use of financial services than informal remittances.

According to our results, it is important for the government, specifically financial regulators, to reduce the barriers of formal remittances such as banks, MFI, mobile banking, online-transfer in order to promote financial inclusion for remittance recipients. With formal financial products, poor and vulnerable remittance recipients can access affordable and good quality financial products. In addition, financial institutions such as banks, MFI, who are seeking to increase their sales of such products, should make remittance transfers free if possible, since it will become a tool for promoting their financial products.

Our investigation is indeed a subject to some limitations and induces a need for further broadening the study at the largest scale and longer time horizon. The current study employs data collected from a survey conducted in Myanmar, whose financial sectors are underdeveloped, but unfortunately, it is available for only two periods. The link between remittance channels and access to financial services should be carried out in other developing countries that have various levels of financial development with a long-term time horizon.

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Annex

Table 1. Financial Products and Channels

Financial Products	Formal	Informal	Others
Saving	Bank, MFI, cooperatives, licensed financial operator, mobile money	Informal group, saving group, Jewelry/gold, livestock	Home, secret places
Credit	Bank, MFI, licensed financial operator, mobile money, cooperatives	Unlicensed financial operator, money lender	Family/Friend
Remittance	Bank, MFI, Western union, money gram, mobile money, post office, ATM	Hawala/hundi	Family/Friend, carrying cash when travelling back home

Table 2. Pooled number of households with each financial product for 2013 and 2018

Financial services	Remittance		Credit		Saving	
	Freq.	%	Freq.	%	Freq.	%
Formal	365	56.2	137	21.1	86	13.2
Informal	185	28.5	104	16	222	34.2
Family and Friend	100	15.4	50	7.7	40	6.2
No Financial services	-	-	359	55.2	302	46.5
Total	650	100	650	100	650	100

Table 3. Formal-to-Formal Estimation

	Formal Financial Service					
	Credit			Saving		
	Coefficient (S.E.)	Exp(B)	P-Value	Coefficient (S.E.)	Exp(B)	P-Value
Intercept	-0.400 (1.997)	-	0.971	-7.940 (2.486)	-	0.000
Age	-0.003 (0.008)	0.997	0.431	0.001 (0.011)	1.001	0.850
Income	-0.550 (0.326)	0.577	0.029	1.412 (0.430)	4.106	0.000
SEX	0.556 (0.277)	1.744	0.071	0.174 (0.354)	1.191	0.969
EDU1	1.460 (0.769)	4.308	0.096	-2.523 (0.636)	0.080	0.000
EDU2	1.300 (0.775)	3.669	0.283	-1.744 (0.636)	0.175	0.000
Formal Remittance	1.016 (0.324)	2.763	0.002	1.072 (0.668)	2.922	0.031

Table 3. Continued

	Formal Financial Service					
	Credit			Saving		
	Coefficient (S.E.)	Exp(B)	P-Value	Coefficient (S.E.)	Exp(B)	P-Value
Formal Remittance *Year 2018	-1.233 (0.472)	0.291	0.020	-0.270 (0.668)	0.763	0.477
Year2018	1.062 (0.373)	2.893	0.016	1.100 (0.559)	3.003	0.245
Num. of observations		650			650	
Goodness of fit (Deviance)		1313.504			119.11	
Pseudo R-squared (Nagelkerke)		0.114			0.198	
-2 LL		1341.465			1225.685	
F-Value		0.000			0.000	

Source: author's calculation; base categories: year 2013, female, no education, informal remittance and FF, no financial services.