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**SCHOOL OF BUSINESS, ECONOMICS AND LAW**

# **Facilitating Migration and Remittances**

**Investigating Financial Inclusion as an Enabler to International Migration and Remittances in Bangladesh**

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## **Abstract:**

This paper analyzes the impact of financial inclusion on international migration and sending remittances within Bangladesh. The data is taken from a household survey, conducted by the Refugee and Migratory Movements Research Unit. The survey covers 17 districts and includes 26.339 observations, 13.383 observations being international migrant households. We find that the ownership of bank and savings accounts are associated with belonging to a household with a international migrant. However, informal savings is found to influence belonging to an international migrant household. As well, formal remittance channels are found to increase the amount of remittances received by an international migrant household, though electronic remittance channels appear to affect remittances insignificantly.

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## 1. Introduction

International migration and migrant remittances are crucial components of economic growth in low and middle income countries. Worldwide international migration grew from 173

million migrants to 258 million migrants from 2000 to 2017, and remittances received by low and middle income countries increased from \$18 billion to \$466 billion between 1980 and 2017 (UN 2017). Worldwide remittances in 2017 surpassed total FDI, minus contributions from China, and total official development assistance (Chowdhury 2011; Migration and Remittances 2018).

International migration aids countries with high labor surplus by connecting the unemployed with jobs, as well as higher income (Siddiqui and Mahmood 2015, Asian Development Bank and International Labour Organisation 2016). Remittances are a key component of local development, as they lead to higher consumption and investment, education and health spending (Siddiqui and Mahmood 2015).

However, international migration and international remittance transfers are costly, and opportunities to overcome these barriers are unequal. When observing international migration, the average cost to migrate was \$2,500 in Bangladesh in 2015, and for those with low income, this means they must finance their migration via loans from their family, friends, money lenders, or banks and government organizations (Siddiqui and Mahmood 2015). Every financing option is diverse. In terms of interest cost, distance to local banks, borrower income requirements, or family and friend connections, financial access is unequal within a given population. This limits loan acquisition to a proportion of the society with the correct economic or social status; furthermore, this restricts migration and consequently, the development benefits of international migration. Moving to remittances, international migrants are squeezed by transfer costs and theft risk when sending remittances home. This is because remittance channels vary between government regulated banks, which usually provide the safest, cheapest service, and unregulated channels, such as money lenders or friends. Individuals sending and receiving remittances incur higher costs when they, knowingly or unknowingly, lack access to cheaper remittance channels.

Observing the barriers for international migration and remittances, this paper argues that by increasing affordable financial access, in particular savings, loans and remittances transfer services, worldwide access to international migration and sending remittances would increase.

This is claimed because first, increased savings leads to increased investment in opportunities such as international migration. Secondly, increased access to affordable loans would allow individuals to cover their migration costs. Thirdly, cheap remittance channels increase remittances sent home.

The term this paper utilizes to address increased financial access is financial inclusion, and differentiates financial inclusion between formal and informal finance. Financial inclusion refers to the access to savings, borrowing, and remittance services. Formal financial inclusion is access to government secured banks and institutions, and informal financial inclusion is financial services provided by family, friends or unsecured institutions such as money lenders. Although informal finance is necessary in communities with poor infrastructure, this paper will focus on formal financial inclusion because it facilitates long term growth, it is easier to measure than informal finance, and is less risky (Ayyagari 2010; Siddiqui and Mahmood 2015; Freund and Spatafora 2008; Yang 2011). Validating the connection between financial inclusion and international labor migration and remittances is important because international migration provides sustainable labour opportunities, and formal finance is a crucial component for covering the costs incurred to migrate (Bylander 2014). When financial inclusion enables international migration, households benefit by incurring higher wages, job consistency, and growth in savings and investment. Remittances sent home ensure consumption smoothing and increased health, education and insurance spending (Mahapatro et al. 2017; Yang 2011). Therefore, this paper argues that financial inclusion facilitates economic development at the household level, as it offers individuals financing opportunities to go abroad, send remittances and better their livelihoods. In this paper we will examine two comprehensive questions:

1. Does formal financial inclusion affect international migration?
2. Does formal financial inclusion influence the volume of remittances?

This paper addresses these questions by utilizing a new, 2017 data collection administered by Siddiqui and Mahmood from the Refugee and Migratory Movements Research Unit (2015). The 10 year, extensive household survey covers 17 districts in Bangladesh, and it

aims to monitor long run effects of migration on local development. It is the second survey set following the first 2015 data collection. One strength of this survey is that it provides updated information on migration and financial development characteristics in Bangladesh. Another strength of the data are the accurate recording of remittance numbers. Past research on financial inclusion within Bangladesh used the Bangladesh Household Income and Expenditure Survey (HIES) survey data, which is inappropriate as it lacks data on remittance services and migration financing methods (Siddiqui and Mahmood 2015; Sharma and Zaman 2009). For this study, measuring the full effect of financial inclusion on migration and remittances would be e HIES survey is not effective in capturing the full effect of financial inclusion on international migration a remittances ( By providing a more accurate representation of remittance volumes, this research will provide a more conclusive remittance analysis in Bangladesh. This is especially significant, as remittance research is still inconclusive on whether formal finance increases remittance volumes (Yang 2011, Jamarillo 2008, and Gibson et al. 2012).

The key findings of this paper are that formal financial inclusion, such as bank and savings account ownership, both increases the likelihood of belonging to a household with an international migrant and is connected to higher remittances received by households in Bangladesh. Belonging to a household with an international migrant is clearly beneficial, as these households were generally richer than both households with an internal migrant and without a migrant in the dataset. However, this paper finds that informal finance may still play a role in international migrant households, as the placeholder used to catch all other types of informal finance remained significant. Also, this paper finds that new electronic channels of sending remittances remain insignificant.

We will delimit our analysis to migrant households; therefore international versus internal migrants, and look past the effect of financial inclusion on non migrant households. This is to look solely at the migrating populations and discover whether financial inclusion characteristics can increase the ability to migrate. This is especially important because international migrant

households have a much higher standard of living than internal migrant households (Siddiqui and Mahmood 2015).

We readily acknowledge limitations to our analysis. Considering the data, there is limited information on the number of returnee migrants to Bangladesh, therefore, we do not get the entire long term effects of migration. As well, the data provides information on informal remittance methods, yet it likely to misread the totality of informal remittances. While the controls included take into account the other factors affecting migration and remittances, there lies other controls likely missed.

We will organize the paper as follows. Section two will address the past literature. Section three will address the hypothesis. Section four and five will address the data and methods used in the analysis. Section six will present the results. Section seven will be devoted to a discussion of the results. The output of the regressions is to be found in the Appendix.

## 2. Literature review

The literature review will first define and discuss financial inclusion, distinguish formal finance from informal finance and reason for this paper's focus on formal finance. Next, the literature review will shift to a focus on the drivers and enablers of migration. Finally, this paper will discuss the nature of remittances, remittance channels, and how formal banking services can influence savings and investment allocation in the recipient country.

### 2.1 Financial inclusion

This literature review will first recognize past findings on the effect of financial inclusion on general economic development, and then approach the difference between formal financial inclusion and informal financial inclusion. Additionally, the end of the section will discuss the effect of microfinance, a subtype of formal financial inclusion, on economic development.

According to the World Bank, financial inclusion is said to be a key enabler in the aim of reducing poverty (Claessens 2006). In 2015, the World Bank Group and IMF launched their goal to achieve universal financial access by 2020 (UFA2020). This policy launched in response to data which reported that two billion people were excluded from finance in 2015. This financial exclusion translates to an inability to finance both home and business ventures, purchase insurance, fund education and save for retirement. Poor regions often lack private bank branches due to their unpromising development prospects and the financial illiteracy of its inhabitants; therefore, public-led bank development projects are necessary to bring financial services to poor areas (Ahmed et al. 2016). Increasing bank presence may increase financial access to the poor despite lack of assets, aspirations to save and thus smooth future consumption, and lead to increased entrepreneurial activity for the non-poor and increase employment for the poor (Ahmed et al 2016).

Furthermore, a critical distinction separates formal and informal finance. Formal finance refers to financial intermediation between savers and borrowers which rely on the state to enforce contractual legal obligations (Ayyagari et al. 2010). Formal finance transactions involves the majority of the market's transactions; however, many poor individuals are neglected and seek informal finance methods. Informal finance bypasses state and legal contractual enforcement, likely escapes national accounts, and relies on inter-party relationships to enforce agreements (Ayyagari et al. 2010, Freund and Spatafora 2008). Ayyagari et al. (2010) claim that informal finance refers to "small, unsecured, short term loans" found in rural areas as agricultural, household, individual and enterprise contracts. The effects of formal financial inclusion versus informal finance are quite varied. Ayyagari et al. (2010) find that formal finance encourages higher growth and reinvestment rates despite firm size in China. Ahmed et al. (2016) discover that more formal bank branches within rural Bangladesh leads to increased household per-capita expenditure and decreased proportion of people living below the poverty line. Informal finance, however, may be necessary when formal financial systems are undeveloped and costly. Beck et al. (2011) show that the African formal financial sector is plagued by uncompetitiveness, driving finance costs up, and thus stalling development by the role a formal financial sector can only fill.

Formal financial sectors provide security, ease, and efficiency to the market of borrowers and savers that the informal sector cannot. On remittances, Freund and Spattafora (2010) suggest that formal inclusion increases the value of remittances sent in a country. Given the evidence that formal financial inclusion is a key enabler to economic growth, we will focus on formal finance when assessing the effect of finance on international migration and remittances..

The research on microfinance will be discussed since it has been believed to be a solution to lacking formal financial access.. While initially popular, microfinance has received criticism for veering far from its original poverty reduction goal (Ghosh 2013). Ghosh (2013) claims that microfinance has followed reckless loan strategies, similar to the loaning behavior in the financial crisis, injecting risk and volatility into the market. Such irresponsible strategies include extending debt to fragile clients, providing wrong incentives, poor corporate governance and inadequate risk management. The effectiveness of microfinance is questionable, with some asserting microfinance as turning into the nemesis of reducing poverty (Bateman and Chang 2012). The inconclusive discourse also has some supporters who claim that microfinance could help fund migrant workers abroad (Sharma and Zaman 2009).

## 2.2 Drivers of migration

Now that financial inclusion and its development effects are discussed, this paper will discuss the general drivers of migration, the financial status of migrants and how formalized financial inclusion enables migration and remittances.

Drivers of migration are characteristics that influence the decision to migrate. One major driver of migration is the lack of local work opportunities. The Bangladeshi job market experiences a large labor surplus, where an estimated 1.8 million new jobs must be created to employ the upcoming entrants in the market (Asian Development Bank and International Labour Organisation, 2016). Consequently, the need for jobs causes Bangladeshis to seek employment in other nations. Higuchi and Tanno (2003) find a similar story in a work deficient Brazil, where Brazilians have steadily migrated to Japan since the 1980s. Massey and Espinosa (1997) also find that Mexican households send migrants to the US due to a large displacement of work



opportunities by competitive markets. Other drivers of migration include achieving a better standard of living and the loss of local agricultural productiveness from natural disasters (Siddiqui and Mahmood 2015).

The last driver of migration discussed here is higher income generation. Stark and Taylor (1991) find that Mexicans immigrating to the United States seek higher income, and even with less altruistic motives such as having a higher income than neighbors. Lilleør and Van den Broeck (2011) claim that income level differences between home and destination countries drives migration. This is relevant in Bangladesh, where average migration costs to migrate were 3000 USD in 2015, and the income distribution saw international migrants with \$3.552, internal migrants with 1.526 USD, and non migrant HHs with \$1.590<sup>1</sup> (Siddiqui and Mahmood 2015).

## 2.3 Financial Inclusion is an Enabler of Migration and Remittances

The literature first discusses the way in which financial inclusion leads to international migration. First, many studies suggest that microcredit is utilized by poor households to cover expenses during their migration initiatives (Bylander 2014; Alerigesane 2012; Stoll 2010). This is said to be a key factor for poor households and unemployed households (Bylander 2014). Sharma and Zaman (2009) show the division of financing sources for migration within Bangladesh, including that 16 percent of households used formal loans. Though they present data on formal loan migration financing in Bangladesh, their data is from 2009, and a picture of financing strategies ten years later is necessary. Adams et al. (2005) find that as communities experience international migration, the poorest income bracket will gradually find opportunities to send international migrants with the help of increased loan access.

Informal financing does facilitate international migration and it cannot be ignored. This is especially true when formal financial sectors are undeveloped, costly and therefore, far from the reach of poor households. Basa et al. (2012) display that informal loans from money lenders, friends and family leads to international migration, but at various levels of indebtedness because informal loans have a wide range of interest charges. Informal loans from money lenders are also

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<sup>1</sup> Conversion rate 1 USD = 83,94 BDT, August 29 xe.com

popular in rural areas because of the high transportation costs associated with finding a formal lender (Basa et al. 2012 and Ahmed 1989). As well, many papers display that international migrants are predominantly funded by their family ( Herman 2006; Sharma and Zaman 2009; Siddiqui and Mahmood 2015; Basa et al. 2012). The issue with family funding is it necessitates inequality, where only families with high savings are able to send migrants. As Adams et al. (2005) suggests, this social inequality calls for formal financing which is available to all parts of the economic spectrum. The Bangladesh Ministry of Expatriates Welfare and Overseas Employment has proposed such financing by initiating loans with lowered collateral requirements and low interest rates (BMET 2017).

While there is limited research on the spillover effects of loan enabled international migration, Bylander (2009) and Stoll (2010) show how the households utilize their new stable income of remittances, enabled by migration, to successfully apply for loans to invest in their household.

As well, there are negative impacts from international migration enabled by loans. Depending on economic cycles and labor market conditions, international migrant households face high risks of loan default. Stoll (2010) shows that low labor demand in the US has caused Guatemala migrant families to default on migrant loans and lose their houses in some cases. This is countered in Bylander (2009) where positive labor conditions in Thailand consistently lead Cambodia immigrants to find high paying jobs.

## 2.4 Nature of Remittances

The literature review will now focus on the impact of formal remittance channels on migrant remittances. This section will describe international remittance characteristics, differentiate formal versus informal remittance channels, and finally discuss the effect formal financial channels have on remittances received.

Yang (2011) defines remittances as “household income received from abroad” and suggests that remittances largely stream from international migrants. In Bangladesh, 2015 remittances from internal migrants were 73 percent lower than remittances from international

migrants (Siddiqui and Mahmood 2015). Remittances are also categorized as workers remittances or compensation remittances. Compensation remittances are predominate in Bangladesh; meaning that, workers spend a short time abroad and send their remittances home often (Yang 2011; De Bruyn and Kuddus 2005). Yang (2011) finds that Hispanic immigrants to the United States send remittances 15 to 17 times a year on average, and that the median remittance value is \$300.

Remittances can be sent by formal or informal avenues. Formal remittance streams include banks and money transfer services (Yang 2011). Informal remittances are transferred off-record by nonfinancial firms or migrants delivering the remittance in person (Siddiqui and Mahmood 2015, De Bruyn and Kuddus 2005). Informal remittances also exist as goods such as clothing, food, mobile phones, and cosmetics (Siddiqui and Mahmood 2015). De Bruyn and Kuddus (2006) suggests that total informal remittances roughly equal total formal remittances in Bangladesh. Freund and Spatafora (2008) report that recent worldwide remittance increases are partly influenced by dropping remittance sending costs, which result from increased technological advancements and competition in the financial services industry. Maimbo and Ratha (2005) claim that formal remittances lead to greater transparency, increased total remittances sent and higher savings and investment among migrants. They also suggest that formal remittance channels cause positive spillovers such as the usage of other financial services among low-income families. Formal remittances can also be a way in to get access to other financial services (Hernández-Coss 2005). Conversely, part of the literature suggests that informal remittance channels are popular in high cost contexts. Hernández-Coss (2005) report that informal remittance services within the Vietnamese-Canadian context are cheaper and more popular. Factors attributed to high formal remittance costs include limited competition, governmental remittance controls, fixed exchange rate costs, and a small market. and of formal remittance . Pieke et al. (2007) backs these findings by hypothesising that formal remittances are not more reliable than informal ones. This thesis will focus on whether there is a connection between the amount sent and the channel of sending.

Remittance fees are also suggested to increase informal remittance sending. Increasing informal remittance streams are likely to be caused by inefficient rent seeking among recipient country money transfer servicers. As well, informal remittance streams bypass formal banks, leading to a drop in financial services such as savings, and also provide inaccurate estimates for policy makers and their programs (Freund and Spatafora, 2008). Acknowledging the influence of remittance fees on formal remittances, policy makers should understand that the relationship between formal remittance channels and the number of remittances would be hindered by higher remittance fees.

## 2.5 Growth potential

As a notable channel, the financial sector serves both migration and remittance processes by formalizing money flows, financing options for migration and enabling cheaper remitting methods. It can also incentivize more remittances sent by providing migrants with a formal observation of the amount of remittances sent, new financial products for migrant and migrant families. As well ensure greater migrant control of the remittances, and ensuring more obvious trickle down effects of remittances. When observing the growth potential for financial development, aspects of the Solow model appear. Specifically, long term growth rates are projected by savings rate among the population. Due to rural financial formulation, more Bangladeshi households have access to both increased remittance receipts and new financial services, namely savings. This combination leads to higher savings rates with Bangladesh and heightens the country's production function. With the emergence of greater saving proportions, and the penultimate connection to borrowers via financial intermediaries, Bangladesh' steady state growth rate appears to rise (Rao and Hassan 2012). Within the Solow model, increased formalized remittances raises another aspect of wellbeing - consumption. According to Solow, the golden rule steady state levels occurs where consumption is maximized given the slope of the production and depreciation function. If Bangladesh is a country experiencing a short fall in consumption per person, an increase in the savings rate will increase the capital stock towards the Golden rule level (Mankiw, 2010). Development could lead to higher savings among low income households, raising the overall savings in a country and greater production possibilities. Moreover, financial sector development is tested by observing the benefits of financial inclusion for international migrants and their respective home communities, to both send migrants and

receive remittances, as well as harness the productive capacities of mainly migrant remittances in recipient communities to ensure growth in labor opportunities, human capital, consumption and savings behavior etc. Research displays a beneficial relationship between greater financial development/ inclusion for migrants and remittance receiving communities.

## 3. Hypothesis

Based on past research, we see that financial inclusion has a varied effect on of migration and remittances. Again, we want to ask, does financial inclusion affect international migration? Does financial inclusion influence the volume of remittances? We address these research questions with two hypotheses.

### *3.1 Financial Inclusion Leads to Migration*

When observing migration, the literature suggests that financial inclusion increases the ability to migrate. Bryan et al. (2011) discover a positive relationship between insurance products offered to households adverse to labor migration and the decision to temporarily migrate during a rainy season; furthermore, they discover that households which migrated have a high correlation with future migration decisions. Gibson et al. (2011) find that migration has a negative impact on financial use for the migrant family left behind, however, their conclusions do not suggest whether financial inclusion leads to migration. In result, we suggest that the use of financial products will increase decisions to migrate internationally. We decide to focus international versus internal migration because the data suggest that the households show significant differences in characteristics such as income. Our hypothesis follows:

Null-Hypothesis 1: Formal financial inclusion is uncorrelated with belonging to an international migrant household. The alternative hypothesis is a higher level of formal financial inclusion is correlated with an increase in the likelihood of belonging to an international migrant household.

### 3.2 *Financial Inclusion leads to more Remittances*

Research on remittances and financial inclusion displays that remittance senders react variably to formal remittance choices. Financial education on formal remittance channels leads remitters to select formal remittance channels over informal remittance methods; however, their results lack any conclusion on the relationship between formal remittance channels and the value of remittances sent (Yang 2011, Gibson 2012, Jamarillo 2008). Yang (2011) found formal channels to increase the frequency of remittances sent. Mohapatra and Ratha (2011) find that the expensive formal remittance channels in Sub-Saharan Africa lead remitters to choose informal remittance channels or even hand carry their cash. They also suggest that lowering remittance costs would lead to higher remittances sent. Gibson et al. (2006) suggests that a reduction in remittance costs would lead to a more than proportionate increase in remittances received in New Zealand. Given the significance of remittances and the lack of conclusions on the relationship between formal remittance channels and the value of remittances sent, this paper will search for a relationship between the use of formal remittance channels and the volume of remittances sent in Bangladesh. The second hypothesis follows:

Null-Hypothesis 2: The use of formal remittance channels has no correlation with the amount of remittances received by an international migrant household. The alternative hypothesis is that the use of formal remittance channels is correlated to a higher amount of remittances received by an international migrant household.

## 4. Data and Summary Statistics

The data utilized in this report is obtained from Siddiqui and Mahmood (2015) at the Refugee and Migratory Movements Research Unit. It was constructed using a series of surveys questioning Bangladesh migrants and their households. The main purpose of collecting the data was to fill in a void of quantitative data about migration work, and discover how migration and

remittances affects local development and poverty. The study collected data from 17 districts, with 9.946 households, including data from 4.663 international households, 2.782 domestic migrants households and 2.501 non-migration households.

The 64 districts of Bangladesh was segmented by the level of migrant outflow into low, medium and high intensity. And from these 64 districts, seventeen were randomly selected, satisfying four criteria to create the sample space. The criteria consisted of 1) representation of both low, medium and high intensity of international migration work, 2) representation of female international migration in at least two districts, 3) representation of at least two districts that has been affected by climate change 4) representation of at least two districts that experiences both international and internal migration. From the low and medium intensity areas of international migration work, four districts were chosen and in the high intensity nine districts in total. Two randomly selected groups in the high intensity had to be changed to satisfy criteria number 2, by the medium intensity there was one group that had to be changed to satisfy criteria number 3, and in the low intensity all criterias were accomplished. The main purpose of the study was to examine international migration compared to domestic migration and non-migration, therefore these two groups served as control groups. Every district in Bangladesh consists of sub-districts called *Upazillas* which are ranked by low, medium and high intensity of international migration. In each of the seventeen districts one out of the top three producing *Upazillas* was randomly selected. When seventeen *Upazillas* were chosen, the last grouping consisted of dividing the Union Councils within the *Upazilla* into low, medium and high intensity of international migration. And from the top four producing Union Councils, six villages were randomly selected to participate in the study, leading to a total number of 102 villages in the sample.

Ideally, data from 300 households in each district, with the division of 146 international migrants, 82 domestic migrants and 72 non-migrants, was to be conducted in the survey. However some districts chosen, did not have the amount required of internal and international migrants, therefore it was decided to keep the number of non-migrants at 72 and compensate eventual shortage of domestic migration with international one, and vice versa.

The questions that the data collectors wanted to answer also included the variation between gender, the debt situation for a international and internal migrant and the savings and investments pattern. More specifically it also covered questions concerning whether the household possessed agricultural or commercial land, educational level, age, the marital status and religion for each household member. For this research it becomes beneficial to use these individual variables as controls, keeping the formal financial institutions as independent variables.

The *Dependent Variables* in this thesis was formed to highlight the importance of international migration, this in order to differentiate the two different migrant groups and their following different characteristics. The first regression addresses the hypothesis concerning the impact of financial inclusion on migration households. The dependent variable measures is if the respondents' household had at least one international migrant in the family. The second regression addresses the hypothesis concerning if financial inclusion affects the amount of remittance sent. The dependent variable registers the total remittances received by the respondent's household. Table 1. in the appendix provides summary statistics of the dependent variables

The *Independent Variables* for the first regression correspond to the first hypothesis - if there is a correlation between financial inclusion and status of migrant. These consist of six different independent dummy variables representing if the respondent's household holds a (I) bank account (II) savings account (III) monthly deposit account (IV) insurance account used as savings (V) savings account at government cooperative (VI) fixed deposit account (VII) savings certificate at bank, postal office or savings institution. The *Independent Variable* for the second regression corresponds to the second hypothesis, concerning whether there is a correlation between financial inclusion and the amount of formal remittance sent. Five independent dummy variables were constructed, asking how much remittances the respondent's family received through (I) a cheque/ demand draft (II) bank account to bank account (III) exchange house to



bank account (IV) internet banking method (V) mobile banking method. Table 2. in the appendix provides summary statistics of the independent variables.

The *Control Variables* consisted of 24 different variables, some of them dummies and some categorical. The bias we wanted to limit could come from the district of origin, the level of education and age of first employment, the religion practiced, gender and also the marital status. Variables that also could create a bias would be the households income and debt, if they own land such as agriculture, commercial or homestead land and if they in any way used informal banking services or saved money at home. Table 3 in the appendix provides summary statistics of the control variables.

## 5. Methodology

We examine the correlation of financial inclusion and the likelihood of belonging to an international migration household through the OLS method. The likelihood of belonging to an international migration household is measured by individuals who are migrants or belonging to the house of an international migrant. The inverse of the international migrant variable is an internal migrant household. Financial inclusion will be measured through dummy variables that indicate whether an individual's household hold a financial account such as a savings or bank account. The first regression is provided below, and the definition of variables is listed in the appendix (Table II).

$$\Delta \text{International} = \beta_0 + \beta_1 * \text{Bank Account} + \beta_2 * \text{Savings Account} + \beta_3 * \text{Deposit Savings Account} + \beta_4 * \text{Insurance Savings Account} + \beta_5 * \text{Fixed deposit Account} + \beta_6 * \text{Certificate Account} + \beta_7 * \text{Government Co-Operative Account} + \beta_8 * X + \mathcal{E}$$

Next, a second OLS regression analysis is conducted to discover the correlation between sending remittance by formal channels against remittances received from an international

migrant. The inverse of the regression is remittances received from an internal migrant. The regression is provided below, and the definition of variables is listed in the appendix (Table II).

$$\Delta \text{ International Remittances} = \beta_0 + \beta_1 * \text{Cheque} + \beta_2 * \text{Bank Remittances} + \beta_3 * \text{Exchange House Remittances} + \beta_4 * \text{Ebank Remittances} + \beta_5 * \text{Mobile Remittances} + X * \beta_6 + \varepsilon$$

We run three different versions of each regression, one only with the independent variables, one including all controls minus districts and a third regression controlling for the inward effect in each district. The third regression is added due the possible high influence of a district. The controls are added to overcome endogeneity between the explanatory variables and unexplained variables, and are labeled X within each regression. In the international migration regression the controls include informal measures of financial inclusion, and within the remittance regression, the controls include informal remittance channels. For both regressions, the X variables also encompass a variety of individual and household characteristics as well as districts.

This paper intends the OLS estimates in the regression to be interpreted as correlations, as reverse causality would be difficult to disprove. For instance, where international migration and international remittances, could affect the use of formal finance and remittance methods. To avoid claiming causation, a correlation analysis will be conducted using OLS. OLS also pledges our case since our dataset is from a random sample and therefore homoscedastic and have no autocorrelation. To minimize the bias, we will pick out potential endogenous factors that might affect our result, called control variables. Beyond this, we assume the remaining variables are exogenous.

## 6. Results

Table IV shows that an individual with formal finance is positively correlated with the likelihood of belonging to an international migrant household. The first column displays that

holding a bank account and a savings account is correlated with an 11 percent and 23 percent likelihood of belonging to an international migrant household, respectively. Column 2 shows that the inclusion of informal financial controls and various individual characteristic controls reduces the positive coefficients for some of the formal financial inclusion variables. Note that the coefficient for bank account remains at 11 percent, however, the coefficient savings account reduces to 14 percent and the coefficient for fixed deposit account becomes negative. As well, the estimates for informal financial inclusion initially suggests a varying correlation between informal finance and belonging to an international migrant. For instance, savings account at NGO has a negative coefficient estimate while informal savings and savings at home have a 3.5 percent and 7.1 percent positive coefficient, respectively. However, column 3 includes dummy variables for districts, and with this addition, the positive coefficients for informal finance become negative or insignificant. Unlisted other types of savings is the only informal coefficient that includes a positive, significant result after the addition of districts. In column 3, the coefficient for bank account reduces to 9 percent, and the coefficient for fixed deposit account becomes insignificant. Also notice that the standard errors reduce with the addition of districts. The estimates in Table IV permit the rejection of the first null hypothesis; therefore, formal financial inclusion is concluded to correlate with belonging to an international migrant household.

Table V suggests that sending remittances using a formal financial channel is correlated with an increase in the amount of remittances received by an international migrant household in Bangladesh. Column 1 shows that using formal chequing accounts is correlated with a \$996,54 increase<sub>2</sub> in the remittances received by an international migrant household. As well, notice that the coefficient estimates for ebank and mobile remittances are insignificant. Column 2 controls for the effect of informal remittance channels and various individual characteristics. With this addition, the formal channel coefficients all decreased and the informal channel coefficients displayed a significant positive coefficient. For instance, the cheque channel coefficient decreased to \$907,88, and the hundi remittances coefficient is \$1.327,34. . Column 3 adds districts which induces a decrease in the formal channel estimates, such as cheque channel dropping to \$910.42 . The addition of districts increased the estimates of hundi remittance

channels to \$1.354,43. The positive correlation of formal channels on remittances supports the second, alternative hypothesis. Formal channels are concluded to correlate with increased remittances. However, that claim is not concurrent with the electronic remittance channels, ebank remittances and mobile remittances. The positive results for informal remittance channels suggests that informal channels are correlated with increased remittances. According to informal remittance channels, the second null hypothesis cannot be rejected and informal remittances are concluded to correlate with an increase in remittances.

## 7. Discussion

From the results we first discuss the relationship between financial inclusion and international migration. According to the first research question, we conclude that financial inclusion does correlate with international migration. For instance, the results indicate that having greater formal savings is correlated with an increase in the probability of belonging to an international migrant household. The interpretation is that higher savings is attributed to lower consumption and higher spending on investment opportunities. Migration is a prominent investment opportunity for communities with poor investment climates, so an increase in migration investment could follow (Karlan 2014; Bylander 2009). Additionally, the correlation between bank account ownership and belonging to an international household has beneficial implications for formal migration financing. Primarily, we suggest that having a bank account ensures that families will have a way to receive remittances, which is a primary motivation for sending migrants. In terms of financing migration, holding a bank account provides individuals with access to loans to cover the costs of migration. According to Sharma and Zaman (2009), Bangladeshis claimed that 16 percent borrowed from the finance market to cover their migration costs. The bank account result coincides with Sharma and Zaman, showing that formal finance makes up a moderately low proportion of financing strategies among Bangladeshis. As mentioned in the results we reject the Null-hypothesis and concludes that there is a correlation between the status of migrant/non-migrant and the level of financial inclusion.

Next, we discuss the varied correlation of informal finance and international migration. Most clearly, it seems that informal finance is less important for international migrant households, as the results were insignificant when controlling for districts. Perhaps this means that in Bangladesh, NGO microfinance savings is not attractive to international migrant households. As well, the negative coefficient for savings at home possibly suggests that household savings are less productive in terms of investing in international migration. The only positive correlation between informal finance and belonging to an international migration household is via the “other savings” variable. However, this variable is a catch all for uncategorized forms of saving methods, and claiming a unified relationship between informal savings and international migration is difficult. This paper concludes this relationship means that international migrant households are using many unique informal informal savings mechanisms, so we cannot disqualify the importance of informal finance. Since 75 % of the male and 90 % of the female international migrants took a loan to fund their migration our interpretation is that savings can take various forms and individuals are likely to be creative in forming savings.

Observing the positive correlation between formal and informal remittance methods with international remittances, it seems that the remittances in Bangladesh are serviced by many channels. Perhaps this is because of unequal access to formal remittance services. The lack of bank locations and internet access could attribute to this issue. As well, the traditional remittance service, hundi, could be used out of habit even if it is more costly. The non electronic remittance channels show a positive correlation with international remittances. This partly addresses the debate over whether cheaper formal channels lead to more remittances, if we assume that the formal channels being used are actually cheaper than remittances. However, no addition of remittance fees were used in the regression, so these inferences are hypothetical. The insignificance of electronic remittance channels was quite surprising. Since electronic remittance channels are expected to be cheaper, the literature suggests that these channels would lead to more remittances (Gibson et al. 2012). However, Gibson et al. also note that the use of formal electronic remittance methods adaptation was low among international migrant populations due to low awareness. As mentioned in the results, this paper rejects the second Null-Hypothesis for

formal, traditional transferring methods, and we conclude that the usage of these channels correlates with a higher amount of remittances received. However, we claim no causality as many unexplained variables could be causing higher remittances. For example remitters using formal remittance channels could be in a better position from start, leading them to get higher wages and therefore are able to send more remittances home. This could also be due to higher financial literacy or better bargaining power in unobserved components such as work contacts or personal ability and motivation.

Regarding microfinance, the results suggest that microfinance savings is negatively correlated with international migration numbers; however, the remittance channel facilitated by microfinance firms are positively correlated with international remittances. As past research asserts, microfinance has an unclear effect on development. It appears that the different micro finance

## Conclusion

After taking the results into consideration we have drawn the following conclusions. Policy measures to increase financial coverage within Bangladesh would enable migration and remittance sending. This would benefit both local-level and macro-level development. Policy recommendations would include lowering interest rates and collateral requirements for low income borrowers; establishing more banks; improving transportation and internet infrastructure to increase access to both physical and electronic banking services; launching financial education initiatives aimed at increasing awareness of cheaper, formal remittance channels;

Next, this paper suggests that informal financial inclusion has varying effects on migration and remittances, and further analysis is necessary. This is apparent because informal finance is utilized by many households, and any hasty policy actions opposing informal finance may damage migration and remittance efforts. Attention should be placed on opportunities which would be favorable for all types of people to switch from informal to formal finance methods. As

the the results suggest that remittances are being sent using informal channels, policy makers should look to ways in which informal and formal remittance channels can coexist.

## Recommendations

This paper suggests that far more research opportunities are necessary for understanding the relationship between financial inclusion and migration and remittances. For instance, this study would have enjoyed to understand the relationship between remittance fees and the volume of remittances sent home. Remittance fee research is unsettled, with conclusions varying depending on the countries of migration (Yang 2011, Spatafora and Freund 2008, Gibson 2010). One study by Sharma and Zaman (2009) found average remittance values and frequencies to be quite different in Bangladesh than in the Central America to USA migration context. Given the quality of the 2017 remittance data from the RMMRU, additional remittance fee research would clarify findings by Zaman and , as well as open up inquiry as to why remittance behavior is different in Bangladesh. Perhaps one answer would be remittance fees in Bangladesh.

Other research ideas could be whether financial inclusion can facilitate safer and easier migration than self financed migration. This is necessary since migrants without funds may be forced to take dangerous migrating strategies. As well, researchers should consider ways in which financial inclusion can enable migration fueled investment. Other topics include how migration and remittances assists victims of climate change and natural disasters.

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# APPENDIX

Table I. Dependent Variables

Variable	Description	Observations	Mean	Std Deviation
International	Dummy Variable. The respondent's Household has at least one international migrant*	20.609	0.649	0.477
International remittances	Total remittances sent by an international migrant	20.609	23323,67	93646,08

\*The total number of international migrants in the data were 2,964 and with the corresponding household to the international migrant it covered 13,383 people. The number of internal migrants covered 1,880 and with their corresponding family the data set covered 5,730 individuals. For the families without any migrant the dataset covered 5,730 individuals

Table II. Independent variables

Variable	Description	Observations	Mean	Std. dev
Bank Account	Dummy Variable. The respondent has a formal bank account	26.339	0.141	0.348
Savings Account	Dummy Variable. The household has a savings account	20.609	0.221	0.415
Monthly Deposit Account at Financial Institution	Dummy Variable. The respondent's household holds a monthly deposit account at a financial institution	26.339	0.125	0.331
Fixed Deposit Account	Dummy Variable. The respondent's household holds a fixed deposit account at a financial institution	20.609	0.038	0.191
Insurance Account	Dummy variable. The respondent's household holds insurance as savings	20.609	0.094	0.290
Certificate Account	Dummy Variable. The respondent's household holds a savings certificate at a bank, postal office, or savings institution	20.609	0.005	0.071

Government Co-Operative	Dummy Variable. Savings account at a Government co-operative	20.609	0.003	0.050
Cheque	Dummy Variable. Money remitted home through a cheque/demand draft.	26.339	0.004	0.060
Bank Remittances	Dummy Variable. Money remitted home through bank account to bank account	26.339	0.057	0.231
NGO Exchange House Remittances	Dummy Variable. Remittances through NGO exchange house	26.339	0.008	0.092
Exchange House Remittances	Dummy Variable. Money remitted home through a exchange house to bank account.	26.339	0.002	0.04
Ebank Remittances	Dummy Variable. Money remitted home through internet banking method	26.339	0.000	0.019
Mobile Remittances	Dummy Variable. Money remitted home through mobile banking method	26.339	0.047	0.213

### Table III. Control variables

To limit the bias, we have chosen to include the listed variables below. For further explanation about why these variables are put as control see list below with the corresponding number to the right of the column.

Variable	Description	Observations	Mean	Std Dev	Nm
Savings at Home	Dummy Variable. The respondent has savings at home.	20.609	0,056	0,229	1
Savings Total	Total number of savings in a household	26.339	60443.13	227139.7	
Informal Savings	Dummy Variable. The respondent has informal savings.	20.609	0,095	0,293	
Savings Account at NGO	Dummy Variable. Savings account at an NGO	20.609	0,010	0,100	
Unlisted *other* Savings	Dummy Variable. The respondent has other informal savings	20.609	0,045	0,208	

Bus Remittances	Dummy Variable. Received Remittances through bus system	26.339	0,000	0,015	2
Hand Carried Remittances	Dummy Variable. Received Remittances hand carried.	26.339	0,030	0,169	
Friend Remittances	Dummy Variable. Received remittances through friend	26.339	0,010	0,101	
Hundi Remittances	Dummy Variable. Received Remittances through hundi system	26.339	0,014	0,118	
Instant Cash Remittances	Dummy Variable. Received Remittances through instant cash.	26.339	0,024	0,153	
Mobile to Mobile Remittances	Dummy Variable. Received Remittances informal mobile to mobile	26.339	0,006	0,025	
NGO Exchange House Remittances	Dummy Variable. Received Remittances through NGO.Exchange	26.339	0,008	0,092	
Agricultural Land	The respondent's household has X sq meters of agricultural land	26,334	35,575	93,715	3
Commercial Land	The respondent's household has X sq meters of commercial land.	26,339	0,303	3,350	
Homestead Land	The respondent's household has X sq meters of homestead land.	26,339	15,220	20,577	
Debt	Dummy Variable. The respondent has debt.	26,339	0,424	0,494	4
Female	Dummy Variable. Is the respondent female	26,339	0,471	0,499	5
Child	Dummy Variable. Is the respondent a child, age 0 - 15	26,339	0,271	0,444	6
Young Adult	Dummy Variable. Is the respondent a young adult, age 16 -20	26,339	0,079	0,269	
Adult	Dummy Variable. Is the respondent an adult, age 21 - 65	26,339	0,572	0,495	
Mature	Dummy Variable. Is the respondent elderly, age 66 - 80	26,339	0,078	0,269	

HH Income	Respondent's household income	20,609	240017,900	270574,500	7
Married	Repondent is married	26,339	0,088	0,283	8
Religion					9
Hindu	Repondent is Hindu	20,609	0,053	0,224	
Christian	Respondent is Christian	20,609	0,001	0,031	
Education					10
<Class 5		23,99	0,349	0,477	
<Class 10		23,99	0,247	0,431	
SSC		23,99	0,076	0,265	
HSC		23,99	0,044	0,205	
Undergrad		23,99	0,019	0,137	
Masters		23,99	0,006	0,075	
Other		23,99	0,003	0,051	
DIST					11

## Description of Control variables

### 1. Informal savings

Informal savings can have an impact on the migrants financial situation. With more informal savings, the household or individual can have less formal savings, which is one of the independent variables. The informal savings include Informal Savings, Unlisted "other" Savings, Savings Account at NGO and Savings at Home.

### 2. Informal methods of sending remittances.



Informal way of sending remittances, if the migrant is sending more remittances through informal ways, we expect the migrant to send less formal remittances. Therefore these variables are put as control in the regression where remittances are measured.

### *3. Ownership of land*

Ownership of land in village, agricultural land or land for commercial use. These variables serve to control the effects that it can have on the migration status. If the household owns a shop, there might be less incentives for going for migration work. But also, owning a shop might give the opportunity of having a loan in the sense of collateral.

### *4. Debt*

Debt is also included in the regression as a control variable. Households or individuals who have a lot of debt can either be more financially included but less likely to go for migration work, the loan was maybe taken to finance the buying of land or a shop. Or more likely to go for migration work since there is a need of repaying the debt.

### *5. Gender*

Gender can be an important factor in the choice of who in the family is going for migration work. In most cases, the man is more likely to work and that also affects the number of men versus women who is leaving for migration work. The woman is still in many cases more likely to stay at home and take care of children and home, while the man and fathers of the families have to be the breadwinners. In the regression, we added male as comparison group and female as treatment group.

### *6. Age*

Age can decide the individual's ability to work, we included the variable based on the question "At what age did you start paid employment?" The answers were categorized into three groups, child 6-15 years, young adult 16-20 and above 21-80 years was categorized into adult. If the individual started working at young age, the person is less likely to come from a wealthy family and less likely to have a higher education, this lowers the ability of going abroad for migration work but not necessary domestic migration work.

### *7. Income of Household*

Household income is an important determinant for whether the individual is able to go abroad or not. If the income is low, then the incentives are high to migrate, but also, if the migrant does not earn much they might not afford their expenditures. A higher income lowers the incentives to migrate, but it is also easier to fund their travel.

### *8. Marital status*

Marital status, family and relatives can have an impact on the potential migrant. Having a partner, kids and elderly to take care of can both have higher incentives of going for migration work to feed the family, but also lower the incentives since the individual would prefer to be at home and look after the family. Married is put as treatment group and not married as comparison group, the unmarried includes single, widow/widower, separated, divorced and individuals under the marriage age, which is 18 for females and 21 for males.

### *9. Religion*

Religion is put as a control variable, culture and traditions can impact the opinion about the effectiveness of migration work. About 90% of the interviewed in the data come from a muslim homes and is therefore put as the comparison group. Christian and Hindu are put as the treatment group.

#### *10. Educational Level*

Educational level can affect the incentives of leaving for migration work. If the migrant have a higher level of education they might be able to migrate abroad in a larger extent since there is a higher understanding of the financial advantages of going abroad and better knowledge of language. But on the other hand, among skilled or professional individuals there is lower unemployment and therefore going abroad can be seen as a less attractive solution compared to low skilled workers, who faces high unemployment and low wages. Past researchers find the predominate proportion of International Bangladeshi migrants to be low skilled, around 73 percent, and exhibiting low skill growth compared to nations which send migrants to similar destination countries(Siddiqui and Mahmood 2015, Sharma and Zaman 2009).

#### *11. District of origin*

District where the migrant is from is chosen as a control variable. Culture, accessibility and norms can have effects on both the level of financial inclusion as well as the willingness of going for migration work.

### Table IV Financial Inclusion on International Migration

OLS Regressions results. International Migrants Versus Internal Migrants Against Financial Inclusion

VARIABLES	(1) Only Var. of Interest International	(2) Including Controls International	(3) Including District effect International
Bank Account	0.110*** (0.009)	0.110*** (0.009)	0.073*** (0.008)
Savings Account	0.230*** (0.008)	0.142*** (0.008)	0.099*** (0.007)
Monthly Deposit Account at Financial Institution	0.156*** (0.009)	0.071*** (0.009)	0.057*** (0.008)
Fixed Deposit Account	0.091*** (0.017)	-0.080*** (0.017)	-0.012 (0.016)
Insurance Account	0.028** (0.011)	0.017 (0.011)	0.034*** (0.010)
Certificate Account	0.357*** (0.045)	0.347*** (0.045)	0.192*** (0.040)
Unlisted "other" savings		0.112*** (0.016)	0.105*** (0.014)
Savings Account at NGO		-0.177*** (0.014)	-0.098*** (0.012)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Table V Financial Inclusion on Remittances

The amount of formal remittances received by household of international migrant.

VARIABLES	(1) Only Experimenta l Variables	(2) Including Controls	(3) Including Districts
	International Remittances	International Remittances	International Remittances
Cheque	83,044.842*** (7,287.168)	77,656.304*** (7,021.533)	75,868.731*** (7,026.784)
Bank Remittances	187,279.375*** (1,928.013)	167,015.277*** (2,014.492)	168,650.307*** (2,013.093)
Exchange house Remittances	166,118.338*** (11,043.084)	139,433.316*** (10,680.875)	141,790.730*** (10,672.338)
NGO Exchange House Remittances	171,017.117*** (4,809.561)	159,465.131*** (4,703.597)	158,307.018*** (4,721.114)
Instant Cash Remittances	142,936.432*** (2,909.058)	128,671.159*** (2,856.446)	128,863.776*** (2,856.039)
Ebank Remittances	-3,677.758 (22,519.129)	-660.023 (21,642.154)	2,625.596 (21,588.574)
Mobile Remittances	-3,048.830 (2,080.357)	1,239.946 (2,271.439)	-1,513.507 (2,311.644)
Hand Carried Remittances		687.673 (2,818.701)	682.200 (2,833.562)
Hundi Remittances		110,611.533***	112,868.994***

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

\* The regression is done in three steps. First remittances is tested

Table VI Summary of financial status among HH

	International migrant HH	Internal migrant HH	Non- migrant HH
HH below poverty line	13%	46%	40%
HH Income	3.552,27	1.526,21	
Total savings	111.321,5	14.142,95	21.333,33
Bank account	30 %	10 %	8 %
Percentage of migrants that took loan migration	75% (male) 90% (female)	15 % (male) 12 % (female)	

## Clarification

A clarification to the data responses is that most often each member of the household was interviewed and gave responses to each question. This clarifies that different individuals from the same household will have equal responses to some questions that may only be relevant for the whole household. For instance if one house has five members, and each person was asked how much land they own, each answered the total land size held by their household. For instance, a five member family all answered “65 sq meters” of land, and even though they are all individually counted, there will essentially be 5 people with 65 sq meters of land for all purposes in our analysis. This is an overstatement; therefore, each variable should be understood as, how many individuals have at least one family member with the variable in question. Applied to the number of international migrants in our sample, the sample really lists all household members of each randomly chosen household that does or does not include at least one international migrants. Therefore our variable, intl, actually lists 13,383 people part of a household containing

at least one current or returnee international migrant. There are not 13,383 individual current or returnee migrants international represented in our data.

Rather the variable, MS contains the exact number of migrants within a household that are migrants. The data show there are 2,964 international migrants, current or returnee, in the sample.

### *Method of Remitting Money*

New variables called cheqchan, bankchan, etc. were created using the stata function rowtotal. First, three variables which respondents provide their top three methods of remitting money, were expounded into separate variables. Then those different remittance methods were totaled. Because of issues with survey taking, where the surveyor recorded the same method twice for the same observant, et. recording one respondent to claim Hundi as the top method of remitting money twice. This is done mainly for our regression where various remittance methods are regressed against intl migration. Since the channel variables are dummies, the double counting within the original S3Q31 survey variables, causes the channel variables to have 0,1,2 as values, which is understandably nonsensical.

### *Education*

The variable education includes seven responses. There were 2,349 missing values which makes the total observations for the regressions to drop from 20,604 to 18,799. We decided to keep these missing values instead of make them 0 since it is impossible to decide whether the missing obs has education.