Journal of Population and Social Studies, Volume 25 Number 1 January 2017: 11-25
DOI 10.14456/jpss.2017.2

# Predictors of Investment Expenditure from Foreign Remittances in the Sylhet Region of Bangladesh: A Household-Level Analysis

Md. Zakir Hossain[1], Jasim Uddin Ahmed[2] and Sabbir Tahmidur Rahman[3]

*Remittances, the most explicit outcome of international migration, play a vital role in the socioeconomic development of Bangladesh. The optimum allocation of these scarce resources is of utmost importance for intergenerational consumption smoothing. This study explores the household-level factors of spending remittances in different investment sectors. The study uses a primary dataset from a field survey covering 500 migrant and 250 non-migrant households from 30 clusters of the Sylhet region of Bangladesh. Results indicate that total household income, ownership of residence, asset score, operative land, household size and economic dependency ratio are the significant determinants for investment in an absolute sense. The models for identifying the predictors in different investment sectors suggest that household income, ownership of residence, asset score, education of the household head and household size are common determinants for all the sectors. Substantial investments in different sectors may be determined by several predictors, such as household income, ownership of residence, asset score, education of household head and household size.*

***Keywords:*** *Remittance; household determinants; investment expenditure*

## Introduction

It is well documented that migration is a strategy for gaining wider opportunities for a better life and livelihood, and that migration functions simultaneously as cause and effect of socioeconomic development, particularly urbanization (Quibria, 1986; Russel, 1986; Swamy, 1981). This function is at both the national and international levels. History reveals the movement towards better life and livelihood provided by the nature from far and nearby places through migration. The same thing happens at present and will continue in the future.

Bangladesh has a long history of international migration. Some people migrated to the United Kingdom and the United States for trade and higher study during the British rule. After the independence of Bangladesh, the flow of migration to other countries, mainly Middle Eastern countries, increased remarkably. At present, two types of international migration occur from Bangladesh: the first takes place mostly to the industrialized West and the other to Middle Eastern and Southeast Asian countries. Migration to the West includes permanent residents, immigrants, work permit holders and professionals. These migrants are usually perceive as long-term or permanent migrants. By contrast, migration to the Middle East and Southeast Asia

[1] Department of Statistics, Shahjalal University of Science & Technology, Sylhet, Bangladesh.
[2] Department of Business Administration, North East University Bangladesh, Sylhet, Bangladesh.
[3] Department of Statistics Shahjalal University of Science & Technology, Sylhet, Bangladesh.
Email: sabbi_01@yahoo.com

Published online: 29 December 2017

are usually for short-term periods. These migrants typically return home after finishing their contracts of employment in the host countries.

International migration is increasingly being recognized as a viable livelihood option and one of the major development issues for Bangladesh. Foreign remittances, the most tangible outcome of international migration, contribute significantly to the income of Bangladeshi households. In 2012, Bangladesh earned about USD 14.1 billion, which accounted for less than 21% of total remittances earned by India in the same year. Bangladesh ranked eighth in 2012 globally as a remittance-receiving country (World Bank, 2014).

According to the International Organization of Migration (2010), remittances from Bangladeshi migrants have been seen to grow at an average rate of 17% since 2001 and reached a record high of approximately USD 11 billion in 2010. Adams and Page (2005) and Newland and Patrick (2004) document the contribution of international remittances to socioeconomic development, including poverty reduction in the recipient households in Bangladesh, These studies do not explore macro implications, such as impact on trade balance and foreign exchange reserve of the country. In another study, Hossain, Kazal and Ahmed (2014) explored the impact of internal rural-urban migration on food security of the recipient households. The research team found several positive impacts of internal migration. It is documented in the report of the Household Income and Expenditure Survey – 2010 that 8.6% of households in rural Bangladesh receive international remittances (Bangladesh Bureau of Statistics (BBS), 2011). The strong and extensive altruistic Bangladeshi diaspora transfers an average amount of BDT 151,890 (approximately USD 1,935) in the form of remittances to their kith and kin in one way or another for several reasons (BBS, 2011). Therefore, migration and remittances play a vital, intertwined role to transform the socioeconomic condition not only of the receiving households, but also of the community as a whole by spillover and round effects. This means that migration generates remittances as unearned income for the left-behind households and this income is used for both consumption and investment spending for the socioeconomic development of the households and the communities. The remittances are also used to finance further migration that generates more remittances, continuing this process.

A number of studies about foreign remittances flow focus on the uses of these transfers with the help of descriptive statistical tools and techniques. The studies explore the spending pattern of remittances at the household level and find that the beneficiaries spend the remittances mostly in housing and/or land purchasing (Adams & Cuecuecha, 2010; de Bruyan & Kuddus, 2005; Glytsos, 1993; Murshid, Iqbal & Ahmed, 2002; Siddiqui & Abrar, 2001). Alternatively, some studies discover that a substantial portion of remittances is spent for meeting daily expenses of households (Drinkwater, Levine & Lotti, 2002). It is evident that a lack of viable avenues for investment along with a lack of sound law and order are the main constraints to more productive investment. These abovementioned studies conclude that remittances play a vital role in the socioeconomic development process of the international migrant-sending households. The limitation of these survey-based studies is that the sample size is not large enough to draw strong conclusions on the pattern of the utilization of remittances at the household level.

By developing a simple macroeconomic model, Moniruzzaman (2009) attempted to assess the macroeconomic implications of foreign remittances in the Bangladesh economy by analyzing the volume and magnitude of remittances of migrant workers and their impact on macro variables such as consumption, import and cumulative gross domestic investment of the country. Based on the secondary macro time-series data (1976-2006), the study found that remittances fluctuate pro-cyclically and have a significantly positive impact on the concerned

macro variables. Also using macro level data, Mahmud and Osmani (1980) focused on the impact of remittances on income, savings and the foreign exchange market in Bangladesh through cost-benefit analysis of workforce export from Bangladesh to the Middle East. The study concluded that remittances are deemed an income augmenting means in Bangladesh. In another study, Uddin (2011) investigated the allocation and utilization pattern of remittances to discover its impact on women's empowerment in rural Bangladesh, based on data collected from 750 rural households. The study found that families use remittances for investments, allowing receiving households to behave differently than their non-receiving counterparts as far as spending and saving. The investments also create privileges for married women by empowering them, which has psychological impacts within households and throughout the society as a whole. Turning to a different part of the world, Fayissah and Nsiah (2010) explored the aggregate impact of remittances on economic growth within the conventional, neoclassical growth framework using panel data spanning from 1980 to 2004 for 36 African countries. The study revealed that remittances have a positive effect on economic growth by providing an alternative way to finance investment and helping to overcome liquidity constraints. Baldé (2010) examined the effectiveness of remittances and foreign aid in promoting savings and investment in Sub-Saharan Africa and found that remittances play a significant role to boost the investment in an aggregate sense. The existing pieces of literature do not address the predictors of spending remittances in different investment sectors at the household level. Rather, they explore either the utilization pattern or impact in aggregate.

The Sylhet region in Bangladesh occupies the topmost position in terms of sending international migrants, particularly to countries outside Asia. The contribution of the migrants of the Western world is very much significant to Bangladesh's national economy, not only through remittances but also in other ways. Anecdotal evidence suggests that the migration picture in the Sylhet region is changing rapidly regarding the destination of migrants. In the recent past, a very significant number of households were accustomed to sending migrants to Middle Eastern countries due to the limited opportunities to send them to Western countries. It is expected that the trend of sending migrants towards Middle Eastern countries will continue for a long time. Despite the apparently splendid socioeconomic development in Bangladesh, particularly in the Sylhet region, the population has yet to launch a strong ground for long-term and perpetual development through industrialization and human capital formation by using remittances. A recent study documented that the contribution of remittances to capital formation in the Sylhet region was not up to the mark (Hossain, Kazal & Faisal, 2010). It is immensely important to allocate an optimal amount of remittances in investment for sustainable economic growth and intergenerational consumption smoothing. Therefore, an intensive study is essential to explore the investment pattern of remittances by analyzing its allocation pattern as well as determinants of investment. This study analyzes household-level factors of spending remittances in different investment sectors while identifying the factors influencing the substantial amount of remittances in investment in different sectors.

## Data and Methods

The research site of the study is the Sylhet division, one of seven divisions in Bangladesh. It is located in the northeastern part of country about 300 kilometers from Dhaka, the capital city. The data for this study was collected under the research project "International Migration and Household Investment Behaviour of Remittances in Sylhet Region of Bangladesh," sponsored by the University Grants Commission of Bangladesh (Hossain, 2015).

## Sample design

The study conducted a household survey to assess the performance of investment of remittances at the household level in different sectors. Data was collected from 30 clusters (Primary Sampling Units of Bangladesh Bureau of Statistics) of Sylhet. The clusters were selected from the newly prepared list of primary sampling units (PSUs) of the Bangladesh Bureau of Statistics (BBS). It is to be noted that there are 161 PSUs in Sylhet Division and there is no urban-rural divide in the new list of PSUs of BBS. Knowledgeable persons from each respective cluster were asked to provide their perception of the concentration of remittance-receiving households in their community. Then a scale of 1 to 100 was assigned to each sampling unit based on the concentration of remittance-receiving households of that PSU, rated on the basis of key informants' perceptions and anecdotal evidence. Systematic probability proportionate to size (PPS) methods were then used to select the clusters, using the 1 to 100 scale as a weight on the population. Then the units of analysis (migrant and non-migrant households) were selected randomly.[4]

Following the recognized sample size determination formula[5], the required number of sample households was found to be 507 with 50% indicator percentage, 95%, confidence interval and assumed design effect 1.32. For comparison of different indicators, 210 non-migrant households were also covered as controls. Finally, 17 international migrant-sending households and 7 non-migrant households were selected from each cluster, totaling 510 migrant and 210 non-migrant households.

***Who are migrants***: For this study, the households having any international migrants for at least 12 months at the time of the survey (June-September 2014) were considered migrant households. However, the migrants had to maintain a close relationship with the left-behind household members. Households with complete migration—migration of all members of the family—were excluded from the survey. On the other hand, households with no migrant members are considered as non-migrant households. As this study aims to explore the household-level factors of spending foreign remittances in different investment sectors as well as to identify the factors influencing substantial amount of foreign remittances in investment in different sectors, non-migrant households are not included because they do not generally receive any kind of remittances.

## Analytical Techniques

The study used several descriptive and inferential statistical tools and techniques to analyze the data. In particular, classical regression and binary logistic regression have been employed to determine the predictors of specific expenditure of remittances on different heads of investment.

Since the first dependent variable (amount of investments from remittances) is a continuous variable with a ratio scale, the classical regression model is appropriate. Categorical predictor variables were transformed into dummy variables. Thus, the determinants of investment of

[4] The pencil spin method was used to select households. In each selected cluster, the interview team starts at a central point, selects a random direction from that point ('spinning the pencil'), and chooses a dwelling at random among those along the line from the center to the edge of the community.

[5] $n = p(1-p)(z2/e2)*Deff$ ; where p=proportion of an indicator = 0.50, Z=1.96 (normal variate value at 5% level of significance), e= 0.05 (amount of admissible error), and Deff=1.32 (assumed design effect).

remittances in different sectors are identified in an overall and absolute sense by applying multiple classical regression models.

For every remittance-receiving household, the percentage of expenditure from remittances in each category is determined, from which it is possible to calculate an average percentage of expenditure from remittances for each category. The goal is to determine the factors which are possibly responsible for those spending an above average percentage of expenditure from remittances, which we call a substantial portion, in each sector/category. The dependent variable is created as households having more than average percentage of expenditure from remittances coded as 1 and 0 otherwise for running the logistic regression. Here the percentage of remittances above the mean value is coded "1" to indicate the substantiality. Thus, the findings of the multiple logistic regressions provide the likelihood of more investment of remittances rather than investment of remittances only.

## Results and Discussion

Unlike the usual categorization of occupation, here the categorization is based on the efficiency/skill of the laborer. Those who had special skills, training and knowledge about their work were categorized as an "efficient laborer"; a "half efficient laborer" is one who does work that has a defined routine, does not include decision making and would need more training for self-development. In addition, laborers with no educational and training background were considered as "inefficient". In this study's profile of migrants, 21% were found to be efficient laborers at the destination while about 20% and 10% were considered half efficient and inefficient respectively. Only 13% of the migrants were found to be involved in recognized jobs at the destination. The findings of the study are categorically discussed in terms of expenditure behavior of the households, determinants of investment from remittances, and determinants of substantial amount of investment from remittances in different sectors in the following sub-sections.

### Expenditure and Investment Behavior of the Households

The amount of consumption and expenditure by various heads of household helps to assess the socioeconomic condition of the household. Therefore, it is necessary to study the consumption and expenditure patterns along with the income patterns in order to determine the investment behavior of the households. Accordingly, data was collected about the regular consumption of major food and non-food items, as well as expenditures on durables and different kinds of investments made by the study households.

This study considers six types of expenditure and investment at the household level. These are: (a) consumption of major food and non-food items; (b) expenditure on durables; (c) expenditure on physical investment; (d) expenditure on financial investment; (e) expenditure on human resources development (HRD) investment; and (f) expenditure on social investment of the study households.

Purchasing of land, house purchasing/construction/repair, purchasing of agricultural and non-agricultural instruments, loan repayment and investments on industry constitute the physical investment category. Financial investments include expenditures on stock market, fixed deposits, insurance, mutual funds, savings, bonds and the like. Investments in human resource development (HRD) include expenditures on education, health care, training and entertainment

of the household members. Social investment is used to form social capital. Social capital is the glue that cements the social bonding and investments on the development of social infrastructure, social safety, gifts and helping others were considered as social investments.

The average amount consumed per household was computed by dividing the total quantity consumed by the number of households that consumed the particular items. Similarly, the average amount purchased was computed by dividing the total quantity purchased by the number of households that purchased the particular items. The average expenditure per household was computed as: *Average Expenditure = Total Expenditure / Number of consuming HHs or the number of total households, where Total Expenditure = Σ(quantity consumed × local market price)*. The interview questionnaire was so designed to extract the information of expenditures on various headings and sub-headings separately. An additional column named "amount of remittances" describes how much the remittances contributed to these consumption and investment expenditures.

Table 1 demonstrates the annual expenditure pattern of the international migrant-sending households. The annual expenditure on current consumption (food and daily necessities) is estimated at BDT 254,489 (approximately USD 3,181) per household and very naturally all the households have these kinds of expenditures.

**Table 1**: Expenditure pattern of the migrant households and contribution of remittance

| Expenditure types | % of consumer HHs | Average expenditure (in BDT) | Contribution of remittance (% of remittance in total expenditure) | Average amount of remittance (in BDT) |
|---|---|---|---|---|
| Food and daily necessities | 100.0 | 254,489 ±200,019 | 69.4 | 176,616 ±120,654 |
| Durable goods | 59.7 | 29,366 ±38,887 | 75.7 | 22,218 ±30,983 |
| Physical investment | 64.0 | 211,524 ±389,578 | 65.4 | 138,398 ±269,549 |
| Financial investment | 55.3 | 168,431 ±366,308 | 63.0 | 106,074 ±168,039 |
| HRD | 98.8 | 55,432 ±52,573 | 74.3 | 41,195 ±47,045 |
| Social investment | 95.2 | 13,304 ±22,787 | 73.7 | 9,805 ±20,761 |
| **Total** | **N=508** | **567,951 ±545,477** | **68.2** | **387,135 ±337,113** |

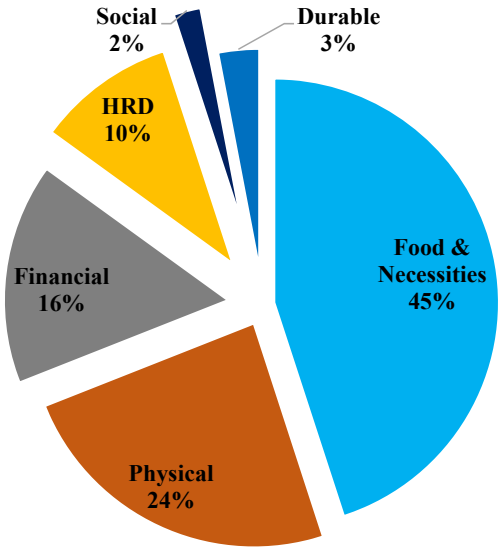
**Source:** Field Survey 2014

It is found that about three-fifths of the households have expenditure on durable goods with an average amount of BDT 29,366 (approximately USD 367) per year. The findings indicate that about 64% of households have physical investments in terms of purchasing land, house construction/purchase/repair, purchasing agricultural equipment and investment for migration. The average amount of investment in this sector is estimated at BDT 211,524 (approximately USD 2,644). More than half of the households were found to have financial investments in terms of shares, bonds, deposit pension scheme (DPS), fixed deposit receipt (FDR) etc., and the average amount of investment in this sector is estimated at BDT 168,431 (approximately USD 2,105). Very logically, nearly all of the households have some sort of investment in human resource development in terms of education, health care, skill development etc., and the investment amount in this sector is estimated at BDT 55,432 (approximately USD 693) per year. Interestingly, the average amount of social investment is

estimated at BDT 13,304 (approximately USD 166) and 95% households were found to have such kinds of investments.

The study also examined the percentage of expenditure/investment on different sectors for migrant-sending households. Very naturally, the percentage of expenditure on current consumption (for food and daily necessities) tops the list, followed by the expenditure on physical investment (Figure 1). Among the total expenditure, about 45% were found to be spent for current consumption, about 24% for physical investment, 16% for financial investment and 10% for human resources development investment. It should be noted that only about 3% of the total expenditure was found to be spent on purchasing durable goods. The lowest percentage of expenditure was contributed to social investment.

**Figure 1:** Sector-wise percentage of total expenditures (including remittances)




**Source:** Field Survey 2014

## Determinants of Investment of Remittance Using Multiple Classical Regression Models

As mentioned earlier, multiple classical regression models have been applied to identify the determinants of investment from remittances in an absolute sense. Through univariate and descriptive analysis, the models consider the covariates — total household income, sex of the household head, ownership of house, asset score, total operative land, education of the household head, age of the household head, household size, economic dependency ratio and dependency ratio of the household. The rationale of selecting the covariates (the independent variables) for the model lies in three grounds of theories, previous studies.

To study the impact of several covariates on total investment, a logarithm form of model specification has been selected to make a linear relationship between the dependent variable (amount of total investment from remittances in a particular sector) and the independent variables. Table 2 shows the estimated regression coefficients along with the significance level and goodness of fit statistic of multiple classical regression models for aggregate investment, physical investment, financial investment, HRD investment and social investment from

remittances. The values of F-statistic along with their significance level and the reasonably high values of $R^2$ indicate that all of the five models (aggregate, physical, financial, HRD and social investment) satisfy the goodness of fit criteria. The results of these five models are discussed below:

**Table 2**: Estimated regression coefficients of multiple classical regression models for identifying the determinants of various kinds of investments from remittances at household level

| Explanatory variables | Aggregate investment | Physical investment | Financial investment | HRD investment | Social investment |
|---|---|---|---|---|---|
| Age of the household head | -0.004 | -0.004 | -0.009 | 0.004 | 0.008* |
| | (0.003) | (0.005) | (0.007) | (0.003) | (0.004) |
| Sex of the household head | 0.125 | 0.331* | 0.462** | -0.081 | -0.124 |
| (Male=1) | (0.101) | (0.192) | (0.230) | (0.110) | (0.144) |
| Education level of the | -0.014 | -0.035* | -0.058*** | 0.029*** | 0.041*** |
| household head | (0.009) | (0.018) | (0.021) | (0.010) | (0.013) |
| Household ownership | 0.615*** | 0.864*** | 0.737** | -0.295* | -0.063 |
| (Own house=1) | (0.141) | (0.315) | (0.364) | (0.152) | (0.205) |
| Household size | -0.085*** | -0.086*** | -0.056 | 0.020 | -0.021 |
| | (0.015) | (0.026) | (0.038) | (0.016) | (0.021) |
| Total operative land of the | 0.00036** | 0.00014 | 0.0011*** | 0.00013 | 0.000257 |
| households | (0.00018) | (0.0003) | (0.0004) | (0.0002) | (0.000252) |
| Logarithm of total | 1.532*** | 1.295*** | 1.303*** | 0.557*** | 1.068*** |
| Household income | (0.082) | (0.160) | (0.190) | (0.092) | (0.120) |
| Asset scores | -0.003* | -0.004 | 0.002 | 0.003* | 0.009*** |
| | (0.002) | (0.003) | (0.003) | (0.002) | (0.002) |
| Economic dependency ratio | 0.077*** | -0.090* | -0.012 | 0.139*** | 0.025 |
| | (0.025) | (0.048) | (0.058) | (0.028) | (0.037) |
| Dependency ratio | -0.025 | -0.259* | -0.156 | -0.189** | 0.024 |
| | (0.084) | (0.144) | (0.166) | (0.090) | (0.121) |
| Constant | -8.258*** | -5.241*** | -6.322*** | 2.334*** | -6.501 |
| | (1.038) | (2.063) | (2.441) | (1.157) | (1.517) |
| n | 508 | 508 | 508 | 508 | 508 |
| $R^2$ | 0.513 | 0.292 | 0.342 | 0.280 | 0.415 |
| Adjusted $R^2$ | 0.502 | 0.264 | 0.311 | 0.263 | 0.399 |
| F Statistic | 48.457*** | 10.588*** | 10.832*** | 16.415*** | 25.861*** |

*Note: ***ρ<0.01 **ρ<0.05 and *ρ<0.10, Figures in the parenthesis indicate the standard error*
Source: Field Survey 2014

## Aggregate investment from remittances

The findings from the fitted regression model for the aggregate investment from remittances indicate that ownership of house, household size, total operative land, total household income, asset score and economic dependency ratio have significant impact on the investment from remittances at the household level. The regression coefficients of household income, ownership of house, total operative land and economic dependency ratio were found to be positive, which indicates that these variables have a significantly positive impact on the investment from remittances at the household level. On the other hand, asset score and household size were found to have negative impacts on the investments from remittances at the household level. The findings indicate that the aggregate household investment from remittances increases by 1.53% for a 1% increase of the total household income. It is understandable as increased income enables the households to release more funds for investment. The households living in their own house have a significantly higher likelihood of investment from remittances than the households living in rented houses because owners do not pay rent, which might directly benefit the investment. The very small regression coefficient of total operative land indicates that it had a minimum impact on aggregate household investment from remittances. The

aggregate household investment from remittances was found to decrease by 0.09% for the one unit increase of the household size. On the other hand, the aggregate household investment from remittances was found to increase by 0.08% for the one unit increase of the economic dependency ratio of the household.

The above discussion suggests that total household income, ownership of house, asset score, total operative land, household size and economic dependency ratio are the significant determinants for the investment from remittances at the household level.

### Physical investment from remittances

The findings from the model for the physical investment from remittances indicate that sex of the household head, ownership of house, education level of the household head, household size, total household income, economic dependency ratio and dependency ratio have significant impacts on the physical investment from remittances at the household level. The physical investment from remittances was found to increase by 1.30% with a 1% increase in the total household income. The widely recognized relationship of income and consumption held in this case also as increased income facilitates more physical investment from remittance. The findings indicate that male-headed households have a significantly higher likelihood of physical investment from remittances when compared to female-headed households. The households living in their own houses have a significantly higher likelihood of investment from remittances than that of the households living in rented homes. The physical investment from remittances was found to decrease by 0.04%, 0.09%, 0.09% and 0.26% for a one unit increase in education level of the household head, household size, economic dependency ratio and dependency ratio of the household respectively. The inverse relationship between education level of the household head and physical investment from remittances might be due to the fact that highly educated household heads generally utilize their resources to the development of their family and social bonding rather than physical investment.

### Financial investment from remittances

The findings from the model for the financial investment from remittances indicate that sex of the household head, ownership of house, total operative land, education level of the household head and total household income have significant impacts on the financial investment from remittances at the household level. The financial investment from remittances was found to increase by 1.30% with a 1% increase in the total household income. Male-headed households have a significantly higher likelihood of financial investment from remittances than female-headed households. Men may be more prone to take risks and want to find wider opportunities than their female counterparts in the conservative social structure of Bangladesh, which could be why male-headed households have significantly higher likelihood of financial investment from remittances. The households living in their own houses have a significantly higher likelihood of investment from remittances than that of the households living in rented homes. The financial investment from remittances was found to decrease by 0.06% with a one unit increase in the education level of the household head.

### Human resources development (HRD) investment from remittances

The findings from the model for the HRD investment from remittances indicate that education level of the household head, ownership of house, asset score, total household income, economic dependency ratio and dependency ratio have significant impacts on the HRD investment from remittances at the household level. The HRD investment from remittances was found to

increase by 0.56% with a 1% increase in the total household income. Households living in rented houses have a significantly higher likelihood of investment from remittances in comparison to the households living in their own houses. The HRD investment from remittances was found to increase by 0.003%, 0.029%, and 0.139% with a one unit increase in the asset score, education level of the household head and economic dependency ratio of the household. On the other hand, the HRD investment from remittances was found to decrease by 0.189% with a one unit increase in the dependency ratio of the household head.

### Social investment from remittances

The findings from the model for the social investment from remittances indicate that age of the household head, education level of the household head, total household income and asset score have significant impacts on the social investment from remittances at the household level. The social investment from remittances was found to increase by 1.07% with a 1% increase of the total household income. The social investment from remittances was found to increase with the increase of the household asset score. The social investment from remittances was found to increase by 0.009%, 0.041%, and 0.008% with a one unit increase of the asset score, education level of the household head and age of the household head of the households.

### Determinants of Substantial Amounts of Investment of Remittances in Different Sectors Using Multiple Logistic Regression Models

The determinants of investment from remittances in different sectors are identified by applying multiple logistic regression models in a substantial and a relative sense. The dependent variable is created by dividing the households into two categories based on the percentage of investment spent by the households. In order to identify determinants of investment of remittances, the analysis has been carried out considering the migrant households only. The models consider the covariates — total household income, sex of the household head, ownership of house, asset score, total operative land, education of the household head, age of the household head, household size, economic dependency ratio and dependency ratio of the household. Table 3 shows the relative risk with significance level for different covariates obtained from multiple logistic regression models for the likelihood of more investment of remittances at household level in different sectors: physical, financial, HRD and social. All of the four multiple logistic regression models were found to fit significantly on the basis of all available tests including the Hosmer-Lemeshow test.

### Physical investment from remittances

The findings indicate that household income, sex of the household head, ownership of living house, asset score, education of the household head, household size and age of the household head have significant impacts on the likelihood of more investment in the physical sector at the household level. It should be noted here that the finding of the household income as covariates has shown consistent results in terms of physical investment. The likelihood of more and substantial investment in the physical sector at the household level was found to increase significantly with the increase in household income.

**Table 3**: Estimated relative risks from logistic regression models for identifying the predictors of more investment from remittances in physical, financial, HRD and social sectors at household level

| Covariates | Relative risks with significance level for the model of | | | |
|---|---|---|---|---|
| | Physical investment | Financial investment | HRD investment | Social investment |
| **Income of the households** | | | | |
| BDT 0-200,000 (reference) | **1.000** | **1.000** | **1.000** | **1.000** |
| BDT 200,001-350,000 | 2.304** | 1.634 | 0.573 | 0.897 |
| BDT 350,001-600,000 | 3.490*** | 2.160 | 0.347*** | 0.823 |
| BDT 600,001 and above | 7.142*** | 3.694*** | 0.116*** | 0.877 |
| **Sex of the household head** | | | | |
| Female (reference) | **1.000** | **1.000** | **1.000** | **1.000** |
| Male | 1.909** | 1.225 | 0.687 | 0.444*** |
| **Ownership of the house** | | | | |
| Own house (reference) | **1.000** | **1.000** | **1.000** | **1.000** |
| Rented house | 0.332** | 0.354** | 7.640*** | 2.443** |
| Others | 1.917 | 0.823 | 1.658 | 1.782 |
| **Asset scores of the households** | | | | |
| Poor (scores, ≤45) (reference) | **1.000** | **1.000** | **1.000** | **1.000** |
| Countable (scores, 46-70) | 0.793 | 0.923 | 1.970** | 1.726 |
| Moderate (scores, 71-95) | 0.584* | 1.050 | 2.246** | 2.628** |
| Rich (scores, 96+) | 0.466** | 1.862* | 1.637 | 1.503 |
| **Total operative land** | | | | |
| Functionally landless (reference) | **1.000** | **1.000** | **1.000** | **1.000** |
| 51-150 decimal | 1.006 | 1.317 | 0.712 | 1.038 |
| 151 & above decimal | 1.099 | 1.300 | 0.745 | 1.064 |
| **Education of the household head** | | | | |
| Illiterate (reference) | **1.000** | **1.000** | **1.000** | **1.000** |
| 4-5 years of schooling | 1.669* | 1.035 | 0.836 | 0.959 |
| 6-10 years of schooling | 1.335 | 0.432*** | 1.254 | 1.366 |
| HSC & above | 0.537* | 0.440** | 2.297** | 2.977*** |
| **Family size** | 0.929* | 0.896*** | 1.088** | 1.019 |
| **Age of HH** | 0.980*** | 0.992 | 1.015** | 1.024*** |
| **Economic dependency ratio** | 0.898 | 1.072 | 1.265*** | 1.014 |
| **Dependency ratio** | 0.909 | 0.898 | 0.964 | 0.982 |
| **Constant** | 0.798 | 0.541 | 0.163*** | 0.058*** |
| n | 508 | 508 | 508 | 508 |
| -2 logL | 624 | 581 | 564 | 488 |
| $\chi 2$ | 56.77 | 46.44 | 90.24 | 42.44 |
| Cox & Snell $R^2$ | 0.106 | 0.087 | 0.163 | 0.080 |
| Nagelkerke $R^2$ | 0.143 | 0.123 | 0.225 | 0.124 |
| Hosmer and Lemeshow $\chi 2$ | 3.953 | 7.698 | 11.213 | 7.972 |
| p-value | 0.86 | 0.46 | 0.19 | 0.44 |

**Source:** Field Survey 2014

The findings indicate that the likelihood of substantial investment in the physical sector at the household level were 2.30, 3.49 and 7.14 times higher for the households with income levels (BDT 200,001-350,000), (BDT 350,001-600,000) and (BDT 600,001and above) respectively in comparison to the households with income levels BDT 200,000 or less. Male-headed households have a 1.91 times higher likelihood of substantial investment in the physical sector than female-headed households. The likelihood of more and substantial investment in the physical sector at the household level was 67% less for households living in rented houses in comparison to households living in their own houses. The findings reveal that asset score provides a counterintuitive result as a predictor of physical investment, which may be a result of this study's design. The asset score of the households were constructed in such a way that the

households with items like agricultural and non-agricultural instruments were assigned with higher scores, which belong, to some extent, to the physical sector investment, too. As a result, these households are expected to invest less, rather than substantially, in the physical sector. The likelihood of more and substantial investment in the physical sector at the household level was found to be 42% less for households with moderate asset scores and 54% less for household with rich asset scores, in comparison to households with poor asset scores. The findings indicate that the total operative land of the households had no significant impact on physical investment. Educational level of the household heads was found to have mixed impact on the investment in the physical sector.

The findings also reveal that the likelihood of more and substantial investment in the physical sector at the household level was 1.67 times higher for households having household heads with four to five years of schooling in comparison to households whose heads had no education. On the contrary, the households having household heads with HSC or higher levels of education were found to be 46% less likely to invest in physical sectors than the households whose household heads were illiterate. This may be due to the fact that educated household heads prefer to invest more in HRD sectors than other sectors for intergenerational and inter-temporal benefits. The findings indicate that family size and age of the household head had significantly negative impacts on the likelihood of more and substantial investment from remittances in physical sectors. The odds of investing in the physical sector were found to be 0.929 and 0.98 times lower with a one unit increase in family size and age of the household heads respectively.

### Financial investment from remittances

The findings indicate that household income, ownership of house, asset score, education of the household head and household size have significant impacts on the likelihood of more investment in the financial sector at the household level. Chances of more and substantial investment in the financial sector at the household level were found to increase with the increase of household income. It is found out that the likelihood of substantial investment in the financial sector at the household level was 3.69 times higher for households with income levels BDT 600,001 and above in comparison to households with income levels BDT 200,000 or less. The findings indicate that the likelihood of more and substantial investment in the financial sector at the household level was 65% less for households living in rental homes in comparison to the households living in their own houses. The likelihood of more and substantial investment in the financial sector at the household level was found to increase with an increase in asset scores. This investment was found to be 1.86 times higher for households with rich asset scores (≥96) in comparison to households with poor asset scores (≤45). The findings indicate that the educational level of the household-head has a negative impact on investment in the financial sector. The likelihood of more and substantial investment in the financial sector at household level was found 57% and 56% less for the households with household heads reporting six to 10 years of schooling and HSC & above respectively in comparison to households with no education of the household heads. Like physical investment, family size had a significantly negative impact on investment in the financial sectors. The odds of investing in the financial sector were found to be 0.896 times lower with a one unit increase in family size.

### Human resources development (HRD) investment from remittances

The findings indicate that household income, ownership of living house, asset score, education of the household head, household size, age of the household head and economic dependency ratio have significant impacts on the likelihood of more investment in the human resources development (HRD) sector at the household level. The likelihood of more and substantial

investment in the HRD sector at the household level was found to decrease significantly with an increase in household income. The findings indicate that the likelihood of substantial investment in the HRD sector at the household level were 66% and 88% less for the households with income levels (BDT 350,001-600,000) and (BDT 600,001 and above) respectively when compared to households with income levels BDT 200,000 or less. More and substantial investment in the HRD sector at the household level was 7.64 times higher for the households living in rental houses in comparison to the households living in their own houses. This type of investment also increases significantly with an increase in the asset scores of the households. The likelihood of substantial investment in the HRD sector at the household level was 1.97 and 2.25 times greater for households with countable and moderate asset scores respectively than the households with poor asset scores. The study indicates that the likelihood of more and substantial investment in the HRD sector at the household level was 2.30 times higher for the households having HSC & above level of education for household heads than the households with illiterate household heads. The findings indicate that the economic dependency ratio of the households have a significantly positive impact on the HRD investment at the household level. The odds of investing in the HRD sector were found 1.09, 1.02 and 1.27 times higher with a one unit increase in family size, age of the household head and economic dependency ratio respectively.

### Social investment from remittances

The findings indicate that gender of the household head, ownership of living house, asset score, education of the household head and age of the household head have significant impacts on the likelihood of more investment in the social sector at the household level. The findings indicate that male-headed households are 0.56% less likely to make a substantial investment in the social sector than female-headed households. Likewise, the findings indicate that the likelihood of more and substantial investment in the social sector at the household level was 2.44 times higher for households living in rented houses in comparison to households living in their own houses. The likelihood of more and substantial investment in the social sector at the household level was 2.628 times higher for households with moderate asset scores in comparison to the households with poor asset scores. The findings indicate that the education of the household head has a significantly positive impact on the social investment at household level. Households with heads having HSC or higher level of education were found to be 2.98 times more likely to invest in social sectors than households with illiterate household heads. The odds of investing in the social sector were 1.02 times higher with a one unit increase in the age of the household head.

## Conclusions

This study found that more than two-thirds of household expenditures are made using remittances. Total household income, ownership of house, asset score, total operative land, household size and economic dependency ratio are significant determinants for the investment from remittances at the household level. The aggregate household investment from foreign remittances was found to increase by 1.53% with a 1% increase in the total household income. The identification of sector-wise determinants indicates that a few determinants are common for all of the sectors. Total household income, ownership of house and education level of the household head can be shown as the common determinants for physical, financial and HRD investment sectors. The study indicates that both the physical and financial investment from remittances increase by almost 1.30% with a 1% increase in total household income. Ensuring

education facilities for household members was one of the main investment sectors of human resource development. Foreign remittances increased the purchasing capacity of the receiving end, which in turn facilitates education for the left-behind household members. Analysis of the determinants of substantial amount of investment of remittances in different sectors discovered that several factors determined the likelihood of more investment in different sectors at the household level. Among them, household income, ownership of house, asset score, education of the household head, and household size are notable. The government should play a pioneering role to inform the non-residential Bangladeshi from the Sylhet region regarding the potential investment sectors explored by the different studies. To channel more remittances into investment, the government and other stakeholders need to make and implement policies offering different incentives and logistic supports to ensure a sound investment climate for the higher income group of remittance-receiving households.

## References


Adams, H. A., Jr. & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries? *World Development,* 33(10), 1645-1669. https://doi.org/10.1787/9789264013896-17-en

Adams, R. H. & Cuecuecha, A. (2010). Remittances, household expenditure and investment in Guatemala. *World Development*, 38(11), 1626-1641. https://doi.org/10.1016/j.worlddev.2010.03.003

Baldé, Y. (2010). The impact of remittances and foreign aid on savings/investment in Sub-Saharan Africa (SSA). (Unpublished doctoral dissertation). Université de Limoges, France.

Bangladesh Bureau of Statistics (2011). *Household income and expenditure survey: 2010*. Dhaka, Bangladesh: Bangladesh Bureau of Statistics, Ministry of Planning, GoB. Retrieved from http://catalog.ihsn.org/index.php/catalog/2257

de Bruyn, T. & Kuddus, U. (2005). *Dynamics of remittance utilization in Bangladesh* (IOM Migration Working Paper Series No. 18). Retrieved from http://publications.iom.int/system/files/pdf/mrs_18.pdf

Drinkwater, S., Levine, P. & Lotti, E. (2002, December). The Economic Impact of Migration: A Survey. Presentation at the second workshop of the Fifth Framework Programme Project of European Enlargement: the impact of East-West Migration on Growth and Employment, Vienna, Austria.

Fayissa, B. & Nsiah, C. (2010). The impact of remittances on economic growth and development in Africa. *The American Economist*, 55(2), 92-103. https://doi.org/10.1177/056943451005500210

Glytsos, P. N. (1993). Measuring the income effect on migrant remittances: A methodological approach applied to Greece. *Economic Development Cultural Change,* 42(1), 131-168. https://doi.org/10.1086/452068

Hossain M. Z., (2015). *International migration and household investment behavior of remittances in Sylhet region of Bangladesh*. Dhaka, Bangladesh: University Grants Commission of Bangladesh.

Hossain M. Z., Kazal M. H. & Ahmed J. U. (2014). *Rural-urban migration and its implications for food security in Bangladesh*. Dhaka, Bangladesh: The University Press Limited.

Hossain, M. Z., Kazal, M. M. H. & Faisal, F. E. (2010). *Lack of utilization of local funds and investment climate in Sylhet region: Perception analysis*, (ERG Working Paper Investment Climate Series No: 2/2010). Retrieved from http://www.ergonline.org/ifc/document/ERG%20WP%202-%202010_final.pdf

International Organization of Migration (2010). *Migration remittances and assets in Bangladesh: Considerations about their intersection and development policy recommendations*. Dhaka, Bangladesh: International Organization for Migration (IOM). Retrieved from http://archive.thedialogue.org/PublicationFiles/Migration%20Remittances%20and%20Assets_Bangladesh_final%20appendix.pdf

Mahmud, W. & Osmani, S. R. (1980). *Manpower export from Bangladesh to the Middle East: A cost-benefit analysis*. Dhaka, Bangladesh: Bangladesh Development Studies.

Moniruzzaman, M. (2009). *The economics of migrants' remittances in Bangladesh*. Dhaka, Bangladesh: Muktachinta Prokashona.

Murshid, K. A. S., Iqbal, K. & Ahmed, M. (2002). *A study on remittance inflows and utilization*. Dhaka, Bangladesh: International Organization of Migration. Retrieved from http://www.un-

bd.org/Docs/Publication/IOM--A%20Study%20on%20Remittance%20Inflows%20and%20Utilization.Pdf

Newland, K. & Patrick, E. (2004). *Beyond remittances: The role of diaspora in poverty reduction in their countries of origin*. Washington, DC: Migration Policy Institute. Retrieved from: http://www.migrationpolicy.org/research/beyond-remittances-role-diaspora-poverty-reduction-their-countries-origin

Quibria, M. G. (1986). Migrant workers and remittances: Issues for Asian developing countries. *Asian Development Review*, 4(1), 78-99.

Russel, S. (1986). Remittance from international migration: A review in perspective. *World Development*, 14(6), 677-696.

Siddiqui, T. & Abrar, C. R. (2003). *Migrant worker remittances and micro-finance in Bangladesh*. Geneva: International Labour Organization. Retrieved from http://ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_117970.pdf

Swamy, G. (1981). *International migrant workers' remittances: Issues and prospects* (World Bank Staff Working Paper No. 481). Washington, DC: World Bank.

Uddin, J. (2011). Impacts of foreign remittances on expenditure, socio-psychic cost and woman empowerment in rural Bangladesh. (Unpublished doctoral dissertation). Department of Economics, Jahangirnagar University in Bangladesh.

World Bank (2014). *Migration and remittances: Recent developments and outlook*. Washington, DC: World Bank. Retrieved from http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationandDevelopmentBrief23.pdf