

INTERNATIONAL MIGRATION AND DEVELOPMENT:
EVIDENCE FROM RURAL HOUSEHOLDS IN BANGLADESH

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Abstract

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Aid communities and the governments of developing countries are paying increased attention to international migration as a key driver of economic development. Evidence, however, suggests that the poor cannot readily take part in international migration due to the high placement cost. Previous studies also provide mixed results regarding the positive contribution of international migration to the physical and human capital investment of origin households. This thesis uses unique data on rural households for the period 2000–2014 to examine the characteristics and outcomes of international migration from Bangladesh.

The first analytical chapter (Chapter 4) explores the question of whether and how the socio-economic characteristics of the beneficiary households of international migration have changed over time. The analysis shows that education level of household members and household assets are important and positive determinants of international migration, particularly in early years of migration. It also reveals that, in recent times, less educated and less wealthy households are beginning to take part in migration, albeit slowly. In addition, social network facilitating migration within

community is a key contributor to migration, but its predictive power declines as the migration period grows long. These findings suggest that entry barriers to international migration, resulting from paucity of financial, human and social capital endowment, have decreased in recent years. Contrary to the findings in exiting literature, migration network plays limited role in rendering the change in the composition of beneficiary households of international migration. Further analysis suggests that possible causes for the change include persistent demand for low-skilled workers in major destination countries, growing domestic labour demand favouring educated workers, and improved access to non-collateral loans and grants to finance migration.

The second set of analyses (Chapter 5) evaluates the outcome of migration on household investment and consumption by classifying migrant households into three distinct groups in varied stages of migration (new, continued and post). The results show that initiating migration reduces household investment in business, while terminating migration is associated with substantial increase in business investment. It is also found that migration contributes significantly to augmenting healthcare expenditures, and helps improve the school enrolment ratio of children, especially girls, in households with relatively new experience of migration. The outcome of migration in household investment and consumption are distinct between groups and even of opposite directions in some cases. These heterogeneous effects often cancel each other out and, consequently, no or insignificant average effects of migration are observed when only the average effect on all migrant households is estimated. This finding suggests a need for reconsideration of the findings in many previous studies in which no heterogeneous effect of migration is taken into account.

Dedication

To my parents, Keiko and Tomohiko Kikkawa,
and to my family, Narufumi, Yu and Mai

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CHAPTER 1

Introduction

1.1 Introduction

As of 2015, there were 244 million international migrants living outside their home countries, and workers' remittances to their families totalled US\$ 601 billion (United Nations, 2016; World Bank 2016). Of that total, US\$ 441 billion went to developing countries. International migration is now an important livelihood option for many households in developing countries. Aid communities and the governments of developing countries are paying increased attention to international migration as a key driver of development.

There is a wealth of empirical literature documenting the ways in which migration can affect the households in origin countries. Migration, as a livelihood option, offers access to lucrative jobs, diversifies income sources, and reduces covariate risk (Amuedo-Dorantes and Pozo, 2006; Gubert, 2002; Matsumoto et. al., 2006; Rosenzweig and Stark, 1989; Yang and Choi, 2007). International migration contributes to the reduction of poverty ratio in many migrant source countries (Adams 2006; Estudillo et al., 2006; Pernia, 2008).

Reflecting the positive contribution of migration to development, the Sustainable Development Goals (SDG) adopted at the United Nations (UN) in 2015 include the goal of facilitating migration and remittances, in the hope that a greater number of poor households will avail themselves of the benefits of migration. SDG goal 10 on reducing inequality within and among countries includes two relevant goals on migration: 1) facilitating orderly, safe, regular and responsible migration and mobility

of people, through means including the implementation of planned and well-managed migration policies; and 2) by 2030, reducing to less than 3 per cent the transaction costs of migrant remittances and eliminating remittance corridors with costs higher than 5 per cent.

There are, however, at least two important questions on migration and development to which empirical literature does not provide sufficient response. One is the question on the beneficiaries of international migration. While there are high expectations that international migration can substantially reduce poverty, theory and evidence suggest that international migration is largely a middle-class phenomenon, often inaccessible to the poor (de Haas, 2010a; Massey, 1990). The high cost of international migration constitutes an entry barrier. In Asia, the initial cost of migration for overseas employment among low-skilled workers typically equals to about the annual salary of oversea jobs or more (Abella and Martin, 2015).

In addition to household lack of financial resources to pay for migration, poor quality of human capital and lack of social network to facilitate migration constitute other barriers to migration (de Haas, 2010b; McKenzie and Rapoport, 2010; Portes, 1979). However, only a limited number of studies have made inquiry into the beneficiary households of international migration and the characteristic associated with them, or examined whether and/or how the poor can access this livelihood option. To the best of my knowledge, there is no relevant quantitative and longitudinal analysis of cases other than Mexico-US migration.

The second question is on the outcomes of migration on household investment practices; it is important to understand whether or not remittances are being invested in human and physical capital and are contributing to creating sustainable income

generating capital among origin households (Ang et al., 2009). The empirical evidence, however, presents highly mixed outcomes. Some studies find that migration and remittances having positive impact on investment in small business start-ups, agricultural equipment, land improving technology and adoption of high yield rice varieties (Böhme, 2015; Mendola, 2008; Yang, 2008). Similarly, migration and remittances are found increasing education expenditures and improving school enrollment and attainment (Acosta, 2011; Mansuri, 2006; Edwards and Ureta, 2003; Yang, 2008). Other studies, however, report no or negative impacts (McKenzie and Rapoport, 2011). Prolonged migration is found to be associated with decline in agricultural productivity (Azam and Gubert, 2006; Rozelle et al., 1999). These mixed results likely stem from differences in the forms of migration in the sites studied as well as differences in the estimation methods used to evaluate impact.

1.2 Objectives

The overall objective of this dissertation is to provide empirical evidence towards a better understanding of the relationship between international migration and economic development by examining the impact of migration on the household in origin country. To this end, the thesis has two specific aims. The first aim is to make an inquiry into the beneficiaries of international migration by identifying characteristics associated with migrant households and to examine whether international migration is becoming an accessible option for households with low wealth and human capital endowments. The second aim of the thesis is to examine the outcome of migration on household investment in physical and human capital. I pay close attention to the heterogeneity in

the forms of migration by classifying migrant households into three distinct groups (new, continuing and post migration households), and evaluate the outcome of migration specific to each group. I use a unique data set of rural households in Bangladesh for my analysis.

The thesis contributes to the existing literature in the following ways. First, the study complements the growing body of literature evaluating the impact of migration on households in developing countries by identifying the beneficiaries of international migration, their associated characteristics and the change in the constituents of beneficiaries over time. Understanding who migrates are as important as evaluating how migration affects the households of origin, but the literature in this field remains scarce. The significance of this study lies in its use of longitudinal data containing information on migration route and region seldom studied for these purposes. Examination of similarities and differences in characteristics of migrants across countries and regions is expected to verify and refine the model currently used to explain the mechanism of selection of international migrant households.

Second, this thesis contributes to the on-going debates on the impact of migration on household investment, to which the empirical evidence provides mixed results. This thesis conducts nationally representative and up-to-date evaluation on the outcome of international migration among rural households in Bangladesh. It proposes an innovative approach to examining into the outcome of international migration among migrant households in varied stages of migration. The approach is expected to provide evidence to answering a fundamental research question -- whether migration brings long-lasting impact on household by increasing capital (Ang et al., 2008).

Finally, it is hoped that the empirical evidence of the thesis will contribute to the policy making process in Bangladesh and other migrant origin countries which are keen to leverage international migration for economic development.

1.3 Organization of the dissertation

The dissertation is organized as follows. In the rest of this introductory chapter, an overview of the international migration in Bangladesh and relevant policy information are provided as background. Chapter 2 reviews the literatures on migration and development. It assesses existing studies on four themes of relevance to the thesis; 1) the determinants of migration; 2) the beneficiaries of international migration; 3) impact of migration on household capital investment; and 4) methodological issues in assessing the determinants and the impact of migration using origin household samples. In Chapter 3, I provide detailed information on the data set used in my analysis and examine the pattern of attrition in the samples. Chapter 4 titled, “The Changing Landscape of International Migration: Evidence from Rural Households in Bangladesh, 2000-2014,” presents the findings of the analysis of beneficiary households of international migration. Chapter 5, titled “An Inquiry into the Heterogeneous Outcomes of International Migration: Evidence from Rural Households in Bangladesh,” examines the outcome of international migration on investments specific to each group of households in differing stages of migration. Chapter 6 closes the thesis with conclusions and policy recommendations.

1.4 International migration and Bangladesh

Bangladesh is the source country of seven million international migrants and the fifth largest source of emigrants after India, Mexico, Russia and China (UN, 2016). In 2015, Bangladeshi migrants remitted home a total of US\$ 15.31 billion, an amount equivalent to 13 percent of the country's GDP (World Bank, 2016). The majority of Bangladeshi migrants are employed in the Middle East and Southeast Asia, performing low-skill jobs. The pattern of migration from Bangladesh to these destination countries is largely temporary and circular because immigration policies of the destinations do not provide permanent residency for most foreign migrants. Figure 1.1 presents the number of annual departures of overseas workers from Bangladesh for the period 1976-2015 (BMET, 2016). It can be seen that overseas employment steadily increased from the mid-1970s to the early 2000s and peaked in 2008, with more than 800,000 workers newly deployed abroad. This surge in departures can be attributed to the construction boom in the Middle East resulting from a large hike in the world oil price. In the meantime, due to political turmoil, the Bangladesh economy stagnated during the period 2006-2009. The global financial crisis of 2008 explains the subsequent sharp reduction in newly departing workers. In recent years, the number of annual worker departures fell to 400,000 to 500,000. Migrants were mostly male and only a few thousand female migrants per year left for overseas jobs in the 1990s. In recent times, the proportion is changing; woman migrants constituted 18.7% of total departures in 2015.²

Overseas employment and the remittances sent from workers abroad play an important role in the Bangladesh economy today. The Poverty Reduction Strategy Paper drafted by the government refers to workers remittance as one of the two pillars of the

² 103,718 female Bangladeshi workers departed for overseas jobs in 2015.

economy along with garment industry (IMF, 2013). Raihan et al. (2008) shows that remittances contributed to 1.7 out of the 9 percentage point reduction in poverty headcount ratio in Bangladesh between 2000 and 2005. According to the International Organization for Migration (IOM), which conducted a large survey, covering 10,000 nationally representative households in Bangladesh with migrants overseas, most migrant families reported increased food consumption, enhanced education opportunities, and improved income security through remittances (IOM, 2009). Sharma and Zaman (2013) estimated the impact of international migration among Bangladeshi households using propensity score matching methods based on unique data collected in 2007 among selected villages. They found that international migrant households spend more on consumables and household appliances, and have a higher adoption rate of high yield varieties of rice than households with no international migrants.

While positive impact of international migration on origin households is found, the risk is also present: some migrants find themselves in very vulnerable situations including human trafficking, labour exploitation, and fraud. There have been numerous reports of Bangladeshi workers being cheated by recruiters and exploited by employers (ILO, 2014). According to the survey data I used, as described in Chapter 3, a total of 31 households (1% of the total of 2,864 households in 2014) reported that they had been cheated by recruitment agents in the past with the damage ranging from BDT 6,000 to 900,000 (mean BDT 16,645, or USD 2393)³. To address these problems, the Overseas Employment and Migrants Act was passed in 2013 to “establish a safe and fair system of migration, to ensure the rights and welfare of migrant workers and the members of

³ 1USD=69.65TK based on 2010 official exchange rate from World Development Indicators, and all price mentioned in the thesis are price-adjusted at 2010 level by using CPI from WDI, unless otherwise stated.

their families (The Preamble)”. This is the first law on overseas employment passed by the parliament of Bangladesh.

Migration and development planning in Bangladesh

The government of Bangladesh is active in mainstreaming migration as an important element of the country’s economic development plan. The country’s latest Poverty Reduction Strategy Paper (PRSP) put forward a list of long-term strategies for expanding overseas employment such as: identifying new markets for overseas employment; improving the skills of migrants; undertaking special initiatives for providing migration opportunities to people suffering from seasonal draught/famine and other ecological calamities; and increasing the inflow of remittances and ensuring their proper use (IMF, 2013).

In addition, the country’s seventh five-year plan for fiscal years 2016 to 2020 includes a new section dedicated to discussion of the importance of aligning international migration to the development of Bangladesh. It includes a number of proposals of initiatives for implementation such as tapping diaspora and other migrants’ funds for investments (Government of Bangladesh, 2015). The government acknowledges the importance of promoting investment among migrants as migration from Bangladesh is largely temporary, so that most migrant workers eventually return home.

Increased attention by the Bangladesh government to the role of international migration in fostering the economic development of the country necessitates a thorough assessment of the impact of migration at the household level, since most remittances are channeled to the families of migrant workers. However, only a limited number of

quantitative studies have been carried out to date in order to provide policy-relevant and nationally representative evidence.

CHAPTER 2

Literature Review

A growing number of studies examine the role of migration in social and economic development of the origin countries and welfare improvement of the households. In this chapter, I review selected studies in four areas of relevance to the thesis: i) studies examining the determinants of migration; ii) studies of the beneficiaries of international migration in origin countries; iii) studies examining the relationship between migration and household capital investments; and iv) studies highlighting methodological issues in evaluating the impact of migration on welfare at household level.

2.1 The determinants of migration: household approach

Pioneering empirical work on migration attempted to create a model explaining the determinants of migration. Todaro and Harris (1970) postulated that the decision to migrate is a choice made by an individual based on income differences between the origin and the destination area. They hypothesize that the wage differentials derive from expected income, rather than actual income, and the choice also involves weighting other costs and benefits of migration such as the cost of living, travel distance, and accessible amenities. These empirical studies were primarily conducted in response to massive influx of population into urban centres, deterioration of living conditions in urban settlements, and massive unemployment in developing countries. One of the shortcomings of this approach is that it has little to say about the consequences or the benefits of migration for the origin households and communities.

Stark and Levhari (1982) complement the Todaro model of the determinants of migration by broadening the unit of analysis from individual to household. The New Economics of Labour Migration (NELM) assumes that migration is a household decision based on the household utility maximization model (Stark and Bloom, 1985; Taylor, 1999). According to the NELM approach, migration is determined by the costs and benefits it brings to the home household. Hoddinott (1994) has shown that the household utility maximization model of migration together with the characteristics of migrants and the household explains the internal migration observed in western Kenya. That finding supports the validity of assessment of the impact of remittances using household as the unit of analysis.

Based on the NELM approach, a number of studies document the ways in which migration can influence the wellbeing of the origin households. These studies find that the migration option offers access to lucrative jobs and reduces covariate risk which cannot be mitigated by communal risk pooling methods. Rosenzweig and Stark (1989) provide empirical evidence using the case of marriage migration in India. They found that farmers facing more risks are more likely to send their daughters for marriage in far-away villages. By doing so, the families are able to reduce variance in food consumption at the time of negative shocks because of resource transfer by in-law families. Matsumoto et al. (2006) using evidence from Ethiopia, Kenya, and Uganda find that households cultivating on lower productivity/fertility land are more likely to engage in migration.

2.2 The beneficiaries of international migration

Sociological theories on migration suggest that the likelihood of migration is largely determined by the level of financial, human and social capital of workers and the households (de Haas, 2010a). Financial capital refers to savings and liquid assets which are used to pay for migration costs. Human capital refers to quantity and quality of labour in terms of health, education, skills and ability suitable for jobs abroad. Social capital includes social network or migration network based on mutual trust through which potential migrants and their households obtain information about the availability of jobs abroad.

The empirical literature, although limited in number, proposes at least two hypotheses about the characteristics of households that benefit from international migration. Firstly, international migration seems to be largely a middle-class phenomenon often inaccessible to the poor (de Haas, 2010a; Massey, 1990). Some level of assets is a prerequisite since the initial cost of international migration is high. Van Wey (2005) shows that relatively large household assets such as land and savings are the key characteristics of households with international migrants in the case of Mexico. In addition to financial capital, good quality of human capital is another prerequisite to migration. Migrants tend to be positively selected on the basis of education and skills, even though many migrant worker jobs do not appear to require much education (de Haas, 2010b; Portes, 1979). McKenzie and Rapoport (2010) provide empirical evidence of positive selection of migrants based on education attainment, using data from Mexico. They argue that this favouring of educated workers may be due to the fact that migrant jobs are often offered in short-term contracts; migrants must have

communication, information collection, and decision-making skills to remain being employed.

Secondly, the literature points to evidence that the development of migration network can alter in the constituents of the beneficiaries of international migration over time (de Haas, 2010a). Because employers often find new workers through the network of existing workers, migration network plays a critical role in determining who migrates (and who does not) (Massey, 1990). The development of migration network can assist the poor to take up overseas jobs by reducing various costs of migration (de Haas, 2010a; McKenzie and Rapoport, 2007; Stark et al., 1986). Network can reduce the direct cost of travel as well as the indirect cost of transaction measured in terms of time and effort to collect information on job availability and to access funds to pay for migration. This is a reasonable assumption but thus far no empirical evidence has been presented to validate this claim.

Similarly, development in migration network can lead to reversal of the sign of education-based selection. McKenzie and Rapoport (2010) show that in Mexico the average education level of migrants from communities with established migration networks is lower than that of migrants from areas relatively new to migration. It is argued that network can reduce information asymmetry between origin and destination communities, and/or between migrants and employers, making migrant work less risky and less demanding in terms of education requirements than in the initial phase.

Above findings suggest that international migration can eventually benefit the poor if network develops over time, reducing costs and lowering requirements. Thus far, the literature that empirically tests this claim by examining association between characteristics of households and international migrants has mostly focused on Mexico-

US migration. This is one of the largest migration corridors in the world (UN, 2015), and active research on this migration route has generated rich longitudinal data on migrant communities. However, each migratory route is likely to be built on unique economic and social conditions within diverse institutional frameworks. According to the UN (2015), as much as 43% (104 million) of international migrants originate from Asia compared to those of Latin America and Caribbean (15% or 37million). The pattern of migration differs substantially between Asia and Latin America with regards to the choice of destination countries, duration of migration, availability of settlement options, and wage differentials: the characteristics of migrant households, therefore, may differ substantially among regions. This calls for the need to examine the characteristics of the beneficiary households of international migration in regions other than America and to test the external validity of the existing model, i.e., whether the patterns and models of migration found in Mexico-US are consistent with migration patterns in other parts of the world.

In chapter four of this thesis, I conduct analysis of households which benefit from international migration, using Bangladesh as a case study. I examine how household financial, human and social capital levels are associated with the likelihood of international migration and determine whether the entry barriers to international migration reduced over time.

2.3 The impact of migration on household capital investment

A growing number of studies attempt to determine whether or not remittances are being invested in human and physical capital in origin countries. Regarding human capital, a number of studies find that international migration and remittances contribute positively to human capital development through increasing household education and health expenditures (Acosta, 2011; Calero et al., 2009; Mansuri, 2006; Edwards and Ureta, 2003; Yang, 2008). Calero et al. (2009), for example, show that the receipt of remittances at its mean value contributed to the increase in school enrolment ratio by 2.59 % in Ecuador. They also found that remittances contributed to increasing the quality of education received and prevented households from pulling children out of school at the time of negative income shocks. Meanwhile, other studies provide contrasting evidence that the overall impact of international migration on human capital investment is negative or insignificant (Ang et al., 2008; McKenzie and Rapoport, 2011). For example, Ang et al. (2008) did not find significant impact of remittances on education and health expenditure in the Philippines. Their findings stand in contrast to those of Yang (2008), who finds significant and positive impact of remittances on educational expenditures using data from the same country. Some authors argue that an absence of parental guidance, early termination of schooling due to migration, and reallocation of household work to children left behind may negatively affect the educational performance and enrolment ratio of children in migrant households (Antman, 2011; McKenzie and Rapoport, 2011).

The impact of international migration on physical capital investments such as those in agriculture or business has been studied less than the impact on human capital. Among a small number of studies, the results are mixed. Yang (2008) finds that the

remittances had a positive and significant impact on the level of small business start-up investment in the Philippines. Mendola (2008) finds that international migrant households exhibit higher adoption rate of high yield varieties of rice in Bangladesh. Böhme (2015) shows that migration contributes to increasing investment in agricultural equipment and in land improving technology among households in Mexico. However, other studies find that the loss of prime-age workers to migration and a lack of economic opportunity in origin communities (which triggered migration to start with) make migrant households reluctant to invest in physical capital (Clemens and Orzen, 2015; de Haas, 2011b; Rozelle et al., 1999). Furthermore, Azam and Gubert (2006) show that agrarian migrant households in Mali and Senegal exhibited a higher rate of adoption of agricultural technology, but the actual productivity was lower than that of non-migrant households. It was observed that migrant households tend to hire more contract labour, whose productivity is low due to the problem of moral hazard. Other studies show that remittances can cause Dutch disease in the migrant source communities and reduce the level of economic activities other than outmigration (Ribas, 2008).

A review of the literature suggests that the empirical evidence on the impact of migration on household capital investment presents mixed outcomes. Those mixed results may mask differences in the nature and the forms of migration of the study area and call for more research to obtain a clear understanding. More specifically, there is a need to build evidence using cases of migration across the regions representing different patterns and characteristics of migratory flows.

Those mixed results may also reflect a shortcoming found in the identification strategy of the existing studies; many of them do not take into account of the differences

in the forms of migration *among* samples when estimating the impact of migration on household welfare (Gibson et al, 2013). Migration behaviours are highly heterogeneous with respect to the duration, intensity and stages. The heterogeneity can be more pronounced in regions where predominant flow of migration is temporary and circular than those with permanent migration, because the change in migration status and stages occurs more frequently. However, the estimation model of the existing studies often relies on the use of a binary indicator of migrant or remittance recipient household and identifies an average impact of migration. It is challenging to make accurate assessment of the average treatment effect of migration if the impacts are equally heterogeneous.

It is likely that migrant households face varying conditions influencing the likelihood to invest depending on their migration stage, and these conditions include liquidity and saving level as well as human capital endowment. In chapter five, I test hypothesis predicting heterogeneous investment outcomes among international migration households with varied stages of migration.

2.4 Methodological issues in evaluating impact of migration on household welfare

Migration and remittances can be both the causes and effects of a household's economic decisions on consumption and investment. It is also anticipated that the decision to migrate is linked to particular household characteristics which may not be observed. Therefore, estimation of the determinants of migrant households and evaluating the impact of migration on outcome variables of origin households must control for potential sources of endogeneity in order to establish causality (McKenzie and Yang, 2010). This section reviews the literature on the key methodological challenges specific

to the context of this thesis, which examines the determinants and the consequences of migration using household survey data.

The first issue of methodological concern is to do with selection bias. There may be unobservable household characteristics such as diligence, ability to cope with hardship, risk-loving preference, and unreported household wealth, which may be positively correlated with the decision to migrate abroad. If these unobserved characteristics are simultaneously correlated with the outcome variable, for example, income level, the coefficient estimating the impact of migration on income will be biased. McKenzie et al. (2010), using the example of Pacific migration, show that failure to control for selection into migration results in overestimation of the impact by 27-35 per cent, indicating the presence of positive selection in this migration route.

The issue of selection bias is more complex when heterogeneity in the duration of migration is observed among the samples. Gibson et al. (2013) find that there may be different patterns of migrant selection depending on the time at which migration was initiated. This is a selection problem that is difficult to solve when using cross sectional data with limited information on the migration history of the households.

When estimating the impact of migration on investment, reverse causality and simultaneity may pose another methodological challenge. A typical model assumes that migration status or level of remittances explains level of investment, but it is also possible that the causality runs in the opposite direction. For example, a failure in business may either encourage households to choose migration as an alternative source of income or discourage it by reducing available resources to pay migration costs. However, it is very difficult to know from household survey data alone whether a

particular investment in a household directly affects the decision to migrate. In addition to reverse causality, simultaneity is another concern; there is a possibility that the level of remittances and the investment are jointly determined because remittances may affect the general equilibrium of village economy, which in turn influences the level of investment.

In order to control for various types of endogeneity, the literature uses a number of different methods and techniques depending on the nature of the assessment and the sources of endogeneity (Funkhouser, 2013). Instrumental variables (IV) technique is the commonly employed strategy when household census data is used to estimate the impact of migration (Böhme, 2015; Quismbing and McNiven, 2010; McKenzie and Rapoport, 2010; Mendola, 2008). Endogenous variables (e.g., migrant household dummy or remittances value) are instrumented with variables such as migration history of household, strength of migration network at village level, economic condition of the migrant recipient countries, and distance or travel time to remittance transfer service branch (Calero et al., 2009; McKenzie and Rapport, 2007).

While the use of instruments is popular in the literature, outcome using instruments may still lead to biased estimates if the instruments do not strictly comply with exclusion restriction assumption (McKenzie and Yang, 2010). For example, the use of present migration network value as IV is questionable when evaluating impact on income, because stronger network may allow migrants access to better paying job than migrants with weak or no network. Funkhouser (2013) also notes that the use of some IVs commonly used in migration studies can overly inflate the outcome compared to the OLS estimate, despite the presence of positive selection. Therefore, exogeneity of the

instruments must be carefully examined. Rather than IVs, other studies employ selection correction models to address selection bias (Taylor et al., 2010; Piracha et al., 2012).

Because of the known shortcomings of the instrumental variable methods, the preferred option is to rely on natural experiment. There are two good examples; one uses exogenous economic shock as a source of variation; and the other relies on a visa lottery scheme. Yang (2008) took advantage of the depreciation of some currencies during the Asian Financial Crisis in 1997, which created an exogenous shock to the remittance, albeit in varying degree depending on the destination countries of migrants. He used this variation to estimate the change in the pattern of consumption and investment among migrant households in the Philippines. In the second case, McKenzie et al. (2010) used the data on the outcome of the New Zealand visa lottery program, which randomly assigns migrant status to the selected applicants. They compare the income of the visa awardees in the destination country to those of non-awarded applicants remaining in the origin country. The opportunities for natural experiments, however, are rare and only a limited number of such studies have been conducted to date.

More recently, randomized controlled trial (RCT) is being employed to evaluate the impact of migration (McKenzie and Yang, 2010). RCT is found useful, for example, in evaluating the effectiveness of possible policy interventions. For example, Bryant et al. (2014) conducted an experiment in rural Bangladesh to incentivize famine-prone households to explore domestic migration option. They find that incentivized and migrated households increased intake of food by a large margin, and that the effects were sustained in the following years. A range of experiments are also being conducted

to facilitate financial inclusion and savings of migrants (Ashraf et al., 2015; Doi et al., 2014; Seshan and Yang, 2014).

Last another effective method to minimize selection bias is to use panel data (Lall et al., 2006; Funkhouser, 2013). Panel data analysis can control time-invariant characteristics of households and performs a more rigorous estimation involving changes in outcome variables when migration status or amount of remittances changes over time within a household. However, because of the rigorousness, the estimators of the panel analysis are more likely to be found statistically insignificant, failing to establish any types of relations between the variables. Building panel data requires more cost and effort, and therefore availability is limited compared with cross sectional data. Panel data is increasingly employed in estimation; examples include Böhme (2015), Quismbing and McNiven (2010), and Yang (2008). In this dissertation, I employ panel data set combined with the usage of econometric techniques to address various types of endogeneity in estimating the outcome of migration.

CHAPTER 3

Data Source

3.1 Data

This study utilizes household survey data collected by the Bangladesh Institute of Development Studies (BIDS), the International Rice Research Institute (IRRI) and the Bangladesh Rural Advancement Committee (BRAC). The data is in panel structure and covers 62 of the country's 64 districts.⁴ Figure 3.1 indicates the locations of the sample villages. Five rounds of surveys have been implemented to date, in 1988, 2000, 2004, 2008 and 2014. 1231 households were sampled in 1988, and the number has increased to a total of 2846 households by 2014. The increase in sample size is primarily due to the scaling up of the survey in 2000.⁵

The sample villages and households are selected using multi-stage random sampling based on socio-economic indicators of each district in 1988 (Hossain et al., 2000; Hossain et al., 2009). In the first stage of the sampling, one sub-district was randomly selected for each district in the country (64 sub-districts selected). In the second stage, one village was selected from each sub-district, as best representing the sub-district in terms of population pressure and literacy rate. In the third stage, a census of all households in each selected village was conducted to collect information on land ownership, adoption rate of high yield varieties of rice, and major income sources. Based on the village household data, 20 households per village, representing stratum based on land ownership and land tenure of the village, were selected as the sample

⁴ Two districts (out of total 64) were dropped from the survey because it was logistically difficult to conduct surveys.

⁵ The sample size was increased from 20 households per village to 30 households per village in this year to improve representativeness of the data. New samples were added using method explained in this section.

households. With each survey round, migrated and attrition households were replaced with new households with similar characteristics. The survey also attempts to include new sample households so as to maintain representative samples which are reflective of the land/asset/production characteristics of the district for each survey year. This sampling modality generates unbalanced panel data.

The survey collects information on the socio-economic characteristics of rural households and their members, their agricultural practices and other income generating activities. The survey also collects a wide range of information on village characteristics that capture the geographical features and economic infrastructure of the locality. The data has been employed in a number of empirical studies. Nargis and Hossain (2006) and Hossain et al. (2009) based their investigation of income dynamics and their impact on poverty reduction in Bangladesh on this data. Jaim and Hossain (2011) identify the determinants of women's participation in agriculture using individual level information gathered by the survey. The data was also used by Ahmed and Haque (2011) to perform a comprehensive evaluation of the primary education system, and by Rashid et al. (2014) to evaluate the impact of population pressure on livelihood options in Bangladesh.

The survey gathers detailed information on households' migrant members who are living abroad, including their personal profiles, the purpose and cost of migration, the sources of the funding of the cost, and the amount of remittance sent home. However, the survey does not gather information on the migration history of sample households for the years between surveys. In order to collect that information, an additional questionnaire was introduced in the 2014 survey round (see Annex 1 for the sample questionnaire). In this study, I use data from 2000, 2008, and 2014 surveys

because they contain more information on the village characteristics needed for the analysis. Descriptive data of the sample households is provided in each of the analysis sections (Chapter 4 and 5).

Since the survey only targets households in rural village settings, my analysis represents migration dynamics within rural areas. Due to the rural focus of the survey, this study may have paid less attention to skilled migrants, who mostly reside in urban areas. Nonetheless, the households sampled in the survey are nationally representative of the general population of Bangladesh in 1988, when the majority of the population lived in rural areas (Rahman and Hossain, 1995).

3.2 Understanding the pattern of attrition

The IRRI/BIDS/BRAC survey tracks the sample households over time, but some households fall out of the samples. This attrition is primarily due to migration and death of household members. If the attrition is systematic, the balanced panel samples may no longer represent the population of interest. In this section, I attempt to understand the pattern of sample attrition of for the period 2000-2014, which corresponds to the duration of my analysis. Out of 2492 sample households in 2000, 362 went missing between the periods 2000-2014 (attrition rate of 14.5%). Among those missing households, 145 households disappeared during the period 2000-2008, and 217 during 2008-2014.⁶

I first examine the differences between attrition and non-attrition households by comparing their household and village characteristics in 2000. Table 3.1 shows summary statistics for household and village characteristics of sample households by

⁶ Note: the survey attrition rate during the period 1988 -2000 was 11%.

attrition status. This shows that the two groups are generally comparable. Only a small number of characteristics show statistically significant differences. The households with attrition status were likely to have had somewhat smaller average number of members (0.4 members fewer) and were located in villages with longer travel time to the nearest bank branch and comparatively higher proportion of home-based workers in non-farm sector employment. They were less likely to be found in Khulna Division. Some of the usual factors that are expected to contribute to attrition, such as land size, education level, or migration status, do not appear to explain the incidences of attrition in the samples.

In addition to comparing mean differences, I examined the determinants of attrition using probit analysis. The dependent variable of the analysis is a binary indicator of attrition (=1 for households with attrition status) and I used a set of household and village characteristics in 2000 as explanatory variables. Table 3.2 presents the regression results, which show outcomes similar to the mean tests. The probit analysis identifies one additional village level factor associated with attrition: households that suffered from floods in the survey year were less likely to go missing from the sample. The probit estimates do not show a systematic pattern of attrition based on household wealth, education level or migration status. It can be concluded that the pattern of sample attrition does not seem to present strong selection bias, except for some village level economic indicators. The IRRI/BIDS/BRAC data, therefore, serves as reliable information source for conducting quantitative analysis on rural households in Bangladesh.

CHAPTER 4

The Changing Landscape of International Migration:

Evidence from Rural Households in Bangladesh, 2000-2014

4.1 Introduction

Migration is now an important livelihood option for many households in developing countries. Aid communities and the governments of developing countries are paying increased attention to international migration as a key driver of development. In spite of high expectations for the role of international migration in poverty reduction, empirical evidence suggests that international migration is a largely middle-class phenomenon, often inaccessible to the poor (de Haas, 2010a; Massey, 1990). As discussed in the literature review (Chapter 3), high cost of international migration constitutes an entry barrier. Migrants tend to be positively selected on the basis of education and skills (de Haas, 2010b; McKenzie and Rapoport, 2010; Portes, 1979). Meanwhile, the literature also suggests possible ways by which the poor and the less educated gradually avail themselves of international migration. The development of migration network is said to assist the poor to take up overseas jobs by reducing various costs of migration (de Haas, 2010a; McKenzie and Rapoport, 2007; Stark et al., 1986).⁷

The existing literature depicting changing characteristics of international migrant households in the past and at present mostly focuses on Mexico-US migration.⁸ This is

⁷ Abramitzky et al. (2013) provide an interesting case where the asset poor migrated actively. Based on data of historical migration from Norway to the US, they found no evidence of asset-related entry barrier when migration was affordable. When the immigration policy of the US became increasingly restrictive, the cost increased, and blocked the poor from further migration.

⁸ One exception is Sharma and Zaman (2013), which presents the outcome of the determinant analysis on international migration in Bangladesh using survey data collected in 2007. They find that the level of

one of the largest migration corridors in the world (UN, 2015), and the research on this corridor has accumulated detailed longitudinal data on migratory patterns. But, each migratory route is built on unique economic and social conditions within diverse institutional frameworks that affect labour mobility, so the characteristics of migrant households may differ substantially among regions. Therefore, similar studies of other regions are needed to determine whether the changing pattern of migrant households found in the Mexico-US case can explain migration patterns in other parts of the world.

This chapter makes an inquiry into the socio-economic characteristics of international migrant households using the case of Bangladesh. It explores the roles of financial, human and social capital in determining international migrant household and examines how the importance of these forms of capital changes over time, using household panel data collected in 2000, 2008 and 2014. It is expected to contribute to a better understanding of the determinants of international migration in the past and at present by providing empirical evidence based on a migration route and region seldom studied for this purpose.

The rest of this chapter is organized as follows. The next section proposes testable hypotheses and the section three examines the descriptive data. Section four presents an empirical approach to the identification of changing characteristics of migrant households, followed by the results of my main analysis. Section five reports the results of supplementary analyses and discusses possible mechanisms by which the main results are obtained. Section six offers conclusions.

human capital was positively correlated to the probability of migration, while that of financial capital measured by owned land size did not show statistically significant predictive power. Since the study only uses sample households located in selected districts with a high incidence of international migration, the findings is not nationally representative. Also, it is not clear whether there are any changes in the determinants of international migration over time.

4.2 Hypothesis

Social theories on migration predict positive selection of migrant households based on financial, human and social capitals (de Haas, 2010a; Massey, 1990; also see Chapter 2 section 2 for more detail discussion). The positive selection pattern can change over time as migration network develops and reduces the cost and risks associated with migration, letting households with less endowment in those capitals participate in international migration. I hypothesize that this scenario generally holds in Bangladesh, but with some variations due to the specific nature of international migration and economic environment in the country as I describe below.

On the role of human capital, I hypothesize that high education level is associated with migrant households in early phase of migration because migrant jobs are considered demanding and require good communication and information gathering skill (McKenzie and Rapoport 2010). However, it is likely that high education is no longer a prerequisite for households sending their family members abroad in recent years. Growing labour demand in major destinations is largely for unskilled workers and that improved migration network and information flows facilitate a better match between worker's qualification/skills and job requirements. In addition, for the past several years, the economy of Bangladesh grew substantially, creating more favourable employment opportunities at home.⁹ It is plausible that some households are starting to refrain from migration as a result of increasing opportunity costs and that the trend may be more pronounced among comparatively educated households because the return on

⁹ Since 2010, it recorded an annual growth rate of more than 6%, and the unemployment rate declined from 5% in 2009 to 4.3% in 2014 (WDI, 2016). Real wages dipped due to political instability between 2006 and 2008, but increased steadily after 2010 (Zhang et al., 2013).

education generally increases with the development of non-farm sectors in rural areas (Estudillo and Otsuka, 2016).

On the role of financial capital, it is probable that family financial assets is a critical determinant of international migration in Bangladesh because the cost is high and recursive. According to a survey conducted by the World Bank and the International Labour Organization (Abella and Martin, 2015), Bangladeshi migrants paid the highest average migration cost among all the Asian migrants sampled in the Middle East. Foreign employers and brokers routinely sell visas to Bangladeshi agents and job seekers, raising migration costs to the level of 1-2 years of earnings. Most migrants are employed on short-term contracts and return home after two to three years. Migration cost is incurred again when a migrant renews a contract.

Meantime, some notable changes may have lowered the financial entry barriers to international migration. Increasing number of households in Bangladesh rely on overseas jobs as a primary source of income. The welfare-increasing impacts of migration are documented by some studies (Mendola, 2008; Ralihan, 2008; Sharma and Zaman, 2013) and are witnessed by the general public. The government has introduced policies to reduce the direct and indirect costs of migration (OSCE et al., 2006).¹⁰ For example, bilateral agreements signed with some destination countries, including Korea and Malaysia, set a ceiling on recruitment fees. Financial institutions including microfinance have introduced lending programs for international migration. The above factors likely encourage the relaxation of liquidity constraints. Small landholders in rural areas actively seek off-farm employment because population pressure exacerbates

¹⁰ Bangladeshi government instituted a dedicated ministry (Ministry of Expatriates' Welfare and Overseas Employment) in 2001 to deal with the administration on overseas employment.

land scarcity (Nargis and Hossain, 2006). If the liquidity constraints are relaxed, small land holders may be more likely than large landholders to migrate abroad. I therefore hypothesize that land and other asset ownership has become a less important determinant of international migration.

The literature shows that the development of migration network plays a critical role in determining who migrates and who does not. The level of network reflects historical, cultural, social and economic factors that are associated with the determinants of migration in each village (Massey, 1990). I argue, however, that the strength of migration network may be limited and not sustained over time in the context of Bangladesh. Most Bangladeshi migrants are employed on short-term contracts in the Middle East and in Asia, and many of the recipient countries do not allow foreign workers to apply for permanent residency.¹¹ As a result, migrants may have weak social connections and economic base at destination, which limits their ability to refer jobs to their family members and friends. The available literature does not provide evidence of change in the explanatory power of migrant network over time.

Recruitment (placement) agencies offer alternative channel of job referral and contribute to the weakening the role of migration network that is traditionally based on family and social ties (de Haas, 2010b). In the initial phase of migration, these agents are said to mobilize workers from villages close to Dhaka where their offices are located. The agents, however, also routinely look for new source communities to sustain their business as they cannot always expect their customers to use their service for the next migration; once migrated, people tend to rely on their social network (as opposed to

¹¹ Except for the highly skilled who are allowed to bring their families and have the right to access residency in the selected destination such as Singapore.

agents) to access jobs abroad for themselves and for their family members.¹² Due to this practice, agents likely expand their operation, in more recent years, to villages further away from Dhaka with no experience of overseas migration. In addition to the presence of agents, rapid development of information technology increases availability of information and means of communication (e.g. mobile and smart phones) among rural households, and contributes to facilitating their access to overseas jobs. I therefore hypothesize that migration network, while important, plays an increasingly lesser role in predicting the occurrence of international migration.

4.3 Data description

Data

This study uses the household survey data set collected by the Bangladesh Institute of Development Studies (BIDS), the International Rice Research Institute (IRRI) and the Bangladesh Rural Advancement Committee (BRAC) (see Chapter 3 for the detail on this data source). This study examines datasets from the panel surveys conducted in 2000, 2008 and 2014, because the data for these years contain more information on the pertinent village characteristics than the data for other years.

Descriptive Data

Table 4.1 provides descriptive data of the sample households grouped by migration status in 2000, 2008 and 2014. Over the years, the proportion of international migrant households (defined as a household with a family member(s) working overseas at the

¹² According to my interviews with migrant households, this practice substantially reduces the risk of being cheated by agents and employers.

time of survey) has increased from 8% in 2000 to 11% in 2008, and to 14% in 2014.¹³ Some of the characteristics differ significantly between migrant and non-migrant households across years. In 2000, the average education level of household adult members (above 16 years old) in migrant households was 0.2 years higher than that of non-migrant households, but the difference is not statistically significant. In 2008, the difference increased significantly; the average education level of migrant household adult members was 1.7 years higher than that of non-migrant household members. In 2014, however, the trend reversed, with migrant households having an average of 0.6 years less education than non-migrant, a statistically significant difference.

Migrant households had greater land asset endowment than non-migrants in all three years of survey periods. The difference in average land assets was large in earlier years (0.4 ha in 2000) and decreased by 75% (to 0.1 ha) in 2014. That narrowing gap may reflect a change in the pattern of migration decisions.¹⁴ Some differences in village characteristics are also observed between migrant and non-migrant households. Migrant families generally resided in villages with good access to district towns in all surveyed years, but this characteristic has disappeared over time. The villages of migrant families are, on average, closer to Dhaka than those of non-migrant families.

Table 4.2 shows the individual level characteristics of migrant workers for each survey year. Despite the rise in education level of the general population, the average education level of migrant workers declined slightly, from 7.8 years in 2008 to 7.4 years

¹³This is comparable to the result of the Household Income and Expenditure Survey (HIES) conducted by the government of Bangladesh in 2005, which shows that 9% of households have migrant(s) abroad (Raihan et al., 2008).

¹⁴ An average size of land owned by any household declines due to increase in population (0.5 ha in 2000 to 0.4 ha in 2014) and this may partly explain the narrowing gap between the two groups.

in 2014.¹⁵ The average real annual remittance in 2000 was BDT 122,000 (US\$ 1,754), increasing to BDT 141,000 (\$2,026) in 2008 and then declining to BDT 132,000 (US\$ 1,899) in 2014. Average migration cost fluctuated similarly, and was roughly 1.7-1.9 times the size of annual remittances. Another noteworthy characteristic of migrant works is that the mean duration of migration increased from 50 months in 2000 to 91 months in 2014. Most migrants find overseas jobs through the referral of agents, distant relatives, and friends.

Table 4.3 provides a list of the destination countries of international migrant workers in 2014. The majority of those migrants are working in the Gulf or Asia, while a small proportion finds employment in Europe and North America. The country hosting the largest number of Bangladeshi workers was Saudi Arabia (26%), followed by the United Arab Emirates (UAE) (20%) and Malaysia (13%). Almost all international migrants in the survey sample are male; there were only 4 and 8 female migrants in 2008 and 2014 respectively (not shown in tables).

4.4 Empirical approach and results

I identify major characteristics of the international migrant households using the following linear probability model;

$$MigrantHH_{ijkt} = \alpha_t + \beta_{1t}HH_{it} + \beta_{2t}Vill_{jt} + \beta_{3t}Mignet_{jt-1} + \rho_{kt} + \varepsilon_{ijkt}, (1)$$

The dependent variable has value 1 if household (*i*) has one or more household members abroad for work at the time of survey in year (*t*=1,2,3 which represents survey

¹⁵ Between years 2000-2013, mean schooling years among adults in Bangladesh increased from 3.7 years to 5.1 years (UNDP, 2016).

data of 2000, 2008 and 2014, respectively).¹⁶ We used robust standard error in our estimation to address possible heteroscedasticity in error terms in linear probability model.¹⁷

HH_{it} is a vector of the characteristics of household (i) in survey year (t), and includes land assets (in log),¹⁸ ¹⁹ non-land assets, education level of workers, and information on household member composition such as number of adults and dependency ratio of the old and young members. I used the proportion of household's workers with highest level of education completed (among the six education levels, illiterate, primary education, up to post graduate) as the variable representing household education level.²⁰ Indicator variables of household access to electricity (=1 if yes) and flood damage (=1) in the survey year are also included.

$Vill_{jt}$ is a vector of the characteristics of village ($j=1,2,\dots,62$) in survey year (t); it reflects economic infrastructure and labour market conditions. It includes travel time to the district town and to the nearest bank branch as well as distance to the capital city, Dhaka. $Vill_{jt}$ also includes the proportion of non-migrant or home-based workers

¹⁶ I wanted to identify households with workers abroad for at least a few months but this was not possible because the only data available for some migrants was the year of departure. Note that the main occupation of a small number of migrant workers is student and that they earn cash to send home by doing part-time jobs.

¹⁷ I also conducted analysis using probit model

$\Pr(Migrant\ hh_{ijkt} = 1) = \Phi(\beta_{1t}HH_{it} + \beta_{2t}Vill_{jt} + \beta_{3t}Mignet_{jt-1} + \rho_{kt})$ where Φ is the cumulative normal distribution function. Results are comparable to the linear model (Appendix Table A4.1). The regression outcome generated by this model, however, is not free from heteroskedastic errors according to the results of Lagrange multiplier and likelihood ratio tests (Wooldridge 2010).

¹⁸ The literature points to the presence of non-linear relationship between asset and the likelihood of migration (McKenzie and Rapoport, 2010; VanWey, 2005). I tried fitting squared term of land asset to my specification, but it was insignificant. The exclusion did not change my main findings.

¹⁹ Due to the conversions of land size in log scale, landless (4% of total sample) are omitted from the estimation. A very small number of landless households are international migrant households (1, 4, and 3 households in 2000, 2008 and 2014 respectively), and most landless households are still excluded from overseas employment option to date. Sensitivity check using the level and squared terms of land asset in place of log-scaled value does not change my main findings on land holdings.

²⁰ I did not use household heads' education level as a measure because migrant households likely designate migrants' female spouses or parents as heads.

employed in the non-farm sector in each village; this is constructed using observations from sample households. This variable, representing non-farm labour participation, may be endogenous because a migrant household may receive remittances, which could help to create more non-farm jobs for the household members. To reduce this bias, I construct the variable village-level non-farm sector participation by subtracting own household (i). The equation also included division dummies in the regression to control for division specific unobserved effects, denoted as ρ_{kt} ($k=1,2,\dots,6$) in the equation above.

The last covariate $Mignet_{jt-1}$ captures the level of social capital that facilitates migration at village level. I constructed two variables, one for international migration network and one for domestic migration network. These networks are defined as the proportion of migrant workers abroad (or in country) among the total working members of the sample households in each village regardless of their current location (i.e., both domestic and international migrants are included in the denominator). This variable suffer from simultaneity and likely endogenous because the network levels may be correlated to unobserved household and/or village attributes that influence the probability of migration. To control for the endogeneity, I use lagged values of international and domestic migration network in the estimation. Lagged value is commonly used to address selection bias in the migration literature (Quisumbing and McNiven, 2010; Mendola, 2008; McKenzie and Rapoport, 2007). I used migration network for 1988 as an explanatory variable for the observations for 2000. For observations for 2008 and 2014, migration network in 2000 and 2004, respectively, are

used. It is to be noted that the use of lagged network value as independent variable must be carefully evaluated.²¹

The results of the regression based on Eq.(1) identify important factors associated with the characteristics of international migrant households, but there is the possibility of reverse causality. The financial and human capital of households that send migrants for long periods of time likely captures the impact of migration. For example, some parts of the land owned by a migrant household might have been purchased with remittances. Therefore, following McKenzie and Rapoport (2007), the study conducts an analysis with alternative specification that controls for reverse causality by focusing on the households that initiate migration;

$$NewMigHH_{ijkt} = \alpha_t + \beta_{1t}HH_{it} + \beta_{2t}Vill_{jt} + \beta_{3t}Mignet_{jt-1} + \rho_{kt} + \varepsilon_{ijkt}, (2)$$

The dependent variable of Eq.(2) is *NewMig hh_{ijkt}* which takes value 1 if the household is a new migrant household. A new migrant household is defined as a household which sends worker(s) abroad for the first time in the period between three years prior to the survey year and the survey year for each survey year *t*.²² Using this definition, I examined the migration history of surveyed households and found that there were 127 new migrant families in 2000, 83 in 2008, and 76 in 2014. In this

²¹ For example, Gibson et al. (2013) caution the use when outcome variables are the indicators of migrant household wellbeing because of the possible correlation between the lagged network value and household unobservable characteristics. As to the method of employing lagged explanatory value to control for possible endogeneity such as reverse causality, Bellemare et al., argue against the use because lagged value continues to produce autocorrelations in error terms (Bellemare et al., 2015).

²² For example, new migrant households in survey year 2008 are those initiated migration for the first time between 2005 and 2008.

estimation based on Eq.(2), I use restricted samples conditioned on no past history of migration.²³

Results: linear probability models

Table 4.4 presents the results of the regression based on Eq.(1) and (2). Columns (1) to (3) show the results of regression on all migrant households using observation for 2000, 2008 and 2014, respectively (Eq.(1)). Columns (4) to (6) present the results for analysis using new migrant households as a dependent variable (Eq.(2)).

Education

The results of regression show significant effects of household education level on the probability of being a migrant household. The estimates based on Eq.(1) show that households with a large proportion of workers with high secondary education (9-12 years) are likely to have international migrants in all years. I find that the effect of education changes over time. The coefficient of workers with junior secondary level of education (6-8 years) was insignificant in 2000, but turns significant in 2008 at 0.064 and increases to 0.084 in 2014. The coefficient of workers with primary education (1-5) also increases and becomes significant at 0.032 in 2014, showing that lower education levels are increasingly contributing to the likelihood of migration.

When I use new migrant households (Eq.(2)) to examine the correlation between education and probability of migration, there is a statistically significant relationship between the coefficients of higher education level (master/Ph.D.) in 2000. This

²³ This specification removes 507 households from my sample; these households had migrants in the past or continue to send them. Inclusion of these households in my analysis as additional reference group, however, does not significantly alter my main result.

relationship, however, disappears in later periods. This suggests that the positive association between education and likelihood of migration is declining in recent migration.

Land and non-land asset

The results based on Eq.(1) reveal that size of land holding has a positive and significant effect on the likelihood of migration in all surveyed years. This lends support to my hypothesis that land ownership is an important determinant of migration because it likely provides the means to pay for the initial cost of migration. The positive impact, however, becomes smaller and less significant in the last two periods, with the coefficients decreasing from 0.016 in 2008 to 0.007 in 2014; during this period, the entry barriers to international migration based on land assets decreased. The effect of non-land asset turns negative and significant in 2014.

The regression results of the Eq.(2) also show a positive effect of land ownership on probability of new migration in 2000. However, the coefficients are not significant in later years and negative in 2014, so land ownership is no longer a predictor of the probability of migration among new entrants. The coefficients of non-land assets show a similar pattern of association to that of Eq.(1).

Other household characteristics with significant correlation to the likelihood of migration include number of adults (working-age members) in households in 2008 and 2014. This is likely due to the fact that households tend to send additional household member(s) abroad if possible.²⁴ Higher dependency ratio of elderly members in a

²⁴ At the same time, families left behind by migrants tend to live with relatives, increasing the household size of a migrant family.

household contributes positively to the likelihood of migration in 2000 and 2014. The dependency ratio of young children is significant in 2014 (for Eq. (1)) and in 2008 (for Eq. (2)) where it is negatively associated with the likelihood of migration (or new migration). This suggests that the presence of young children deters migration likely because they need parental care.

The occurrence of natural disasters reduces the likelihood of migration in 2000, but increases the probability of being a new migrant household in 2008. It should be noted that in 2008, the large cyclone *Sidr* hit the country with devastating effect in many areas.

Village characteristics and economic infrastructures

Some village characteristics also present strong effect on household probability of migration. Households in villages closer to Dhaka are more likely to migrate in 2000 as indicated by the negative coefficient of distance for both specifications. This suggests that recruitment agents with offices in Dhaka mobilize workers from villages closer to Dhaka for convenience.²⁵ Proximity to Dhaka also reduces recruitment costs as workers have to travel to Dhaka to process passports and to travel abroad. Distance to Dhaka, however, is not an important determinant in 2008 and 2014. As I mentioned in my hypothesis, this may imply that agents are now recruiting new workers from areas farther away from Dhaka. Easy access to district towns also contributes to increased likelihood of migration in most years; the coefficient for 2008 is nearly double that for 2000 (Eq.(1)). It is likely because district towns are important information dissemination points and also provide access to long-distance transportation facilities.

²⁵ Agents are required to establish their head offices in Dhaka by the law.

One of the proxy variables of village level economic infrastructure is travel time to the closest bank branch. The results show that households with such favourable economic infrastructure are more likely to migrate in 2000, but the sign of the coefficient is reversed in 2014. Furthermore, the variable is not significant in 2008 and 2014 for the estimates based on Eq.(2). Availability of non-farm jobs in villages shows negative association in 2014 but it does not explain the likelihood of migration in consistent manner across years. This suggests the absence of sustained trade-off between availability of home-based jobs and international migration.

International and domestic migration network

I find that international migration network is a strong and significant explanatory variable that positively predicts the likelihood of migration. Yet, it is noteworthy that the explanatory power of this variable declines between 2008 and 2014. In the first specification, the probability of international migration depends less on the occurrence of international migration in villages; the coefficients decline from 1.536 in 2008 to 0.992 in 2014.

The analysis using new migrant households lends further support to the finding above and to the proposed hypothesis. The coefficients of international migration network decline from 0.770 in 2000 to 0.458 in 2008. In this specification, it is notable that the coefficient was not significant in 2014, indicating that network no longer has a statistically significant effect on new migration. It is not unusual for migration networks to grow or die out over time (de Haas 2010b), so past level of network may not fully

explain likelihood of migration. However, it is surprising to find that it loses significance completely.²⁶

I also used lagged value of domestic migration network to determine if there is any relationship between domestic migration and likelihood of international migration. The coefficients are not significant except in 2008 where it shows negative association with the likelihood of international migration.

Fixed Effects Estimation

The estimates suggesting reduced entry barriers to international migration are biased if they suffer from omitted variable problems. Innate ability of a household, for instance, may be positively correlated to human, financial and social capital, resulting in estimates with upward bias. Exploiting the panel structure of the data, I additionally implement household fixed-effects estimation to control for time-invariant unobserved household and village characteristics by adopting the linear probability model. Fixed-effects estimation adds support for the main findings by allowing robust inference on the causal relationship. Linear probability model with household level fixed effects is given as follows;

$$Migrant\ hh_{ijkt} = \gamma_i + \delta_{1t}HH_{it} + \delta_{2t}Vill_{jt} + \delta_{3t}Mignet_{jt-1} + \rho_{kt} + \varepsilon_{it}, (3)$$

where γ is household fixed effects. I use the same covariates as in Eq.(1) but remove one that is time-invariant.²⁷ I interacted all independent variables with two time dummies (t=2, and t=3) and used pooled observations of three years to compare

²⁶ It is worthy of further investigation to verify this finding using other data source; since my data uses stratified samples of households within selected villages to construct village network variable, it is not entirely free from measurement errors.

²⁷ It is distance to Dhaka (km).

coefficients across years. In this model, I restrict my samples to balanced panel by removing households that were newly added or disappeared between survey periods. The fixed effects estimation uses change in household migration status from previous survey round as the source of variations (i.e. it examines the association between the changes in household migration status from previous survey year and accompanying changes in household/village/network characteristics). This contrasts with Eq.(1) that identifies characteristics of all migrant households (including all-time migrant households that did not change migration status from previous survey round).

The results of household fixed-effects model estimation, presented in Table 4.5, support my earlier findings from linear probability model estimates, showing gradual participation of migration among households with relatively low education and assets. The coefficient of the proportion of workers with secondary education level (6-8 years) is 0.06 and statistically not significant in the year 2000 (base year), but the coefficient of the same variable in 2008 is significant and greater than that of 2000 by 0.073. That of 2014 is also larger than the base year by 0.069. Similarly, the coefficient of the primary education level (1-5 years) is insignificant at -0.000 in the base year but that of 2014 is significant and greater by 0.041. Meanwhile the coefficient of mid-high secondary education level (9-12 years) is positive and significant (0.115) with no observed difference in the coefficients across years. As to the financial capital, household land assets show no association with the probability of migration, but it presents negative correlation in 2014. Non-land assets contribute positively to the likelihood of migration, but the contribution disappears in subsequent survey years. One notable difference in the fixed effects estimates compared to those of cross sectional analysis is the effect of

migration network in all years; the change in level of network does not explain well the change in likelihood of international migration. This is not surprising because I saw in the earlier estimations that the network fails to explain the incidence of new migrant households. Although network explains occurrence of migration overall (including long-term migration), it contributes little to explaining change in migration status. It is worth noting, however, that the coefficients of international migration network in fixed effects estimation do decline over time and that that of 2014 is smaller than that of 2000 by 0.509.

4.5 Factors contributing to the change in the landscape of international migration

The estimation results suggest that, between 2000 and 2014, the landscape of international migration among rural households in Bangladesh changed substantially, and that barriers to entering into international migration based on education, assets and migration network eased. In this section, I explore some of the factors that may have contributed to these changes. The first question asks why households with comparatively less educated workers are increasingly participating in international migration. I explored this question by examining the demand side of migrant labour markets and home employment opportunities. The second question relates to the declining role of household assets in predicting probability of migration. I examine the data to determine whether the cost of migration has declined or if migration network played any role in reducing that cost. I also consider the availability of external financing to pay for migration costs.

Factors contributing to widening education levels

One key factor that likely contributes to increased participation of low-educated migrant households is the nature of the demand for migrant workers. Table 4.6 presents the results of multinomial logit analysis of migrant households by destination region in 2014.²⁸ I find that education level of workers in a household differs substantially among destination regions. There is evidence that workers with lower education actively migrate to the Middle East and Asia (columns (1) and (2) in Table 4.6). In particular, the coefficient of primary education is positive and significant for households with workers in the Middle East. While the early period of migration to the Middle East and Asia probably involved relatively educated workers to deal with perceived risks and uncertainties of migrant jobs, it is likely that the required education level has decreased to the point where it matches the job requirements. The major sectors that employ migrant workers in these regions are construction and services. The education levels of workers are substantially higher among households with worker(s) in North America and Europe than those with workers(s) in the Middle East and Asia.

Growth in the home economy may also explain the widening of education levels of migrant household workforce. In my earlier estimation, I did not find clear and sustained evidence supporting the substitution hypothesis (i.e. that domestic migration network is negatively associated with likelihood of overseas migration) (Table 4.4). To examine this hypothesis further, I analyse the determinants of wage, including returns to education, in different work locations to understand how households with varying educational endowment choose work locations. I have information on the monthly

²⁸ I am unable to conduct this analysis using samples for earlier years due a lack of information.

salary of domestic and international migrant workers in 2014 and I used this variable (in log form) to analyse variation in returns to education by work location. Since I use worker level information in this analysis, covariates include worker characteristics (age, gender and education) along with other household and village characteristics variables used in earlier analysis. The Heckman selection model is employed²⁹ to address selection bias for each worker category. The instrumental variables are number of workers per household and lagged international and domestic migration networks. These variables are associated with choice of work location, but do not seem to affect level of salary directly, except through choice of location.

The results of the regression on monthly salary show that salary from international migration does not seem to reward schooling for most workers except for those with tertiary education and above (column (3) in Table 4.7). This is in clear contrast to the results of out-district domestic migration, which shows increasing returns to education (column 2). The wage premium of international migrant salary is represented by the large constant term. Domestic jobs rather than overseas jobs reward education for workers with mid-level education; this seems to imply that the opportunity costs for international migration are high for those with substantial education.

Factors contributing to declining asset holdings

I find evidence that households with relatively few assets are migrating in recent years. It is likely that the direct and/or indirect costs of migration have decreased and made

²⁹ I have also estimated this model using selection bias correction terms based on multinomial logit (Kurosaki and Kahn, 2006) and find that the results are consistent.

migration affordable. The existing literature identifies development of migration network as a factor contributing to the reduction in cost (McKenzie and Rapoport, 2007; Stark et al., 1986). I test this hypothesis using the survey data on the direct cost of migration (=amount spent to send workers abroad³⁰). Since most migration is temporary and migration cost is incurred each time a worker migrates or re-migrates, this information likely reflects the prevailing cost of migration in the village at the time of survey. I conducted simple pooled OLS regression analysis on the price adjusted cost of migration in 2000, 2008 and 2014 (in log value) using the same covariates as in Eq.(1). The regression outcome shows no significant or consistent association between international migration network and cost of migration among the sample in all years (see Table 4.8).³¹ This is consistent with my earlier finding that village level migration network shows weaker correlation with the likelihood of migration in recent years. Meanwhile, the descriptive data (Table 4.2) shows a decline in price-adjusted average migration cost from 2008 to 2014 (decrease by BDT 25,990 or by 11.9%) and this decline may have allowed some households to seek jobs abroad.

I find some evidence of a decrease in the indirect cost of migration stemming from the cost of borrowing. Figure 4.1 presents the primary source of funds from which new migrants³² finance their first migration. I classify sources of funds into three categories: 1) self-financing, including own savings and the sales of assets; 2) borrowing based on collateral (assets) or land lease; and 3) borrowing and grants

³⁰ It includes costs of obtaining travel documents, domestic and international travel, and agent/handling fee. I have this information for each worker who was found abroad at the time of survey in 2000, 2008 and 2014.

³¹ I did not control for variations in destination country in this estimation because the choice is considered endogenous. This can make estimation rather noisy because costs likely reflect expected earnings, which differs widely by destination.

³² A new migrant is defined as those who migrated for the first time between the year $t-3$ to year t for each survey year t .

without collateral (from families, relatives and NGOs). Access to the last source of funds likely helps the asset-poor to finance migration cost. The figure shows that the only 6% of new migrants availed themselves of non-collateral loans and grants in 2000, but the figure increased to 19% and 52% in 2008 and 2014, respectively. Increased access to non-collateral loans and grants must have substantially relaxed liquidity constraints of these households³³. One factor contributing to the increased access to borrowing is the diffusion of international migration. As much as 14% of rural households have family member(s) working abroad in 2014, and up to 21% of them have had migrant family members in the past decade. It is likely that international migration gained recognition as dependable and relatively trustworthy ventures.

Factors contributing to declining migration network

The result of the estimations lend indirect support to the evidence that the main factors contributing to the declining influence of network likely include the presence of recruitment agents that can facilitate overseas jobs for households with no prior experience of migration. In addition, mobile and smart phones are readily available in villages, providing increasingly easy access to information on overseas jobs and agents. Furthermore, some external factors may have also reduced the importance of networks in recent years. Bangladesh has suffered substantially from the moratoriums on new hire imposed by major destination countries in recent years (Economist, 2013). Major destination countries including Saudi Arabia, UAE, Kuwait and Malaysia imposed recruitment moratoriums ranging from few to several years. As shown in Figure 1.1, the sanction imposed by Saudi Arabia is particularly hard-felt; it resulted in a sudden and

³³ Those households which accessed non-collateral loans are poorer than other migrant households or non-migrant households when the size of owned land or education level is considered.

very sharp drop in new deployment from 2008 onward. These moratoriums make it difficult for migrant workers to secure jobs and to find jobs for others. This precarious nature of migrant legal status in the Middle East and Asia stands in sharp contrast to that in North America and Europe, where long-term residency status is granted to migrants of various skill levels and is seldom revoked.

4.6 Conclusion

In this chapter, I examined the characteristics of the beneficiaries of international migration in rural Bangladesh for the period 2000 to 2014. The findings strongly suggested that entry barriers to international migration based on financial, human and social capital have decreased in recent years and that international migration had become a more accessible livelihood option for households of various levels of resource endowment. I also found that the role of migration network in predicting likelihood of migration waned over time, in contrast to the findings of previous studies on Mexico-US migration, where network plays a dominant role in determining who migrates and how much it costs (McKenzie and Rapoport, 2007; Stark et al., 1986). The limited role of migration network in Bangladesh likely reflects a particular pattern of migration found in the Asian region, namely temporary migration with limited opportunity of access to permanent residency abroad. The active role played by recruitment agents may also have contributed to this process. The results therefore point to the possibility that the role of social capital in determining international migration decisions may differ substantially by region.

My results also indicate that entry barriers to international migration based on financial and human capital declined due to factors other than social network. These factors included the composition of the destination countries and increasingly favourable employment opportunities in the home country. I found some evidence that liquidity constraints likely declined as international migration became one of the main livelihood options for many rural households.

The results of this study demonstrated the value of examining the determinants of migration using the example of migration routes, which is seldom studied. Similar studies of other migratory routes may also contribute to refining existing knowledge and models.

CHAPTER 5

An Inquiry into the Heterogeneous Outcomes of International Migration:

Evidence from Rural Households in Bangladesh

5.1 Introduction

A growing number of empirical studies have attempted to determine whether remittances are invested in physical and human capital, which can lead to long-term enhancement of welfare among migrant households in origin countries. As shown in the literature review (Chapter 2), some studies have found evidence that migration and remittances have a positive impact on investment in small business start-ups, agricultural equipment, land improving technology and adoption of high yield rice varieties (Böhme, 2015; Mendola, 2008; Yang, 2008). Similarly, positive impact is found on investment in human capital through increased education expenditures and improved school enrolment rates and attainment (Acosta, 2011; Mansuri, 2006; Edwards and Ureta, 2003; Yang, 2008). Other studies, however, report no or negative impact. For example, Ang et al. (2008) did not find significant impact of remittances on education and health. Prolonged migration is found to contribute to decline in agricultural productivity (Azam and Gubert, 2006; Rozelle et al., 1999). Negative impact on human capital development is also reported: migration can pull boys out of school and add more housework to girls' load (McKenzie and Rapoport, 2011). Thus far, the empirical evidence on the impact of migration and remittances on investments is mixed.

These mixed results may reflect differences in the prevailing forms of migration

of the area studied as well as the ways in which the impact is estimated. The estimation of the impact of migration on investments often relies on the use of a binary indicator of migrant or remittance recipient household.³⁴ The use of the dummy masks different types of outmigration while assuming that the coefficient identifies an average impact of migration. However, in reality, migrant households and their migration behaviours are highly heterogeneous. First of all, the duration of migration varies from several months to lifetime. Secondly, intensity of migration (number of migrant workers and the size of remittances) differs across households. Thirdly, some households have undergone migration for some period but no longer do so. These households are in a particular stage of migration, in which return migrants may want to invest their savings in profitable endeavours.

Evidence suggests that these variations in the intensity, duration and stages of migration can have a varied effect on the well-being of household members left behind (Gibson and McKenzie, 2013). Growing literature on return migration also notes that returned migrant households actively invest accumulated savings and overseas work experience in entrepreneurial activities (Dustmann and Kirchkamp, 2002; Memurger and Xu, 2011; Piracha and Vadean, 2010). In contrast, a household that has just initiated migration is highly unlikely to invest elsewhere since it has chosen to invest in migration (de Haas, 2011; Clemens and Ogden, 2014). In order to control for heterogeneity in forms of migration, the existing literature uses variables such as number of migrant workers or annual remittance values in place of (or in addition to) migrant dummy (Ang et al., 2009; Quisumbing and McNiven, 2010; Yang 2008). However, the use of these alternative variables can address only the heterogeneity in

³⁴ For example, Böhme (2015), Mendola (2008), and Taylor and Lopez-Feldman (2009) use migrant binary indicator for estimation.

intensity of migration. Inability to control for heterogeneity with respect to duration and stages of migration is particularly problematic when the predominant form of migration at stake is temporary and circular: migration experience can vary substantially among participating households in such context.

In the presence of large heterogeneity in the forms of migration among the participating households, it is challenging to assess accurately the average treatment effect of migration on investment. The challenge is greater if the uncontrolled heterogeneity interact with investment decisions in the opposite direction, as may be the case for new and return migrant households. It is, therefore, worth examining the relationship between different forms of migration and the investment patterns. This study focuses on variance in stage of migration as a source of heterogeneity and examines the relationship with household investment outcome. Using two-period panel data set, I classify migrant households into three categories: i) those that initiated migration between the first and second periods; ii) those that continued migration throughout the two periods, and iii) those that ended migration after the first period. I test the hypothesis that these groups exhibit different patterns of change in investment.

There are a number of issues and challenges in the proposed analysis on the relationship between differing stages of migration and investment. Firstly, the data requirement is high. Categorizing migrant households into distinct migration stages requires detailed migration history. This study uses unique panel data series on rural households in Bangladesh, supplemented by an additional migration module containing information on migration history. Secondly, there are multiple sources of endogeneity. Family members make the initial decision to migrate or not and subsequently decide to continue or end migration once they had migrated on the basis of migrant's or family's

interests. Thus, households with migrants might be systematically different from those without, and those with continuing migrants might differ systematically from those with returned migrants. Therefore, self-selection could be an issue when identifying the causal effect of migration. The presence of reverse causality is another concern; migrants may only decide to return if they make successful investment or their villages have good economic infrastructure and business opportunities. I address some of these concerns by exploiting the panel structure of the data. Given the multiple sources of endogeneity, however, my results are best interpreted as an examination of the effects of heterogeneity on investment outcome among households in differing stages of migration, and not an identification of specific impact or causality of differing migration treatment on investment.

The remainder of this chapter is organized as follows. Section 2 presents my model and hypotheses on the physical and human capital investment patterns among migrants in differing stages of migration. Section 3 explains the data set and examines descriptive statistics specific to each migrant group. Section 4 introduces my empirical model, followed by the presentation of estimation results in sections 5. Conclusions are offered in Section 6.

5.2 Model and hypothesis

The New Economics of Labour Migration (NELM) assumes that migration is a household decision based on the household utility maximization model (Stark and Bloom, 1985; Taylor, 1999). Empirical evidence shows that migration helps household access lucrative jobs, diversify income sources, relax liquidity constraints and reduce

covariate risk (Amuedo-Dorantes and Pozo, 2006; Gubert, 2002; Quisumbing and McNiven, 2010, Matsumoto et al., 2006; Rosenzweig and Stark, 1989; Yang and Choi, 2007). It is then plausible that migration provides more favourable conditions for households to venture into various forms of investment (Mendola, 2008). This seems especially likely in the case of migrants returning after some years of migration with savings and work experience. At the same time, because migration often involves the temporary exodus of workforce with relatively high education, migrant households may not be in a position to consider active investment in new technology and businesses (Rozelle et al., 1999). High migration cost also suggests that migrant households, at least at the initial stage of migration, face high liquidity constraint.

The above discussion suggests that during the process in which a household changes its status from non-migrant to migrant (and *vice versa*), substantial changes take place in household characteristics such as level of human capital endowment, liquidity constraint, and cash flow as well as household willingness to take risk, all of which may influence the investment decision. These changes are the result of either the physical act of migration (departure or return of workers) or the return from migration (remittance and saving). Continuation of migration, similar to change in migration status, may also affect the level of household investment (although in a different manner): it may help households accumulate savings and assets ready to be invested, or it may encourage further migration and pull available resources away from investment at home-based capital.

In order to characterize the relationship between change in migration status and household investment, I propose the following model and hypotheses. Depending on their migration status, households are categorized as i) those which initiate migration

between the two periods (*NEW*), ii) those which continue migration for two periods (*CNT*), iii) those which stop migration and no longer receive remittances (*POST*), and iv) non-migrant households in both periods (*BASE*). Figure 5.1 illustrates my hypothesis on the association between change in migration status and change in the level of per capita investment in physical and human capital, holding other variables constant (*BASE* group is the control group). Also in Figure 5.2, I offer hypotheses on how these migrant households may experience change in per capita consumption.

It is likely that new migrants (Group A-*NEW*) decrease physical and human capital investment from period 1 to 2 (Figure 5.1-A) because they have decided to invest in migration and many of them take loans to pay for migration costs. They continue to face liquidity constraint over the short-term. Inflow of remittances may increase petty cash and day to day consumption level due to the income effect (Figure 5.2-A). This group, however, suffers from (recent) loss of productive family members to overseas jobs, and the migrants may want to save for their future investment.

I hypothesize that post-migration households (Group C-*POST*) increase the level of investment from period 1 to 2 (Figure 5.1-C). It is likely that they have accumulated savings from some years of migration and have paid off their debts. In addition, the *POST* group benefits from the return of migrants with experience working abroad (brain gain). These migrants may also return with additional funds saved at destination. They are more likely to take on investment risk. Meanwhile, I also anticipate that cases of unexpected return due to sudden termination of contract to illness. Therefore, level of investment may present large variation (standard errors) among this group. As for consumption level, the end of migration itself may not immediately change lifetime

income; I hypothesize that the *POST* group does not change consumption level in period 2.

For households that sent migrants for both periods (Group B-*CNT*), I expect that their average investment may remain unchanged in period 2 because there seem to be positive and negative factors associated with the characteristics of these households (Figure 5.1-B). On the one hand, the *CNT* households likely paid off their debts and accumulated funds for investment. On the other hand, on-going migrants may want to use their funds for investment after they return home. This group may, however, invest more in migration rather than home production. Meanwhile, their expected lifetime income continues to rise, pushing their consumption level higher.

5.3 Data description

This study uses the household survey data set collected by the Bangladesh Institute of Development Studies (BIDS), the International Rice Research Institute (IRRI) and the Bangladesh Rural Advancement Committee (BRAC). Detailed information about the data set is found in Chapter 3. Here, I use balanced panel of 2,084 households surveyed in 2008 and 2014. I excluded households composed only of senior members (>50 years old), considering that my variable of interest is investment.³⁵

Migrant Households Classification

I classify 2,084 sample households into 4 groups based on reported migration history: a) base group which had no history of international migration (1,675 HH, or 80% of total sample (*BASE*); b) new migrant group (*NEW*) which sent migrants abroad after 2008

³⁵ 110 households are excluded from my sample on this basis.

and continued to do so in 2014 (116 HH, 5.6%); c) continued migrant group (*CNT*) which has migrant workers abroad in 2008 and 2014 (192HH, 9.2%), and d) post migrant (*POST*) group (103HH, 4.9%) which had migrant workers abroad in 2008 but reported no migrants (or remittances) in 2014. Details on the grouping of migrant households are described in Annex 2.

Table 5.1 presents summary statistics on the migration profiles of the households in each group. The average starting year of the first migration is 2010 for the *NEW* group, 2002 for the *CTN* group, and 2003 for the *POST* group. Total duration of migration in the period 2004-2013 is longest for the *CTN* group at 89 months, followed by the *POST* group at 53 months and the *NEW* group at 21 months. As for intensity of migration, measured by the number of migrants per household, the *CTN* and *POST* groups are more likely to have (had) multiple numbers of family members abroad. Average annual remittance for each group shows that the *NEW* group receives considerably less (99 thousand taka) than the *CNT* group (205 thousand taka) in 2014. The initial cost of migration³⁶ is greater than the annual remittance flow for all groups. For the *NEW* group, the cost is 2.4 times the size of annual remittances; if they take loans to pay for the initial cost of migration, it is unlikely that they will pay off the debt in the first few years of migration. The major destination countries of migrant workers differ among groups due to the changes in demand for Bangladeshi workers. More than half of the migrants in the *CNT* and *POST* groups work in Saudi Arabia, while more workers in the *NEW* group find employment in other Gulf countries such as United Arab Emirates (UAE).

³⁶ The cost typically includes visa/passport fees, agent service fee, and travel costs.

Household and Village Characteristics

Table 5.2 presents the household and village characteristics of the sample households in year 2014, categorized by three distinct migrant and a non-migrant household groups. The change in the value from 2008 is presented in the adjacent column. For *NEW* group, the change reflects their change of status from non-migrant to migrant household between 2008 and 2014; the opposite is the case for the *POST* migration group. I include migrants as household members in my econometric analysis, so that departure or return of migrants *per se* does not affect the household characteristics except for assignment of household head.³⁷

Data show that size (including migrant members) of household with international migrants in 2014 (*NEW* and *CNT*) is larger than those without (*BASE*, *POST*). There is general reduction of family size by 0.57 members (*BASE*) during the period 2008-2014, but the *NEW* group experiences a smaller reduction in household size and shows almost no change in number of working age adults. The dependency ratio of old members in the *NEW* group rises by 0.11 members during the period. This information suggests that old relatives (such as parents of migrants) tend to join the migrant household where the spouse and children remain after the migrant leaves. Average education level of household head (3.59) and all adult members (3.24) of the *NEW* group are the lowest among all four groups.

The *POST* migrant families experience substantial reduction in family size (-2.09 members) and number of working age adult members (-1.32). The *POST*

³⁷ The survey module defines household head as the one who lives in the household and makes day to day decisions. Migrants are not given this status. Therefore the change in migration status sometimes involves change in household head.

households are likely reorganized to form a nuclear family upon the return of migrant workers. The fall in the age of household head (- 8.37 years) and the increase in education of heads (2.12 years) among the *POST* group support this possibility. The average years of education of the *POST* migrant household heads (6.49 years) and household adult members (5.99) are substantially higher than those of the *BASE* group (4.57 and 4.27).

Continuing migrant households (*CNT*) also experience on average a large reduction in household size (-1.04) and number of working age adult members (-0.44) than the *BASE* households. This indicates that some other types of reorganization of household members are taking place as well though the exact reasons for this are not clear. They may include drop out of migrant workers from household membership or children leaving the household due to marriage. The average age of household heads of the *CNT* (51 years old) is higher than that of *BASE* (46 years old). It is anticipated that the average years of education of adults would be higher among the *CNT* households thanks to investment from remittance, but it is surprisingly low, 3.8 years, whereas that of the *BASE* group is 4.3 years. The *CNT* group owns the largest average size of land per household or on per capita, among all groups.

Descriptive data on household characteristics of different migrant categories suggest that changes in migration status may entail changes in the composition of household members other than the migrant nuclear family member. This possibility calls for careful treatment of independent and dependent variables in my estimation model. Relevant outcome variables are therefore adjusted to per capita, adult equivalent or per worker value so that they will not be correlated to the change in household

composition associated with particular migrant status. I discuss this point in more detail in the next section (section 5.4).

There are some unique village characteristics associated with migrant household status (*NEW*, *CNT* and *POST*). On average, migrant households are located in villages closer to their district administrative headquarters and to the capital city, Dhaka. Migrant workers must travel to the district administration headquarters to prepare the necessary documents for passport and visa applications. Better access to Dhaka has several other advantages; recruitment agencies are all located in Dhaka (as required by law) and having better access to those offices increases the chance of obtaining placement, thanks to better information, and reduces travel and lodging costs related to the processing of paperwork in Dhaka or to flying out to the destination country via Dhaka International Airport. These geographical advantages, however, are less pronounced among the *NEW* group.

The *CNT* and *POST* migrant households are located in villages with more favourable economic infrastructure than the other groups (e.g. better access to electricity and bank branches). The *POST* group households are located in villages with a higher proportion of workers employed in non-farm sectors. This data does not reveal whether those favourable conditions were also present during pre-migration periods, but they likely provide lucrative investment opportunities for remittances once migration started. At the same time, good economic structures may also reflect the impact of migration, since the inflow of remittances would likely stimulate local business and employment.

In order to understand the characteristics of three migrant groups in more depth, I conducted multinomial logit analysis, comparing the household and village

characteristics of those groups to the households with no history of migration using observations in 2014. The results (see Appendix Table 5.1) indicates substantial difference among the groups and that education, land ownership and better access to the nearest bank branch, district town, and capital city are all positively associated with the *POST* households.

Household Consumption and Investment

Descriptive data on household consumption and investments is presented in Table 5.3. The proportional change since 2008 is presented in the adjacent column. I use three indicators for consumption; non-food daily expenditure (e.g. consumables and utilities);³⁸ housing repair and construction, and religious and social events. The last two expenditure items can also be considered as investments; a well-built house protects the family against natural disasters, and social and religious events help strengthen social capital. I use adult-equivalent scale for these expenditure items, based on the head count of adults and children physically living in the household at the time of each survey.³⁹ Reflecting the sustained economic development in Bangladesh in the past several years, expenditures on most items grow rapidly between 2008 and 2014.

Table 5.3 shows a clear difference in consumption level between migrant and non-migrant groups and a large proportional increase in daily expenditure (increase by 75% and 114%, respectively) for the *NEW* and *CNT* groups than for the *BASE* and *POST* groups (42% and 66% increase, respectively). Housing construction and repair is

³⁸ I would have liked to use consumption data on food intake (or its monetary value), but this was not possible due to difficulty in measuring the consumption of self-produced products using my survey data.

³⁹ For adult-equivalent value, I used OECD equivalence scale which generates weight by assigning value of 1 to the first household member, of 0.7 to each additional adult and of 0.5 to each child (OECD, no date).

often cited as a main usage of remittances, but my data shows that large increases in expenditure are observed only among the *CNT* households (321% increase). Migrant households spend actively on religious and other social events; the average increase is particularly large for the *NEW* and *CTN* groups (252% and 254% increase, respectively). Overall, observed changes in expenditure per adult-equivalent among the migrant groups seem to lend support to my hypothesis that the *NEW* and *CNT* groups increase consumption level during the two periods, while the *POST* group shows no substantial change.

Table 5.3 also shows the indicators of investment outcome in agriculture, business and human capital among the sample household groups; my primary interest is to understand the change in investment level from 2008 to 2014. Because annual flow of investment is highly volatile and may not represent the investment behaviour of the migrant households during the entire periods under study (Böhme, 2015), I use present values of agricultural equipment and livestock as indicators of agricultural investment. The use of stock value as an indicator seems reasonable for livestock, since livestock is a perishable asset and needs replacement every few years. My two-year panel data has a gap of several years between measurements (2008 and 2014), and it is reasonable to assume that the livestock value measured in the 2014 survey does not contain carry-over stock from 2008 survey. For measurement of the level of business investment,⁴⁰ two indicators are used: business ownership dummy (=1 if own) and present value of total business capital stock. For non-binary indicators, I use per capita values by weighting

⁴⁰ The types of business in the rural village settings of surveyed households include groceries, clothing store, tea house, and agricultural product processing (fish drying, rice mill operation etc.), among others.

the indicators with the number of working age adults (age16-50) excluding migrant workers abroad.

Descriptive data show that the *CNT* and *POST* migrant groups invest less (or more precisely, own less capital) in agricultural equipment and livestock in 2014. The *CNT* and *POST* groups also reduce investments in agriculture from 2008 to 2014. The *NEW* group, on the other hand, increases investment on agriculture in 2014.⁴¹ This is in contrast to my hypothesis that predicts decline in investment among the *NEW* group. It is not clear, however, that this increase is due to change in migration status or other factors such as household or village characteristics associated with the *NEW* group. These differences in investment remain largely the same qualitatively when I replace per worker investment value with total household investment (not shown in the table).

The patterns of change in investment outcome on business are remarkably different from those on agricultural investment. In 2014, proportion of business owners is 24% among the *BASE*, compared to 16% among the *NEW* group, 10% among the *CNT* group and 30% among the *POST* group in 2014. The likelihood of business ownership declines among the *NEW* migrant households (proportionate decline of 33%; 8% decline in value), while it increases substantially among the *POST* group (proportionate increase of 30%; 7% increase in value). Business capital stock increases by 515% among the *POST* group on average, through large variations exist. These changes seem to lender support my hypothesis. Meanwhile, the *CNT* group shows a low, unchanged rate of business ownership, and their stock of business capital in 2014 grows

⁴¹ A similar observation is made by Gibson et al. (2013), where they find that agricultural income of new migrant households actually increased in the first year of migration. They explain that migrants likely exerted more effort on agricultural production before their departure to overseas jobs.

less than those of the *BASE* group. Again, there is no substantial change when I replace per worker investment outcome value with total household investment outcome value (not shown in the table).

As indicators of human capital investment, adult equivalent health care/medical cost and school enrolment rates of children (all, boys, girls) age 12-18 are used. For education related variables, I restricted samples to those with children in the defined age group (1,556 samples). From Table 5.3, I observe that all migrant households, especially those in the *CNT* group, spend substantially more on average on health care and medical treatment than non-migrant households. The *CNT* and *POST* households experience a greater proportional increase in health related expenditure (299% and 180%) than the *BASE* group (112%). School enrolment ratios are generally higher among the *CNT* groups (0.81) than the *BASE* (0.7). The *BASE* group enrolment ratio for boys is lower than that for girls among. Improvement in school enrolment is most marked among migrant household groups.

5.4 Empirical model

To estimate the heterogeneous outcome of migration on household investment among migrant groups in different stages of migration, I use the following equation;

$$Y_{ijt} = \alpha_i + \beta_1 MIG_{it} + \beta_2 HH_{it} + \rho_{jt} + \varepsilon_{ijt}, \quad (1)$$

where Y_{ijt} is the outcome variable of my interest in household i at village j ($j=1,2,3,\dots,62$) in year t ($t=1,2$) where survey data of 2008 is $t=1$ and that of 2014 is $t=2$. Y_{ijt} includes per worker investment in agriculture and business, adult equivalent

household consumption, adult-equivalent health related expenditure, and school enrolment ratio. Except for the school enrolment ratio, I use the values in natural log. The term α_i represents household fixed effects which control for time-invariant characteristics of sample households including even unobserved factors. MIG_{it} is a vector containing interaction terms of the second period dummy T_2 (=1 if t=2) with a set of migration status dummies; NEW_i , CNT_i , and $POST_i$ taking 1 if household i is categorized into NEW , CNT , or $POST$, respectively and 0 otherwise. This specification allows the change in the dependent variable over the two periods to vary across different migration categories. The coefficients can be interpreted as the relative difference in the change in the outcome variable over the two periods between households with a given type of migration stage (NEW , CNT , or $POST$) and base households ($BASE$).⁴²

HH_{it} is a set of time-variant household characteristics in year t , and includes land assets, age of household head, education level of adults, and information on household member composition (number of working age adults and the dependency ratio of the old and young members). I used the proportion of household adult members with highest level of education completed in each of the six education levels (illiterate, primary education, up to post graduate) to represent household education level. Descriptive data indicate possible changes in the household composition of non-nuclear family members due to change in migration status. I therefore include a number of variables on household structure to account for those changes in the regression. I also include an indicator dummy for households with domestic migrants (seasonal and long-term) and

⁴² Taking the first-order time difference of Eq.(1) over the two period, I obtain that

$\Delta y_{ij} = \beta_{1,new}NEW_i + \beta_{1,cnt}CNT_i + \beta_{1,post}POST_i + \beta_2 \Delta HH_{ij} + \Delta \rho_j + \Delta \varepsilon_{ij}$, where $\Delta x_{ij} \equiv x_{ij2} - x_{ij1}$ for $x = y, HH, \rho$, or ε ; and $\beta_1 = [\beta_{1,new}, \beta_{1,cnt}, \beta_{1,post}]$. So each coefficient of the migration status dummies corresponds to the average additive change in the outcome variable over the two periods among households with each of the migration status relative to the BASE households.

for households affected by disaster in the year prior to the survey year. For estimation using school enrolment ratio, I control for children's age by including proportion of children in each age from 12 to 18.

ρ_{jt} is the time-variant village-level additive effect on the outcome variable and could be accounted for by social and economic infrastructures as well as the market conditions at village j at time t . I use two different specifications in an attempt to control for this time-variant village effect. For the first specification, I use time-variant and observable village-level indicators, which include travel time to the district town; to the nearest bank branch; and to the nearest market; a binary indicator corresponding to village access to electricity (=1 if available); village population size; number of rickshaws per village population; and the proportion of non-migrant or home-based workers employed in the non-farm sector in each village. The last variable is constructed using observations from sample households.⁴³ To account for unobserved and time-variant change specific to particular geographical location, I also used, in this first specification, a set of division dummies (Div-dum) interacted with the second period dummy T_2 .⁴⁴ This specification, however, may not be sufficient for controlling large variation in level of social and economic infrastructure as well as market conditions at village level (such as proximity to the nearest industrial zone that provides jobs and business opportunities), because each division is composed of 5 to 13 sample villages scattered across its area. It is plausible, for example, that source villages of migrants face less favourable economic infrastructure and opportunities than non-source

⁴³ This variable, representing non-farm labour participation, may be endogenous because a migrant household may receive remittances, which could help to create more non-farm jobs for the household members. To reduce this bias, I construct the variable representing village-level non-farm sector participation by subtracting own household (i).

⁴⁴ There are a total of 8 administrative divisions in Bangladesh.

villages and that the trend exacerbates over time. If the unaccounted time-variant village characteristics are simultaneously correlated to particular migrant household group status and to outcome variables such as investment, underestimation of the impact of migration on investment is likely. Therefore, I also implement the second specification, in which the time-variant village effects, ρ_{jt} , are controlled for by interaction terms of a set of village dummies (Vill-dum) with the second period dummy T_2 . The second specification is more robust against possible endogeneities of migration status variables caused by time-variant factors at the village level. It is because the interaction terms of the village dummies and the time dummy can control for all the time-variant village level factors including unobservable factors. The second specification, therefore, is my preferred model.

The coefficients of my interest are β_1 , which represents the change in the outcome variables specific to each of the migration stages compared to non-migrant households. Since the dependent variables are in natural log or a binary indicator and that explanatory variables of my interest are the binary dummies of migration in the linear model, the coefficients β_1 (to be estimated) represent a proportional change in the outcome variables.

An immediate concern that arises from this specification is the endogeneity of the migration status variables; unobserved characteristics of sample households may be correlated simultaneously to the probability of being migrant households of specific categories and to the outcome variable. They include characteristics such as diligence, ability to cope with hardship, particular levels of risk preference, and unreported household wealth. The *CNT* and *POST* groups face additional selection of continuing or

exiting from the pool of migrant households. Household fixed effects α_i in Eq. (1) controls for the influence of household level unobserved factors.

This specification does not exclude the possibility of reverse causality where migrants may decide to return after making investments at home, though it is also reasonable to assume that such investment is made as a preparation for planned return. Reverse causality may also affect new migrants; failure in business may either encourage households to choose migration as an alternative income source, or discourage it by causing a credit constraint to pay for migration cost. It is, however, very difficult to know whether a particular investment in a household is directly affecting the decision to initiate, continue or end migration from survey data (or the act thereof). Therefore, my results are best interpreted as identifying the presence of statistically significant heterogeneity in investment patterns among households in differing stages of migration, as opposed to indicating specific impact or causality of various migration treatments.⁴⁵

Meanwhile, I note that termination of migration or joining the *POST* group has an aspect of random assignment in the context of Bangladesh, where major recipient countries impose very strict temporary migration policies on foreign workers. Migrant workers must return home every two to three year at contract end. Only some migrants succeed in renewing contracts with existing employers. Frequent impositions of moratoria on the intake of Bangladeshi workers by major destination countries such as Saudi Arabia and Malaysia have posed great threats to job security (see Economist, 2013 for example). The randomness in return migration stands in contrasted to the case

⁴⁵ Another source of endogeneity is simultaneity because remittances may affect the general equilibrium of village economies, which then influences the level of household investment.

of migrants with permanent residency or high skill level who can choose to stay or return based on their needs and preferences, as modelled in the literature on return migration (Gibson and McKenzie, 2011; Dustmann and Kirchkamp, 2002).

5.5 Results

Tables 5.4 to 5.7 report the results of the linear household fixed effects regression using Eq.(1). The results on business investments are shown in Table 5.4, on agriculture in Table 5.5, on consumption in Table 5.6, and on human capital investment in Table 5.7.

The regression results on business and agricultural investments are reported in Table 5.4 and 5.5. The results of based on two different specifications to control for village characteristics are reported, one using observable village indicators + time-interacted division dummies(D-dum), and the other using time-interacted village dummies only (V-dum). The results of the first and the second specifications are generally comparable, but the overall fit of the model measured by R-squared is higher for the model with village dummies. As anticipated, the regression results of the first specification (D-dum), which does not take into account unobserved time-variant village characteristics, show smaller positive outcome and larger negative outcome of migration than those of the alternative specification (V-dum). For that reason, I report the results using village dummies. I refer to the first specification (D-dum) only when I examine the association between the outcome variables and observable village characteristics. For the remaining tables, I report regression results using village dummy specification only (Table 5.6-5.8).

The results presented in Table 5.4 suggest that there are unique patterns of business investment at each stage of migration. By initiating migration, the *NEW* households reduce the likelihood of owning business by 9.5 percentage points relative to the *BASE* group. The *POST* group, on the other hand, shows an increase in the likelihood by 8.8 percentage points. The coefficient of the *CNT* household dummy is positive but insignificant. The level of capital stock value follows the same trend as the likelihood of business ownership. The *POST* households increase total business capital stock by as much as 55%. Meanwhile, the average business capital stock of the *NEW* group drops by 39.0%. I checked the robustness of my results by replacing investment with income from business and trade activities, and find similar outcomes (not shown in the table). I also applied an alternative specification that uses outcome variables at household level (without per worker weight), and obtained very similar results. The regression outcome for business investments is highly consistent with my hypotheses.

It is also worth looking at the covariates that explain likelihood and the level of business investment other than international migration status. Those covariates include number of working age adults, high proportion of members with final education of mid-high secondary schooling, non-pursuit of domestic migration, development of nonfarm sectors in villages, and good access to market. These results are consistent with my expectations.

My results for agriculture investment (Table5) show that initiating (*NEW*) and continuing migration (*CNT*) have negative and significant impact on investment in equipment. The *NEW* and *CNT* groups experience reduction in per worker agricultural equipment value by 42.8% and 64.5%, respectively, compared to that of the *BASE*

group. On the other hand, the coefficient of the *POST* group is positive but not significant. There was no notable change in livestock investment among all migrant groups. The estimation outcome on agricultural equipment investment supports my hypothesis that new migration reduces investment, but this was not the case for the *POST* group, as they did not increase investment in agriculture.

My estimate of the change in consumption pattern is presented in Table 5.6. There is a notable rise in consumption level among the *NEW* and *CNT* groups. As for daily expenditure, the two groups experience 17.1% and 23% increase relative to the *BASE* group, respectively. Expenditures relating to religious festivals and social events increase at a greater rate (34.6% for the *NEW* group and 30.1% for the *CNT* group). Meanwhile the *POST* group presents no significant change in all consumption items. These results clearly support my hypotheses. It is interesting to note that change in expenditure for housing repair and construction is observed only among the *CNT* group (increase by 84.4%).

The estimation result for human capital investment shows that health expenditure of the *NEW* and *CNT* groups increase substantially (68% and 47.5%, respectively), while that of the *POST* group shows no significant change (Table 5.7). The levels of health expenditures among migrant groups appear to change in a manner more similar to consumption than investment. Regarding school enrolment ratio of children in age 12 to 18, the *NEW* group improves the enrolment ratio by 0.13 points on average and the impact is large among girls (0.32 point increase). No significant change is observed for the *CNT* and *POST* groups. Anecdotal evidence suggests that increased dependency on migration may discourage parents from investing in higher education,

especially for boys, since overseas jobs do not require a high level of education. This may explain why a positive and significant outcome is found for girls in the *NEW* households. The regression results on enrolment ratio do not support my general hypothesis on investment. Level of investment in education may be better interpreted as an outcome based on household's long-term plan, so that the invested amount does not vary over time even when migration status changes, except in the case of initiating migration, which may reduce liquidity constraint.

Comparison of my results to those of other specifications

I now compare my results to those from alternative specifications. Firstly, I compare my result (specification 1) to an alternative specification (specification 2) that mimics the approach of many of the existing studies that estimates an average treatment effect among all migrant households. This model assigns migrant household dummy (=1) to all types of migrant households (*NEW*, *CNT*, and *POST*) and estimate the impact using the same covariates as those in Eq.(1) with household fixed effects. In all specifications, I used village dummy specification.

My results on investment and consumption and those of average treatment effect model are presented in Table 5.8. The two specifications are expected to provide comparable results when directions of the effects are the same among all groups, as is the case for agricultural investment, health costs, and daily expenditures. However, the average treatment specification is expected to reveal little when different migrant groups experience opposing outcomes. For example, business investment outcomes (business ownership and business capital value) are negative for the *NEW* households

and positive for the *POST* households, and these outcomes cancel each other out when average outcome is estimated.

I also compare our results to those based on another type of fixed effects estimation (specification 3) which assigns migrant dummy (=1) to households which report migrant workers at the time of survey, and assigns dummy (= 0) to non-migrant households including those that have terminated migration. In the context of my data, this method will assign migrant dummies in the following way: *NEW* (=0 for 2008 and =1 for 2014), *CNT* (=1 for 2008 and =1 for 2014), and *POST* (=1 for 2008 and =0 for 2014). Unlike the specification (1) and (2), time dummy (=1 if t=2) is not interacted in the estimation, therefore, it relies on change in household migration status between survey rounds (non-migrant to migrant or *vice versa*) as the source of variations in estimation.⁴⁶ This model is employed in some studies (Böhme 2015) and it contrasts with specification (2) that estimates the outcome of all migrant households (including all-time migrant households (CNT) that do not change migration status from previous survey round). One shortcoming of this model is its assumption that starting and ending migration has a symmetric (opposing) impact on household. This assumption is questionable since households end migration only after going through migration treatment.

When comparing my results to those of specification (3), the latter can be regarded as an outcome representing changes in the *NEW* and *POST* groups with opposing signs. Specification (3) suffers from underestimation in outcomes such as agricultural equipment investments, health expenditures, daily expenditures and housing

⁴⁶ Taking the first-order time difference of Eq.(1) over the two period under this specification (3), I obtain the following relationship; $y_{ij} = \beta_1 \Delta Mig_{ij} + \beta_2 \Delta HH_{ij} + \Delta \rho_j + \Delta \varepsilon_{ij}$, where $\Delta x_{ij} \equiv x_{ij2} - x_{ij1}$ for $x = y, HH, \rho$, or ε ; and $\Delta Mig_{ij} = \Delta NEW_{ij} + \Delta CNT_{ij} + \Delta POST_{ij}$, where $\Delta NEW_{ij} = 1 - 0 = 1$; $\Delta CNT_{ij} = 1 - 1 = 0$; and $\Delta POST_{ij} = 0 - 1 = -1$.

expenditures where the *CNT* group experiences positive and significant changes. As for business related investments, the coefficients of specification (3) are negative, suggesting that migration treatment results in a reduction of business investments. It is important to note here that such a reduction masks symmetric change experienced among the *POST* households increasing business investments. It is difficult, however, to know from the results of specification (3) alone whether it is the outcome from the *NEW* or *POST* group (or both) that drives the overall results. My specification shows that the negative coefficients are the results of statistically significant changes experienced by both parties.

5.6 Conclusion

Empirical studies examining the impact of migration on household investments present mixed results, and this can be partly due to the difference in estimation methods. In this study, I identified heterogeneous outcomes of migration by introducing a unique exploratory model classifying international migrant households into three distinct categories based on their migration history and status. The estimates, using panel data set on rural households in Bangladesh, found widely differing outcomes of migration on household investment and consumption among those groups. The study found that initiating migration reduces household investment in business, while post migration households experience substantially positive increase in investment. It also found that migration contributes significantly to increased expenditures relating to health costs, and helps raise the school enrolment ratio of children especially girls, among households with relatively new experience of migration. Another interesting finding

was that initiating and continuing migration substantially increased consumption level and that the increased level of consumption persisted even after migration was terminated, as predicted by the permanent income hypothesis.

The findings of this study highlighted the merit of examining migration outcome based on varying stages of migration. They revealed several impacts experienced by differing groups of migrant households; those cannot be estimated by using single binary indicator of migration treatment or by using on-off changes in migration status of households as a source of variation. The results showed that the heterogeneous effects often cancel each other out and, consequently, no or insignificant average effects are observed when only the average effect on all migrant households is estimated. This suggests a need for reconsideration of the findings in the existing literature, where in many cases no heterogeneous effect of migration is taken into account.

CHAPTER 6

Conclusions and Policy Recommendations

In this thesis, I provided empirical evidence towards a better understanding of the relationship between international migration and development through the examination of the migrant households in Bangladesh. In the first analysis (Chapter 4), I examined the beneficiaries of international migration by identifying characteristics associated with migrant households and determined whether international migration is becoming an accessible option for households with a wide range of wealth and other endowments. The analysis showed that household education and asset levels are important determinants of international migration, particularly in the early years of migration. It is also found that, in recent times, less educated and less wealthy households are taking part in migration, albeit slowly. In addition, social network facilitating migration within community is a key contributor to migration, but its predictive power of migrant household declines over time. These findings suggest that barriers to entering into international migration, resulting from paucity of financial, human and social capital endowment, have decreased over time. Further analysis suggests that possible causes for such changes include persistent demand for low-skilled workers in major destination countries, growing domestic labour market (in Bangladesh) favouring educated workers, and improved access to non-collateral loans and grants to finance migration.

This analysis demonstrated the value of examining the determinants of migration using the example of migration routes, which is seldom studied for the purpose. The results shows that international migration is becoming more accessible to the poor, but migration network seem to play limited role in rendering the outcome:

when predominant form of migration is temporary, migration network does not seem to exert large influence as it does in the case of migration in America as shown by the exiting literature.

In the second analysis of the thesis (Chapter 5), I examined the outcome of migration on household investment in physical and human capital. I paid close attention to the heterogeneity in the forms of migration by classifying migrant households into three distinct groups (new, continuing and post migration households) and evaluated the outcome of migration specific to each group. The results point to varying outcomes of migration on household investment and consumption among those groups. Initiating migration reduces household investment in business, while terminating migration is associated with substantially positive increase in business investment. I also found that migration contributes to increasing health care expenditures, and helps improve school enrolment ratio of children, especially for girls among households with relatively new experience of migration. Another interesting finding was that initiating and continuing migration substantially increase household consumption level and that the increased level of consumption remains even after migration is terminated, as predicted by the permanent income hypothesis.

The results of this study highlighted the merit of examining migration outcome based on varying stages of migration, uncovering multiple outcome experienced by differing groups of migrant households. These outcomes cannot be identified when using single binary indicator of migration treatment or on-off changes in migration status of households as a source of variation. Such heterogeneous effects often cancel each other out and, consequently, no or insignificant average effects are observed when

only the average effect of all migrant households is estimated. This finding suggests a need for reconsideration of the findings in many previous studies in which no heterogeneous effect of migration is taken into account.

The findings of the analysis in this thesis carry important policy implications. The government of Bangladesh has been active in making overseas jobs available to a greater number of households, especially among the poor (see Chapter 1 for more detail on the government policy). The results of my first analysis provide evidence that the landscape of international migration in the country is changing in favour of the poor due to the changes observed in the demand for labours at destination and in the socio-economic environment of Bangladesh. However, the new migrant households are likely in debt and repaying loans they have taken to pay for migration cost. The government would be well advised to continue supporting new and potential migrant families by promoting the provision of non-collateral and low-interest loans for migration. In addition, the present study finds that recruitment agents play an increasingly important role in facilitating international migration for households inexperienced with migration. The government may wish to work collaboratively with trustworthy agents while at the same time strengthening measures to protect migrants from fraud and abuse as increasing number of less educated households participate in overseas employment.

The findings from the second analysis provide important policy implications for the governments of Bangladesh, which is looking for ways to promote productive use of remittances. My results suggest that migrant households are not likely to increase business investment in the initial period but only after working abroad for some years. Governments may wish to promote productive use of remittances by creating environments conducive to lucrative investments. In fact, my findings suggest that

migrant households in rural Bangladesh preferred to invest in business rather than agriculture, and that the level of business investment is highly correlated with favourable market infrastructure such as better access to market and financial services, availability of electricity, and the presence of active non-farm employment and business opportunities. Therefore, the government is encouraged to improve economic infrastructure and create a favourable business environment in order to stimulate migrants to invest at home.

Our analysis also showed that school enrolment ratio of school-age girls in households that initiated migration improved while that of boys did not show any significant change. As Bangladeshi economy is expected to require more skilled labour in coming years, it would be undesirable if international migration does not contribute to education among boys. The government is advised to look into this issue and to promote investment in education especially for boys in general and among migrant households in particular.

References

- Abella, M., and Martin, P. (2015) Measuring and reducing migration costs; presentation prepared for the International Conference Harnessing Migration, Remittances and Diaspora, New York, May. 26-27 [PowerPoint slides]. Retrieved from www.globalmigrationgroup.org/sites/.../Abella_%26_Martin_for_NY_May%20_7.pptx+&cd=1&hl=en&ct=clnk&gl=jp (last visited April 1, 2016).
- Abramitzky, R., Boustan, L. P., and Eriksson K. (2013) Have the poor always been less likely to migrate? Evidence from inheritance practices during the age of mass migration, *Journal of Development Economics*, 102: 2-14.
- Acosta, P. (2011) School attendance, child labour, and remittances from international migration in El Salvador, *Journal of Development Studies*, 47(6): 913-936.
- Adams, R. (2006) International Remittances and the Household: Analysis and Review of Global Evidence, *Journal of African Economies*, 15 (2): 396-425.
- Ahmad, A., and Haque, I. (2011) Economic and Social Analysis of Primary Education in Bangladesh: A Study of BRAC Interventions and Mainstream Schools, Research Monograph Series No. 48, Research and Evaluation Division, BRAC.
- Amuedo-Dorantes, C., and Pozo, S. (2006) Remittances as insurance: evidence from Mexican immigrants, *Journal of Population Economics*, 19 (2): 227-254.
- Ang, A.P., Sugiyarto, G., and Jha, S. (2009) Remittance and Household Behavior in the Philippines, *ADB Economic Working Paper Series*, No. 188.
- Antman, F. M. (2011). The intergenerational effects of paternal migration on schooling and work: What can we learn from children's time allocations? *Journal of*

- Development Economics*, 96(2):200–208.
- Ashraf, N., Aycinena, D., Martinez C. A., and Yang, D. (2015) Savings in Transnational Households: A Field Experiment among Migrants from El Salvador, *The Review of Economics and Statistics*, 97(2): 332–351
- Azam, J., and Gubert, F. (2006) Migrant' Remittance and the Household in Africa: Review of Evidence, *Journal of African Economies*, 15(AERC Supplement 2): 426-462.
- Bellemare, F. M., Masaki, T., and Pepinsky, T. B. (2015) Lagged Explanatory Variables and the Estimation of Causal Effects, Available at SSRN: <https://ssrn.com/abstract=2568724>
- Böhme, M. (2015) Does migration raise agricultural investment? An empirical analysis for rural Mexico, *Agricultural Economics*, 46(2): 211-225.
- Bryan, G., Chowdhury S., and Mobarak, M.A. (2014) Underinvestment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh, *Econometrica*, 82(5): 1671-1748.
- Bureau of Manpower Employment and Training, Bangladesh (BMET). (2016) Overseas Employment Statistics, retrieved from <http://www.bmet.org.bd/BMET/statisticalDataAction> (last visited November 10, 2016)
- Calero, C., Bedi, A. S., and Sparrow, R. (2009) Remittances, Liquidity Constraints and Human Capital Investments in Ecuador, *World Development*, 37(6): 1143–1154.
- Clemens, M., and Ogden, T. (2014) Migration as a Strategy for Household Finance: A Research Agenda on Remittances, Payments, and Development, *Center for*

Global Development Working Paper, No. 354.

de Haas, H. (2010a) Migration and development: a theoretical perspective. *International Migration Review*, 44(1): 227–264.

de Haas, H. (2010b) The internal dynamics of migration processes: a theoretical inquiry, *Journal of Ethnic and Migration Studies*, 36(10): 1587-1617.

Démurger, S., and Xu, H. (2011) Return Migrants: The Rise of New Entrepreneurs in Rural China, *World Development*, 39(10): 1847–1861.

Doi, Y., McKenzie D., and Ziaa, B. (2014) Who you train matters: Identifying combined effects of financial education on migrant households, *Journal of Development Economics*, 109: 39–55.

Dustmann, C., and Kirchkamp O. (2002) The optimal migration duration and activity choice after re-migration, *Journal of Development Economics*, 67(2): 351–372.

Economist. (2013) “Bangladesh and Saudi Arabia; revenge of the migrants' employer?” An article published online on Mar 26th 2013.

<http://www.economist.com/blogs/banyan/2013/03/bangladesh-and-saudi-arabia>

Estudillo, J., and Otsuka. K. (2016) *Moving Out of Poverty: An Inquiry into the Inclusive Growth in Asia*. London: Routledge.

Estudillo, J., Sawada, Y., and Otsuka, K. (2006) The Green Revolution, Development of Labor Markets, and Poverty Reduction in Rural Philippines, 1985- 2004, *Agricultural Economics*, 35(Supplement): 399-407.

Funkhouser, E. (2013) “Using longitudinal data to study migration and remittances,” in Vargas-Silva, C. (Ed), *Handbook of Research Methods in Migration*, London: Edward Elgar Publishing.

- Gibson, J., McKenzie, D., and Stillman, S. (2013) Accounting for Selectivity and Duration-Dependent Heterogeneity When Estimating the Impact of Emigration on Incomes and Poverty in Sending Areas, *Economic Development and Cultural Change*, 61(2): 247-280.
- Government of the People's Republic of Bangladesh. (2015) SEVENTH FIVE YEAR PLAN FY2016 – FY2020: Accelerating Growth, Empowering Citizens, retrieved from http://www.plancomm.gov.bd/wp-content/uploads/2015/10/7FYP-Final-Draft_13_10_15.pdf (last visited November 29, 2016)
- Gubert, F. (2002) Do migrants insure those who stay behind? evidence from the Kayes area (Western Mali), *Oxford Development Studies*, 30(3): 267-287.
- Hossain, M., Rahman, M., and Estudillo, J. P.(2009). Poverty Dynamics in Rural Bangladesh, in Otsuka, K., Estudillo, J. P., and Sawada, Y. (Eds.), *Rural Poverty and Income Dynamics in Asia and Africa* (94-117), London: Routledge.
- International Labour Organization. (2014) *The Cost: Causes of and potential redress for high recruitment and migration costs in Bangladesh*, ILO Country Office for Bangladesh.
- International Monetary Fund. (2013) *Bangladesh: Poverty Reduction Strategy Paper*. Country Report No. 13/63, IMF Publication Services, Washington, D.C.
- International Organization for Migration. (2009) *Summary Report of Bangladesh Household Remittance Survey 2009*. Dhaka Bangladesh: IOM Dhaka.

- Jaim, W. M. H., and Hossain M. (2011) Women's Participation in Agriculture in Bangladesh 1988-2008: Changes and Determinants, a paper presented at the 7th Asian Society of Agricultural Economists (ASAE) International Conference, Hanoi, Vietnam, October, 12.
- Kurosaki, T., & Khan, H. (2006) Human Capital, Productivity, and Stratification in Rural Pakistan, *Review of Development Economics*, 10(1):116–134.
- Lall, V. S., Harris, S., and Zmarak Z. (2006). Rural-Urban Migration in Developing Countries: A Survey of Theoretical Predictions and Empirical Findings, *World Bank Policy Research Working Paper*, No 3.915.
- Mansuri, G. (2006) Migration, School Attainment and Child Labor: Evidence from Rural Pakistan, *World Bank Policy Research Working Paper*, No. 3945.
- Massey, D. (1990) Social structure, household strategy, and the cumulative causation of migration, *Population Index*, 6 (1): 3-26.
- Matsumoto, T., Kijima, Y., & Yamano, T. (2006) The role of local nonfarm activities and migration in reducing poverty: evidence from Ethiopia, Kenya and Uganda, *Agricultural Economics*, 35 (Supplement 3): 449-458.
- McKenzie, D., and Rapoport, H. (2011) Can migration reduce educational attainment? Evidence from Mexico, *Journal of Population Economics*, 24(4): 1331–1358.
- McKenzie, D., and Rapoport, H. (2010) Self-selection patterns in Mexico-U.S. migration: the role of migration network, *The Review of Economics and Statistics*, 92(4):811-821.

- McKenzie, D., and Rapoport, H. (2007) Network effect and the dynamics of migration and inequality: theories and evidence from Mexico, *Journal of Development Economics*, 84:1-24.
- McKenzie, D., Stillman S., and Gibson, J. (2010) How Important is Selection Experimental Vs Non-experimental Measures of the Income Gain from Migration, *Journal of the European Economic Association*, 8(4): 913–945.
- McKenzie D. and Yang, D. (2010) Experimental Approaches in Migration Studies, *World Bank Policy Research Working Paper*, No. 5395.
- Mendola, M.(2008) Migration and technological change in rural households: complements or substitute? , *Journal of Development Economics*, 85: 150-175.
- Nargis, N., and Hossain, M. (2006) Income dynamics and pathways out of rural poverty in Bangladesh, 1988 – 2004, *Agricultural Economics*, 35(Supplement 3): 425-435.
- Organization for Economic Cooperation and Development. (2016) OECD Stat, retrieved from <http://stats.oecd.org/Index.aspx?ThemeTreeId=3>
- Organization for Economic Cooperation and Development. (no date) “ What are equivalent scale?” retrieved from <https://www.oecd.org/eco/growth/OECD-Note-EquivalenceScales.pdf>
- Organization for Security and Co-operation in Europe, International Organization for Migration, & International Labour Office. (2006) *Handbook on Establishing Effective Labour Migration; Policies in Countries of Origin and of Destination*, Vienna: OSCE publication.

- Pernia, E. M. (2008) Migration, Remittances, Poverty and Inequality: The Philippines, *The University of the Philippines School of Economics Discussion Papers*, No. 0801.
- Piracha, M., and Vadean, F. (2010) Return Migration and Occupational Choice: Evidence from Albania, *World Development*, 38 (8): 1141–1155.
- Portes, A. (1979) Illegal immigration and the international system: lessons from recent legal immigration from Mexico, *Social Problem*, 26: 425-438.
- Quisumbing, A., and McNiven, S. (2010). Moving forward, looking back: the impact of migration and remittances on assets, consumption and credit constraints in the rural Philippines, *Journal of Development Studies*, 46(1): 91-113.
- Rahman, Z. H. and Hossain M. (1995) Study Coverage and Methodology. In Mahabub Hossain, Binayak Sen and Hossain Zillur Rahman (Eds), *Rethinking Rural Poverty: Bangladesh as a case study* (28-38). New Delhi: Sage Publication.
- Raihan, S., Sugiyarto, G., Bazlul H. K., and Jha, S. (2009) Remittances and Household Welfare: A Case Study of Bangladesh, *ADB Economics Working Paper Series*, No. 189.
- Rashid, S., Tefera, N., Lemma, S. , and Yunus, M. (2014) Population Pressure and Livelihood Dynamics: Panel Evidence from Bangladesh, *International Food Policy Research Institute (IFPRI) Discussion Paper*, No. 01326.
- Ribas, N. (2008) *Gender, Remittances and Local Rural Development: The Case of Filipino Migration to Italy*, United Nations International Research and Training Institute for the Advancement of Women (INSTRAW).
- Rozelle, S., Taylor E.J., and deBrauw, A.(1999) Migration, Remittances, and

- Agricultural Productivity in China, *American Economic Review*, 89(2): 287-291.
- Seshan, G., and Yang, D. (2014) Motivating migrants: A field experiment on financial decision-making in transnational households, *Journal of Development Economics*, 108: 119–127.
- Sharma, M., and Zaman, H. (2013) Who migrates and is it worth their while? An assessment of household survey data from Bangladesh, *Journal of Developing Areas*, 47(1): 281-302.
- Stark, O., and Bloom, D. E. (1985) The New Economics of Labor Migration, *American Economic Review*, 75(2): 173-178.
- Stark, O., and Lucas, R. (1988) Migration, remittances, and the family, *Economic Development and Cultural Change*, 36 (3): 465-481.
- Stark, O., Taylor E. J., and Yitzhaki, S. (1986) Remittances and inequality, *Economic Journal*, 96(383): 722-740.
- Taylor, E. J. (1999) The New Economics of Labour Migration and the Role of Remittances in the Migration Process, *International Migration*, 37(1): 63–88.
- Taylor, E. J., and Lopez-Feldman A. (2009) Does Migration Make Rural Households More Productive? Evidence from Mexico, *The Journal of Development Studies*.46(1): 68-90.
- United Nations. (2016) “*International Migration Stock 2015 Revision*”, retrieved from <http://www.un.org/en/development/desa/population/migration/data/estimates2/estimates15.shtml> (last visited December 5, 2016).
- United Nations Development Program. (2016) Human Development Report Website <http://hdr.undp.org/en/content/mean-years-schooling-adults-years> (last visited

March 15, 2016).

Edwards, A., C., and Ureta M. (2003) International migration, remittances, and schooling: evidence from El Salvador, *Journal of Development Economics*, 72(2):429–461.

VanWey, K. L. (2005) Land Ownership as a Determinant of International and Internal Migration in Mexico and Internal Migration in Thailand, *The International Migration Review*, 39(1): 141-172.

Wooldridge, Jeff (2010) "Econometric Analysis of Cross Section and Panel Data," Second edition, MIT Press.

World Bank. (2016) *Migration and Remittances Fact Book 2016*, retrieved from <http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1199807908806/4549025-1450455807487/Factbookpart1.pdf> (last visited December 5, 2016).

World Bank Development Indicator (2016) Website <http://data.worldbank.org/data-catalog/world-development-indicators> (last visited March 15, 2016)

Yang, D. (2011) Migrant remittances, *Journal of Economic Perspective*, 25(3):129-152.

Yang, D. (2008) International Migration, Remittances and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shock, *Economic Journal*, 118: 591-630.

Yang, D., and Choi, H. (2007) Are remittances insurance? Evidence from rainfall shocks in the Philippines, *World Bank Economic Review*, 21(2): 219-248.

Zhang, X., Rashid, S., Ahmad, K., Mueller, V., Lee, L.H., Lemma, S., Belal, S., and Ahmed, A. (2013) Rising Wages in Bangladesh, *International Food Policy Research Institute (IFPRI) Discussion Paper*, No. 01249.

Tables

Table 3.1 Descriptive Statistics of Sample Households by Attrition Status (2000)

	ALL HH (n=2492) (1)	Attrition HH (n=362) (2)	Non Attrition HH (n=2130) (3)	T-test (2)-(3) (4)
<i>Household Characteristics</i>				
Age of hh head	46.77	47.69	46.61	1.079
Average years of educations among adults >18 in household	3.26	3.12	3.28	-0.153
Owned land of hh (ha)	0.60	0.53	0.62	-0.082
Non-land Asset in value (Taka)	9,794	11,469	9,509	1,960
Total number of adults (working age 16-50)	2.54	2.20	2.60	-0.400***
No. of member above 50/total workers	0.59	0.62	0.58	0.035
No. of children under 5/total workers	0.49	0.44	0.50	-0.059
=1 if hh has access to electricity	0.46	0.45	0.46	-0.014
<i>Migration Status</i>				
=1 if foreign migrant household	0.09	0.10	0.09	0.005
=1 if in-district migrant household	0.05	0.04	0.05	-0.010
=1 if out-district migrant household	0.14	0.14	0.14	0.006
<i>Village Characteristics</i>				
Travel time to district town (hour)	1.05	1.07	1.05	0.017
Travel distance to Dhaka km * 1/100 (time invariant)	2.06	2.01	2.06	-0.053
Travel time to bank (hour)	0.43	0.50	0.42	0.071**
Proportion of home-based workers in non-farm sector excl own	0.42	0.45	0.42	0.032*
=1 if hh or village with major flood damage in the survey year	0.09	0.08	0.10	-0.014
=1 if division==Barisal	0.07	0.09	0.07	0.021
=1 if division==Chittagong	0.15	0.15	0.15	0.000
=1 if division==Dhaka	0.20	0.23	0.20	0.035
=1 if division==Khulna	0.16	0.10	0.17	-0.065***
=1 if division==mymensign	0.10	0.11	0.09	0.018
=1 if division==Rajshahi	0.10	0.10	0.10	-0.007
=1 if division==Rangpur	0.13	0.11	0.13	0.018
=1 if division==Sylhet	0.08	0.09	0.08	-0.021

Notes: Attritioned HH=households that went missing after 2000 to 2014 survey rounds
village clustered errors in parentheses

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

Table 3.2 Determinants of Attrition using Information of Base Year (2000)

	Attrition HH (=1)
<i>Household Characteristics</i>	
Age of hh head	0.001 (0.001)
Average years of educations among adults >18 in household	0.000 (0.003)
Owned land of hh (ha)	-0.002 (0.011)
Non-land Asset in value (Taka)	0.000 (0.000)
Total number of adults (working age 16-50)	-0.031*** (0.008)
No. of members above 50/total workers	-0.016 (0.017)
No. of children under 5/total workers	-0.015 (0.012)
=1 if hh has access to electricity	0.006 (0.022)
<i>Migration Status</i>	
=1 if foreign migrant household	0.008 (0.029)
=1 if in-district migrant household	-0.018 (0.030)
=1 if out-district migrant household	-0.007 (0.025)
<i>Village Characteristics</i>	
Travel time to district town (hour)	-0.008 (0.012)
Travel distance to Dhaka km * 1/100 (time invariant)	-0.003 (0.010)
Travel time to bank (hour)	0.085*** (0.028)
Proportion of home-based workers in non-farm sector excl ow	0.163*** (0.051)
=1 if hh or village with major flood damage in the survey year	-0.037* (0.022)
=1 if division==Barisal	-0.005 (0.047)
=1 if division==Chittagong	-0.028 (0.036)
=1 if division==Dhaka	0.004 (0.037)
=1 if division==Khulna	-0.056 (0.035)
=1 if division==mymensign	0.008 (0.035)
=1 if division==Rajshahi	-0.016 (0.037)
	0.018 (0.037)
Observations	2,492

Notes: Attritioned HH=households that went missing after 2000 to 2014 survey rounds

Reporting marginal effects evaluated at mean value

Village clustered errors in parentheses

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

Base division=Rangpur

Table 4.1 Characteristics of Sample Households by Migration Status in 2000, 2008 and 2014

	2000			2008			2014			Equality of means		
	All (1)	Non Migrant (2)	Migrant (3)	All (4)	Non Migrant (5)	Migrant (6)	All (7)	Non Migrant (8)	Migrant (9)	(3) - (2)	(6) - (5)	(9) - (8)
<i>Household characteristics</i>												
Household size including migrants	5.6	5.4	8.3	5.6	5.4	7.4	5.0	4.7	6.5	2.9***	2.0***	1.8***
No. of adult members (working age 16-50)	2.3	2.3	2.7	2.8	2.6	3.9	2.5	2.3	3.5	0.4**	1.2***	1.2***
Average years of education among adults	3.3	3.3	3.5	4.4	4.2	5.9	4.1	4.2	3.6	0.2	1.7***	-0.6***
Owned land of hh (ha)	0.5	0.5	0.9	0.5	0.5	0.6	0.4	0.4	0.5	0.4***	0.2**	0.1**
Non-land asset (in 1,000 Bangladesh Taka)	7.5	6.0	25.9	6.7	6.5	8.4	15.3	14.4	21.0	19.9*	1.9	6.6
No. of old members over 50 / total no. of workers in households	0.6	0.5	1.0	0.5	0.5	0.5	0.5	0.5	0.6	0.5***	0.0	0.0
No. of children under 5 / total no. of workers in households	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	-0.1***	-0.1**	-0.1**
=1 if hh has access to electricity	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.9	0.1	0.0	0.2***
<i>Village characteristics</i>												
Travel time to district town (hour)	1.0	1.1	0.7	0.7	0.7	0.5	0.6	0.6	0.5	-0.4***	-0.2***	-0.1
Distance to Dhaka (100 km)	2.0	2.1	1.5	2.0	2.1	1.5	2.0	2.1	1.6	-0.6***	-0.6***	-0.5***
Travel time to the nearest bank (hour)	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	-0.1	-0.1*	0.0
Proportion of home-based workers in non-farm sector excl own	0.43	0.42	0.49	0.43	0.43	0.47	0.46	0.45	0.49	0.07*	0.04	0.03
=1 if hh or village with major flood damage in the survey year	0.09	0.10	0.03	0.19	0.18	0.26	0.01	0.01	0.01	-0.06***	0.08	0.00
<i>Migration Networks</i>												
No. of international migrants / total no. of workers (village)	0.05	0.05	0.16	0.09	0.07	0.23	0.11	0.08	0.25	0.12***	0.16***	0.17***
No. of domestic migrants / total no. of workers (village)	0.13	0.13	0.13	0.15	0.16	0.12	0.20	0.20	0.14	-0.00	-0.03*	-0.06***
Observations	1882	1737	145	2010	1779	231	2846	2461	385			
			(8%)			(11%)			(14%)			

Notes; *** p<0.01, ** p<0.05, * p<0.1

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 4.2 Characteristics of International Migrant Workers in 2000, 2008 and 2014

	2000 (1)	2008 (2)	2014 (3)
Age		30.4	32.5
Years of education	7.72	7.76	7.44
Yearly remittances (in 1,000 Bangladesh Taka)	122	141	132
Months away (cumulative)	50	65	91
Initial migration cost (in 1,000 Bangladesh Taka)	227	248	219
Job facilitated by agent (=1)	n.a.	0.34	0.40
Job facilitated by family members (=1)	n.a.	0.25	0.16
Job facilitated by friends and relatives (=1)	n.a.	0.36	0.42
Observations	185	330	497

Notes; Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)
"n.a." means not available.

Table 4.3 Destination Countries of Migrant Workers in 2014

Destination Countries	Freq.	%
Saudi Arabia	128	26%
United Arab Emirates	101	20%
Malaysia	63	13%
Oman	50	10%
Kuwait	26	5%
Qatar	24	5%
Singapore	17	3%
Bahrain	10	2%
India	5	1%
Europe	32	6%
North America	8	2%
Others/unknown	33	7%
Total	497	100%

Table 4.4 Factors Associated with the Characteristics of International Migrant Households in 2000, 2008 and 2014 (OLS)

	Migrant HH (=1)			New Migrant HH (=1)		
	2000 n=145 (1)	2008 n=231 (2)	2014 n=385 (3)	2000 n=127 (4)	2008 n=83 (5)	2014 n=76 (6)
	OLS			OLS		
<i>Household characteristics</i>						
Proportion of workers with primary education level (1-5)	0.002 (0.013)	0.006 (0.016)	0.032** (0.014)	0.006 (0.013)	-0.003 (0.011)	-0.004 (0.009)
Proportion of workers with Jr.secondary education level (6-8)	0.031 (0.021)	0.064*** (0.024)	0.084*** (0.021)	0.045** (0.021)	0.039** (0.019)	0.005 (0.013)
Proportion of workers with mid-high secondary education level (9-12)	0.084*** (0.022)	0.095*** (0.022)	0.089*** (0.019)	0.081*** (0.022)	0.040** (0.018)	0.002 (0.011)
Proportion of workers with tertiary education level (13-15)	-0.060 (0.039)	-0.033 (0.035)	-0.012 (0.037)	-0.075** (0.032)	-0.027 (0.019)	0.019 (0.024)
Proportion of workers with master/Ph.D. level (>15)	0.032 (0.104)	-0.111 (0.090)	0.004 (0.053)	0.242* (0.144)	-0.060 (0.052)	-0.019 (0.021)
Land size (h.a. in log)	0.012*** (0.004)	0.016*** (0.004)	0.007* (0.004)	0.008* (0.004)	0.004 (0.003)	-0.002 (0.002)
Non-land asset value of the hh (in 100,000 Bangladesh Taka)	0.001* (0.000)	-0.000 (0.000)	-0.000** (0.000)	0.000 (0.000)	0.001 (0.000)	-0.000* (0.000)
Total number of adults (working age 16-50)	0.008 (0.007)	0.031*** (0.006)	0.053*** (0.005)	-0.001 (0.006)	0.011** (0.004)	0.007*** (0.003)
No. of member above 50/total workers	0.056*** (0.011)	0.004 (0.012)	0.020* (0.011)	0.047*** (0.011)	-0.006 (0.008)	0.004 (0.005)
No. of children under 5/total workers	-0.003 (0.008)	-0.008 (0.010)	-0.030*** (0.009)	-0.002 (0.008)	-0.015** (0.007)	-0.004 (0.005)
=1 if hh has access to electricity	0.037** (0.016)	-0.005 (0.017)	0.004 (0.012)	0.035** (0.015)	-0.000 (0.013)	-0.013 (0.009)
=1 if hh or village with major flood damage in the survey year	-0.040** (0.016)	0.011 (0.020)	-0.031 (0.061)	-0.030* (0.016)	0.032* (0.017)	0.015 (0.042)
<i>Village characteristics</i>						
Travel time to district town (hour)	-0.041*** (0.010)	-0.074*** (0.016)	-0.065*** (0.016)	-0.037*** (0.010)	-0.050*** (0.012)	-0.009 (0.011)
Travel distance to Dhaka km * 1/100	-0.043*** (0.010)	-0.007 (0.012)	-0.005 (0.010)	-0.036*** (0.010)	-0.005 (0.007)	0.008 (0.006)
Travel time to bank (hour)	-0.049*** (0.018)	0.007 (0.025)	0.060** (0.025)	-0.037** (0.018)	0.010 (0.017)	0.017 (0.019)
Proportion of home-based workers in non-farm sector excl own	-0.037 (0.045)	-0.042 (0.044)	-0.098*** (0.037)	-0.029 (0.045)	-0.040 (0.035)	0.005 (0.021)
<i>Migration network</i>						
Lagged international migration network in village	0.864*** (0.230)	1.536*** (0.174)	0.992*** (0.106)	0.770*** (0.214)	0.458** (0.216)	0.079 (0.055)
Lagged domestic migration network in village	0.015 (0.104)	-0.168* (0.095)	-0.038 (0.075)	0.048 (0.101)	-0.022 (0.074)	-0.043 (0.049)
Division dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.166*** (0.046)	0.036 (0.053)	-0.064 (0.048)	0.143*** (0.045)	0.038 (0.039)	-0.029 (0.031)
Observations	1,741	1,947	2,768	1,693	1,769	2,487
R-squared	0.183	0.253	0.257	0.165	0.070	0.024

Notes: OLS regression using observations of respective year

Dependent variables =1 for migrant households or new migrant households in the survey year

New migrant hh = starting first migration within 4 years including the survey year

For regression (4)-(6), past and on-going migrant households are removed from control group

Numbers in parenthesis are robust standard errors

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

Base education = no education /illiterate

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 4.5 Factors Associated with the Characteristics of International Migrant Households in 2000, 2008 and 2014 (Household Fixed-Effects)

<i>Household characteristics</i>	
Proportion of workers with primary education level (1-5)	-0.000 (0.018)
Proportion of workers with primary education level (1-5) *2008	0.008 (0.021)
Proportion of workers with primary education level (1-5) *2014	0.041* (0.023)
Proportion of workers with Jr.secondary education level (6-8)	0.006 (0.027)
Proportion of workers with Jr.secondary education level (6-8)*2008	0.073** (0.029)
Proportion of workers with Jr.secondary education level (6-8)*2014	0.069** (0.032)
Proportion of workers with mid-high secondary education level (9-12)	0.111*** (0.029)
Proportion of workers with mid-high secondary education level (9-12) *2008	-0.010 (0.026)
Proportion of workers with mid-high secondary education level (9-12) *2014	-0.011 (0.030)
Proportion of workers with tertiary education level (13-15)	-0.022 (0.057)
Proportion of workers with tertiary education level (13-15)*2008	0.048 (0.041)
Proportion of workers with tertiary education level (13-15)*2014	0.057 (0.055)
Proportion of workers with master/Ph.D. level (>15)	-0.074 (0.171)
Proportion of workers with master/Ph.D. level (>15)*2008	0.025 (0.177)
Proportion of workers with master/Ph.D. level (>15)*2014	0.073 (0.177)
Land size (h.a. in log)	0.006 (0.006)
Land size (h.a. in log)*2008	0.003 (0.005)
Land size (h.a. in log)*2014	-0.013** (0.006)
Non-land asset value of the hh (in 100,000 Bangladesh Taka)	0.001*** (0.000)
Non-land asset value of the hh (in 100,000 Bangladesh Taka)*2008	-0.001*** (0.000)
Non-land asset value of the hh (in 100,000 Bangladesh Taka)*2014	-0.001*** (0.000)
<i>Migration network</i>	
Lagged international migration network in village	0.308 (0.233)
Lagged international migration network in village*2008	-0.212 (0.288)
Lagged international migration network in village*2014	-0.509** (0.258)
Constant	-0.115*** (0.044)
Observations	6,182
Number of households	2,138
R-squared	0.098

Notes; Pooled panel fixed effect regression using balanced panel data of 2000 and 2008, 2014.

Dependent variables =1 for migrant households , Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1, Base education = no education /illiterate, Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI) Other control variables included in the regression are: total number of adults (working age 16-50), no. of member above 50/total workers, no. of children under 5/total workers, access to electricity (=1), disaster damage(=1) in the survey year,travel time to district town and nearest bank (hour), proportion of home-based workers in non-farm sector excl own, and lagged domestic migration network in village, division*year dummies and year dummies.

Table 4.6 Determinants of Destination Regions of International Migrant Households in 2014

	Middle East n=312 (1)	Asia n=80 (2)	North A. & Europe n=24 (3)
	mlogit		
<i>Household characteristics</i>			
Proportion of workers with primary education level (1-5)	0.036** (0.015)	0.011 (0.011)	-0.001 (0.002)
Proportion of workers with Jr.secondary education level (6-8)	0.053*** (0.018)	0.033** (0.015)	0.003 (0.003)
Proportion of workers with mid-high secondary education level (9-12)	0.049** (0.021)	0.023** (0.011)	0.009*** (0.003)
Proportion of workers with tertiary education level (13-15)	-0.063 (0.047)	0.021 (0.022)	0.022*** (0.007)
Proportion of workers with master/Ph.D. level (>15)	0.026 (0.028)	-0.110* (0.064)	0.027*** (0.010)
Land size (h.a. in log)	0.006 (0.005)	0.003 (0.002)	0.002 (0.002)
Non-land asset value of the hh (Tk 100,000)	-0.006 (0.004)	-0.001 (0.001)	0.001*** (0.000)
Total number of adults (working age 16-50)	0.023*** (0.004)	0.009*** (0.002)	0.002** (0.001)
No. of member above 50/total workers	0.005 (0.012)	0.010** (0.005)	0.001 (0.002)
No. of children under 5/total workers	-0.003 (0.007)	-0.010 (0.007)	-0.006* (0.003)
=1 if hh has access to electricity	-0.016 (0.016)	-0.003 (0.013)	0.104*** (0.024)
<i>Village characteristics</i>			
Travel time to district town (hour)	-0.095*** (0.036)	0.014 (0.017)	-0.031 (0.022)
Travel distance to Dhaka km * 1/100	-0.002 (0.012)	-0.006 (0.006)	0.004 (0.003)
Travel time to bank (hour)	0.100*** (0.026)	0.004 (0.017)	-0.065 (0.041)
Proportion of home-based workers in non-farm sector excl own	-0.008 (0.045)	0.020 (0.014)	-0.101*** (0.022)
=1 if hh or village with major flood damage in the survey year	-0.058 (0.062)	0.029 (0.024)	-0.019 (0.017)
<i>Migration network</i>			
Lagged international migration network in village	0.390*** (0.101)	0.110** (0.044)	0.098*** (0.030)
Lagged domestic migration network in village	-0.107 (0.084)	-0.023 (0.044)	0.142*** (0.044)
Division dummies	Yes	Yes	Yes
Observations		2,768	

Notes; Multinomial logit analysis using all household observations in 2014 data

Dependent Variable =1 if household has migrant(s) in the destination

Reporting marginal effects evaluated at mean values of each category

Numbers in parenthesis are standard errors

Standard errors are clustered by village

Base category = non migrant hh n=2352

Base education = no education /illiterate

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

26 households have migrants in multiple destinations - for these, a destination with longer duration of stay in the past 5 years is assigned

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 4.7 Determinants of Monthly Salary (log) of In-district Migrants, Out-district Migrants, and International Migrants in 2014

	In-district migrant		Out-district migrant		International migrant	
	n=100 (1)	heckman	n=857 (2)	heckman	n=484 (3)	heckman
<i>Migrant's characteristics</i>						
Age	0.130*** (0.030)		0.019*** (0.003)		-0.006 (0.015)	
Age_sq	-0.002*** (0.000)		-0.000*** (0.000)		0.000 (0.000)	
=1 if male	0.054 (0.193)		0.296*** (0.053)		-0.181 (0.194)	
Primary schooling level (1-5) (=1)	0.102 (0.210)		0.115** (0.046)		-0.081 (0.090)	
Junior secondary schooling (6-8) (=1)	-0.349 (0.230)		0.150*** (0.054)		-0.094 (0.096)	
Mid-higher secondary schooling (9-12) (=1)	0.033 (0.221)		0.181*** (0.057)		0.038 (0.094)	
Tertiary schooling (13-15) (=1)	0.095 (0.318)		0.302*** (0.087)		1.162*** (0.170)	
Master and Ph.D. (>15) (=1)	0.254 (0.366)		0.585*** (0.113)		0.361** (0.181)	
<i>Household characteristics</i>						
Land size (h.a. in log)	0.065* (0.035)		0.054*** (0.011)		0.066*** (0.016)	
Non-land asset value of the hh (Tk 100,000)	0.123 (0.128)		0.013 (0.011)		0.033* (0.019)	
HH member above 50/total workers	-0.378** (0.150)		0.042 (0.031)		-0.053 (0.049)	
Children under 5/total workers	-0.034 (0.159)		0.015 (0.028)		0.005 (0.059)	
=1 if hh has access to electricity	0.162 (0.174)		0.068* (0.035)		0.041 (0.087)	
<i>Village characteristics</i>						
Travel time to district town (hour)	0.234 (0.230)		-0.025 (0.063)		-0.140 (0.130)	
Travel distance to Dhaka km * 1/100	-0.044 (0.144)		-0.000 (0.027)		0.033 (0.034)	
Travel time to bank (hour)	-0.407* (0.213)		0.003 (0.061)		-0.049 (0.088)	
Proportion of home-based workers in non-farm sector excl ovr	0.521 (0.408)		0.271*** (0.100)		-0.214 (0.161)	
=1 if hh or village with major flood damage in the survey year	0.450 (0.475)		0.163 (0.137)		-0.138 (0.190)	
Division dummies	Yes		Yes		Yes	
lambda		0.261 (0.230)		-0.182** (0.089)		-0.260*** (0.068)
Constant	6.598*** (1.006)		8.482*** (0.155)		10.842*** (0.486)	
Observations	4,394	4,394	4,394	4,394	4,394	4,394

Notes; Heckman selection model for each category of worker (using all workers information)

Dependent variable=monthly salary in Bangladesh Taka (Log)

Numbers in parenthesis are standard errors

Standard errors are clustered by village

Base education = no education /illiterate

Education category is assigned using final education year of the worker (mutually exclusive)

Village-clustered standard errors in parentheses

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

Instruments = number of adults in households, lags of international and domestic migration network

Table 4.8 Determinants of the Initial Cost of International Migration in 2000, 2008 and 2014

	Initial Cost of Migration Per Worker (log)		
	2000	2008	2014
	n=143 (1)	n=226 (2)	n=381 (3)
	OLS		
<i>Household characteristics</i>			
Proportion of workers with primary education (1-5)	0.284* (0.168)	0.0574 (0.129)	-0.0528 (0.0851)
Proportion of workers with Jr.secondary education (6-8)	0.316** (0.138)	0.184 (0.138)	-0.114 (0.110)
Proportion of workers with mid-high secondary education (9-12)	0.444*** (0.158)	0.174 (0.119)	0.0640 (0.125)
Proportion of workers with tertiary education (13-15)	0.671** (0.288)	-0.0523 (0.181)	-0.129 (0.395)
Proportion of workers with master/Ph.D. (>15)	0.357 (0.247)	-0.402 (0.311)	-0.654 (0.433)
Land size (h.a. in log)	-0.00898 (0.0382)	-0.0224 (0.0357)	-0.0190 (0.0310)
Non-land asset value of the hh (Tk 100,000)	0.0222 (0.0632)	0.114 (0.0777)	-0.0421** (0.0192)
Total number of adults (working age 16-50)	0.0457* (0.0267)	0.0143 (0.0202)	0.0222 (0.0216)
No. of member above 50/total workers	-0.187 (0.121)	-0.0568 (0.0787)	0.0135 (0.0530)
No. of children under 5/total workers	0.0261 (0.0607)	0.0468 (0.0680)	0.0484 (0.0832)
=1 if hh has access to electricity	0.0407 (0.0796)	-0.0951 (0.0871)	0.188 (0.219)
<i>Village characteristics</i>			
Travel time to district town (hour)	-0.215*** (0.0779)	-0.0918 (0.238)	0.266 (0.377)
Travel distance to Dhaka km * 1/100	0.0751 (0.0489)	-0.00742 (0.0450)	0.171 (0.105)
Travel time to bank (hour)	0.152 (0.127)	-0.0618 (0.227)	-0.213 (0.237)
Proportion of home-based workers in non-farm sector excl own	-0.0474 (0.307)	-0.276 (0.209)	-0.0349 (0.362)
=1 if hh or village with major flood damage in the survey year	0.0273 (0.226)	-0.121 (0.0811)	0.312** (0.128)
<i>Migration network</i>			
Lagged international migration network in village	0.0129 (1.614)	0.132 (0.396)	0.427 (0.386)
Lagged domestic migration network in village	0.185 (0.467)	0.594 (0.440)	0.458 (0.666)
Year dummies	Yes	Yes	Yes
Division dummies	Yes	Yes	Yes
Constant	9.652*** (1.003)	11.83*** (0.612)	9.465*** (1.026)
Observations		750	
R-squared		0.199	

Notes; Pooled regression using all years of observations

Dependent variables =average cost of international migration per worker in Bangladesh Taka (log)

Numbers in parenthesis are standard errors

Standard errors are clustered by village

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

Base education = no education /illiterate

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 5.1 Migration Profile of Households by Migration Categories

	<i>NEW</i>	<i>CTN</i>	<i>POST</i>
Starting year of the first migration	2010 (2.78)	2002 (5.85)	2003 (6.09)
Duration of migration (cumulative 2000-2013, in months)	21.3 (11.5)	89.1 (81.4)	52.7 (58.7)
No. of migrants in 2008	0 (0)	1.52 (0.98)	1.36 (0.81)
No. of migrants in 2014	1.0 (0.43)	1.43 (0.80)	0 (0)
Migrant worker(s) years of schooling*	6.3 (3.7)	7.7 (3.3)	7.0 (3.6)
Migrant age at first migration*	24.4 (7.91)	24.5 (5.90)	26.4 (8.81)
Annual remittances in 2008 in 1,000 taka	0 (0)	184 (220)	150 (163)
Annual remittances in 2014 in 1,000 taka	99 (74)	205 (173)	0 (0)
Initial cost of migration in 1,000 taka	240 (199)	287 (283)	317 (259)
<i>Migrant Destination (multiple choice)</i>			
Saudi Arabia	0.11	0.64	0.58
United Arab Emirates (UAE)	0.32	0.33	0.29
Other ME (Oman Kuwait etc.)	0.37	0.27	0.14
Asia (Singapore Malaysia India only)	0.20	0.33	0.27
Europe	0.03	0.10	0.02
US	0.02	0.02	0.00
Others (Japan, Africa and unknown)	0.05	0.09	0.02
Observations	116	192	103

Notes; Standard deviations in parenthesis

New=new households, CTN=continuing migration households, POST=post migration households

Displaying mean value except for destination information

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

* Mean value if more than one workers are present

Table 5.2 Descriptive Data of Sample Households by Migration Categories in 2014: Household and Village Characteristics

	ALL Households(HH)		Non-Migrant HH (BASE)		New Migrant HH (NEW)		Continuing Migrant HH (CNT)		Post Migration HH (POST)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	mean	change from 2008a	mean	change from 2008a	mean	change from 2008a	mean	change from 2008a	mean	change from 2008a
<i>Household Characteristics^b</i>										
Household size including migrants	5.17	-0.66	4.96***	-0.57	6.21***	-0.22	6.62***	-1.04	4.72***	-2.09
Total number of adults (working age 16-50)	2.63	-0.29	2.48***	-0.24	3.43***	0.04	3.61***	-0.44	2.26***	-1.32
No. of member above 50/total workers	0.50	0.03	0.5	0.03	0.56	0.11	0.52	0.01	0.52	-0.02
No. of children under 5/total workers	0.40	-0.04	0.41	-0.05	0.26***	-0.12	0.34	0	0.51**	0.16
Age of hh head ^c	46.2	-1.7	45.5***	-1.5	49.8***	1	51.3***	-2.29	44.0**	-8.37
HH head years of education ^c	4.68	0.73	4.57**	0.68	3.59***	-0.38	5.28**	1.01	6.49***	2.12
Average years of educations among adults >18 in household	4.26	-0.27	4.27	-0.03	3.24***	-1.42	3.82**	-2.17	5.99***	0.31
Owned land of hh (ha)	0.38	-0.11	0.37	-0.1	0.35	-0.03	0.49*	-0.13	0.42	-0.28
Per adult owned land of hh (ha)	0.14	0.01	0.13	0	0.12	0.03	0.19**	0.07	0.17	0
=1 if hh with major flood damage in the survey year	0.01	-0.19	0.01	-0.17	0.03	-0.27	0.01	-0.26	0.01	-0.26
<i>Village Characteristics</i>										
Travel time to district town (hour)	0.61	-0.04	0.64**	-0.03	0.58	-0.05	0.49**	-0.07	0.40***	-0.05
Travel time to bank (hour)	0.42	0.03	0.43	0.03	0.53	0.12	0.41	0.05	0.29**	0.01
Travel time to market (hour)	0.29	-0.03	0.29	-0.02	0.43	0.06	0.31	0	0.23	-0.05
Travel distance to Dhaka km * 1/100 (time invariant)	2.07		2.17***		1.82**		1.51***		1.66**	
Proportion of home-based workers in non-farm sector excl own	0.46	0.03	0.45	0.02	0.50	0.03	0.48	0.02	0.52**	0.03
Proportion of households with electricity	63.7	6.02	61.1***	5.52	72.0**	10.92	77.9***	6.95	70.9	4.19
Village Population	1,758	-174	1,754	-179	2,098	32.62	1,634	-154	1,676	-403
No. rickshaw in Town per village population	0.02	-0.01	0.02	-0.01	0.02	0	0.03	0.01	0.02	-0.01
Observations	2,084		1,675		116		192		103	
% of total			80%		6%		9%		5%	

Notes:

*** p<0.01, ** p<0.05, * p<0.1, p=pvalue of t test comparing group mean to population mean (SE clustered at village level)

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

a. Change in value when comparing to the value in 2008 of the same group

b. We include migrants as household members in generating variables, unless otherwise indicated

c. Household head is defined as the one who lives in the household and makes day to day decisions. Migrants are not given this status.

Table 5.3 Consumption and Investments of Sample Households by Migration Categories in 2014

	ALL Households(HH)		Non-Migrant HH		New Migrant HH		Continuing Migrant HH		Post Migration HH	
			<i>(BASE)</i>		<i>(NEW)</i>		<i>(CNT)</i>		<i>(POST)</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	change from 2008a		change from 2008a		change from 2008a		change from 2008a		change from 2008a	
	mean	2008a	mean	2008a	mean	2008a	mean	2008a	mean	2008a
<i>Household Annual Consumption (adult equivalent)</i>										
Non-food expenses (utilities, consumables et) weekly	398	0.54	356***	0.42	445**	0.75	681***	1.14	507***	0.66
House construction and repairs	4,601	1.85	3,143***	1.41	4269	1.55	18,557***	3.21	2580	0.69
Religious contributions and other social events	5,077	1.87	3,840***	1.62	8322	2.52	12,740***	2.54	7,214*	1.33
<i>Household Annual Investments (per working age member)</i>										
Agricultural equipment asset value (per worker)	1,345	0.50	1,433	0.65	1,282	2.28	863*	-0.13	857	-0.59
Livestock asset value (p.w)	8,001	0.00	8,279	0.02	8,763	0.38	6690	-0.29	4,933***	-0.02
Business owner (=1)	0.23	0.15	0.24***	0.14	0.16**	-0.33	0.10***	0.00	0.30	0.30
Business capital in current price (p.w.)	19,949	2.82	16,284	2.57	12,673	0.58	9,282**	1.15	107,245	5.15
Health expenditure, adult equivalent	3,076	1.29	2,428***	1.12	3,762	0.25	7,261***	2.99	5,068	1.80
School enrolment (%) age 12-18 all b	0.71	0.11	0.70*	0.09	0.69	0.13	0.81**	0.17	0.75	0.12
School enrolment (%) age 12-18 boys only b	0.70	0.13	0.68**	0.11	0.74	0.17	0.79*	0.16	0.81	0.21
School enrolment (%) age 12-18 girls only b	0.72	0.11	0.72	0.11	0.63	0.09	0.80	0.16	0.74	0.17
Observations	2,084		1,675		116		192		103	
% of total			80%		6%		9%		5%	

Notes:

*** p<0.01, ** p<0.05, * p<0.1, p=pvalue of t test comparing group mean to population mean (SE clustered at village level)

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

a. Proportionate change in value when comparing to the value in 2008 of the same group

b. For education related variables, sample households are those with relevant school age children only

Table 5.4 Change in Business Investments by Household Migration Categories, 2008 & 2014 (HH Fixed-Effects)

	Investment in Business			
	Business owner (=1)		Capital stock	
	Div-dum	Vill-dum	Div-dum	Vill-dum
	(1)	(2)	(3)	(4)
<i>Migration Category a</i>				
<i>NEW mig HH(=1)</i>	-0.115*** (0.043)	-0.095** (0.043)	-0.533** (0.225)	-0.390* (0.220)
<i>Continued (CNT) mig HH(=1)</i>	-0.019 (0.030)	0.004 (0.033)	-0.129 (0.183)	0.053 (0.186)
<i>POST mig HH (=1)</i>	0.071 (0.049)	0.088* (0.050)	0.382 (0.273)	0.552** (0.274)
<i>Household Characteristics</i>				
Total number of adults (working age 16-50)	0.022*** (0.006)	0.024*** (0.006)	0.039 (0.031)	0.068** (0.031)
No. of member above 50/total workers	0.011 (0.018)	0.012 (0.018)	0.077 (0.097)	0.068 (0.096)
No. of children under 5/total workers	0.005 (0.011)	0.004 (0.012)	-0.036 (0.058)	-0.011 (0.060)
Age of hh head	0.001 (0.004)	0.001 (0.003)	0.002 (0.019)	0.002 (0.019)
Age-sq	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Proportion of workers with primary education (1-5) b	0.023 (0.046)	0.018 (0.046)	0.308 (0.224)	0.206 (0.222)
Proportion of workers with Jr.secondary education (6-8)	0.060 (0.062)	0.038 (0.062)	0.454 (0.334)	0.198 (0.330)
Proportion of workers with mid-high secondary education (9-12)	0.112* (0.066)	0.128* (0.067)	0.833** (0.369)	0.822** (0.384)
Proportion of workers with tertiary education (13-15)	0.041 (0.111)	0.068 (0.113)	0.990 (0.630)	0.722 (0.647)
Proportion of workers with master/Ph.D.>15)	0.176 (0.176)	0.196 (0.176)	1.176 (0.927)	0.980 (0.883)
=1 if hh with major flood damage in the survey year	-0.048* (0.026)	-0.152* (0.089)	-0.387*** (0.134)	-0.680 (0.525)
Owned land of hh (ha)	-0.011 (0.016)	-0.015 (0.015)	-0.017 (0.092)	0.018 (0.088)
Domestic Mig (=1)	-0.055** (0.022)	-0.055** (0.023)	-0.161 (0.112)	-0.248** (0.115)
<i>Village Characteristics</i>				
Travel time to district town (hour)	-0.009 (0.030)		-0.223 (0.153)	
Travel time to bank (hour)	-0.008 (0.042)		-0.097 (0.209)	
Travel time to market (hour)	0.051 (0.051)		0.763*** (0.261)	
Proportion of home-based workers in non-farm sector excl own	0.234** (0.107)		2.380*** (0.543)	
Proportion of households with electricity	-0.000 (0.000)		-0.003 (0.002)	
Village Population	-0.000 (0.000)		-0.000** (0.000)	
No. rickshaw in Town per village population	0.259 (0.407)		-1.561 (2.213)	
Division dummies*time(t=2)	Yes	No	Yes	No
Village dummies*time(t=2)	No	Yes	No	Yes
Constant	-0.001 (0.107)	0.104 (0.096)	4.064*** (0.565)	4.745*** (0.507)
Observations	4,168	4,168	4,168	4,168
R-squared	0.025	0.063	0.253	0.301
Number of sample	2,084	2,084	2,084	2,084

Notes; a. base group- no migration

b. base education group- no education

Robust standard errors in parentheses

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

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 5.5 Change in Agricultural Investments by Household Migration Categories, 2008 & 2014 (HH Fixed-Effects)

	Investment in Agriculture			
	Equipment		Livestock	
	Div-dum	Vill-dum	Div-dum	Vill-dum
	(1)	(2)	(3)	(4)
<i>Migration Category a</i>				
<i>NEW</i> mig HH(=1)	-0.556**	-0.428*	0.054	0.190
	(0.271)	(0.253)	(0.278)	(0.274)
<i>Continued (CNT)</i> mig HH(=1)	-0.892***	-0.645***	-0.475**	-0.338
	(0.236)	(0.245)	(0.213)	(0.226)
<i>POST</i> mig HH (=1)	0.021	0.462	-0.110	-0.011
	(0.328)	(0.307)	(0.298)	(0.295)
<i>Household Characteristics</i>				
Total number of adults (working age 16-50)	-0.012	-0.013	-0.140***	-0.141***
	(0.038)	(0.037)	(0.038)	(0.037)
No. of member above 50/total workers	0.185	0.154	-0.086	-0.101
	(0.124)	(0.117)	(0.112)	(0.110)
No. of children under 5/total workers	-0.070	-0.082	-0.194**	-0.218***
	(0.079)	(0.078)	(0.076)	(0.078)
Age of lh head	0.077***	0.069***	0.055**	0.060***
	(0.022)	(0.020)	(0.022)	(0.022)
Age-sq	-0.001***	-0.001***	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Proportion of workers with primary education (1-5) b	-0.214	-0.066	-0.203	-0.209
	(0.289)	(0.272)	(0.299)	(0.305)
Proportion of workers with Jr.secondary education (6-8)	0.027	0.145	-0.761**	-0.774**
	(0.379)	(0.362)	(0.371)	(0.378)
Proportion of workers with mid-high secondary education (9-12)	-0.662*	-0.503	-0.582	-0.499
	(0.388)	(0.374)	(0.369)	(0.382)
Proportion of workers with tertiary education (13-15)	-0.503	-0.394	-0.227	0.154
	(0.744)	(0.690)	(0.534)	(0.549)
Proportion of workers with master/Ph.D.(>15)	-0.142	-0.320	-0.211	-0.237
	(1.179)	(0.998)	(0.910)	(0.886)
=1 if lh with major flood damage in the survey year	0.038	0.924*	0.080	-0.459
	(0.162)	(0.541)	(0.159)	(0.524)
Owned land of lh (ha)	0.406***	0.490***	0.521***	0.508***
	(0.124)	(0.140)	(0.095)	(0.096)
Domestic Mig (=1)	0.122	-0.037	-0.276**	-0.278**
	(0.135)	(0.128)	(0.127)	(0.128)
<i>Village Characteristics</i>				
Travel time to district town (hour)	-0.102		-0.007	
	(0.174)		(0.168)	
Travel time to bank (hour)	0.265		-0.073	
	(0.256)		(0.243)	
Travel time to market (hour)	0.598*		0.935***	
	(0.305)		(0.286)	
Proportion of home-based workers in non-farm sector excl own	0.734		0.238	
	(0.688)		(0.609)	
Proportion of households with electricity	-0.001		-0.003*	
	(0.002)		(0.002)	
Village Population	-0.000		-0.000***	
	(0.000)		(0.000)	
No. rickshaw in Town per village population	-3.163		-4.963*	
	(2.821)		(2.762)	
Division dummies*time(t=2)	Yes	No	Yes	No
Village dummies*time(t=2)	No	Yes	No	Yes
Constant	1.336**	1.405**	6.589***	6.249***
	(0.677)	(0.599)	(0.638)	(0.601)
Observations	4,168	4,168	4,168	4,168
R-squared	0.074	0.200	0.082	0.123
Number of sample	2,084	2,084	2,084	2,084

Notes; a. base group- no migration

b. base education group- no education

Robust standard errors in parentheses

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

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 5.6 Change in Consumption by Household Migration Categories, 2008 & 2014 (HH Fixed-Effects)

	Consumption		
	Daily Expenditure	Housing	Rel festival /social event
	(1)	(2)	(3)
<i>Migration Category a</i>			
<i>NEW</i> mig HH(=1)	0.171*** (0.053)	0.139 (0.285)	0.346** (0.158)
<i>Continued (CNT)</i> mig HH(=1)	0.230*** (0.060)	0.844*** (0.304)	0.301** (0.122)
<i>POST</i> mig HH (=1)	0.012 (0.064)	0.269 (0.295)	-0.025 (0.168)
<i>Household Characteristics</i>			
Total number of adults (working age 16-50)	-0.055*** (0.008)	0.055 (0.039)	-0.039* (0.022)
No. of member above 50/total workers	-0.069** (0.028)	-0.058 (0.111)	-0.009 (0.054)
No. of children under 5/total workers	-0.069*** (0.018)	-0.056 (0.071)	-0.181*** (0.036)
Age of hh head	-0.009* (0.005)	-0.020 (0.019)	0.010 (0.009)
Age_sq	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Proportion of workers with primary education (1-5) b	-0.104 (0.070)	-0.690** (0.286)	0.450*** (0.157)
Proportion of workers with Jr.secondary education (6-8)	-0.031 (0.086)	-0.244 (0.369)	0.540*** (0.190)
Proportion of workers with mid-high secondary education (9-12)	0.216*** (0.080)	-0.126 (0.330)	0.619*** (0.207)
Proportion of workers with tertiary education (13-15)	0.485*** (0.133)	0.945 (0.688)	1.294*** (0.355)
Proportion of workers with master/Ph.D.(>15)	0.522*** (0.185)	-0.366 (1.250)	-0.153 (0.569)
=1 if hh with major flood damage in the survey year	-0.067 (0.132)	0.408 (0.624)	0.277 (0.285)
Owned land of hh (ha)	0.020 (0.025)	0.016 (0.102)	0.161*** (0.055)
Domestic Mig (=1)	0.076*** (0.028)	0.222 (0.146)	0.277*** (0.069)
Village dummy*time(=1 if t=2)	YES	YES	YES
Constant	5.838*** (0.137)	5.102*** (0.543)	6.188*** (0.274)
Observations	4,168	4,168	4,168
R-squared	0.447	0.126	0.334
Number of sample	2,084	2,084	2,084

Notes; a. base group- no migration

b. base education group- no education

Robust standard errors in parentheses

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

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 5.7 Change in Human Capital Investment by Household Migration Categories, 2008 & 2014 (HH Fixed-Effects)

	Human Capital Investment			
	Health Cost	School enrolment ratio (age12-18)		
		All	Boys	Girls
(1)	(2)	(3)	(4)	
<i>Migration Category a</i>				
<i>NEW mig HH(=1)*2014</i>	0.680*** (0.148)	0.131* (0.072)	0.096 (0.103)	0.315** (0.143)
<i>Continued (CNT) mig HH(=1)*2014</i>	0.475*** (0.123)	0.051 (0.089)	-0.148 (0.137)	0.146 (0.158)
<i>POST mig HH(=1)*2014</i>	-0.061 (0.146)	-0.123 (0.125)	0.294 (0.191)	-0.049 (0.312)
<i>Household Characteristics</i>				
Total number of adults (working age 16-50)	-0.012 (0.022)	-0.024* (0.013)	0.018 (0.023)	-0.019 (0.026)
No. of member above 50/total workers	0.168*** (0.058)	0.063* (0.036)	0.166*** (0.062)	-0.040 (0.070)
No. of children under 5/total workers	0.014 (0.040)	0.027 (0.034)	-0.003 (0.054)	0.035 (0.071)
Age of hh head	-0.000 (0.012)	0.026*** (0.007)	0.014 (0.015)	0.054** (0.021)
Age_sq	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.001** (0.000)
Proportion of workers with primary education (1-5) b	-0.065 (0.150)	0.069 (0.107)	0.116 (0.200)	-0.177 (0.186)
Proportion of workers with Jr.secondary education (6-8)	0.162 (0.190)	-0.235* (0.128)	-0.286 (0.246)	-0.003 (0.290)
Proportion of workers with mid-high secondary education (9-12)	0.041 (0.187)	-0.162 (0.136)	-0.019 (0.237)	-0.478* (0.283)
Proportion of workers with tertiary education (13-15)	-0.333 (0.361)	-0.086 (0.195)	-0.055 (0.303)	-0.221 (0.406)
Proportion of workers with master/Ph.D.(>15)	0.061 (0.841)	0.294 (0.374)	1.519** (0.604)	-0.034 (0.381)
=1 if hh with major flood damage in the survey year	0.404 (0.287)	-0.123 (0.104)	-0.371* (0.192)	0.092 (0.227)
Owned land of hh (ha)	0.055 (0.078)	0.025 (0.032)	-0.028 (0.056)	0.070 (0.079)
Domestic Mig (=1)	0.175** (0.073)	-0.001 (0.044)	-0.114 (0.073)	0.012 (0.109)
Village*time (t=2)	Yes	Yes	Yes	Yes
Child age dummies	Yes	Yes	Yes	Yes
Constant	6.207*** (0.322)	0.177 (0.203)	0.312 (0.405)	-0.503 (0.580)
Observations	4,168	2,242	1,478	1,273
R-squared	0.275	0.166	0.276	0.274
Number of sample	2,084	1,606	1,183	1,046

Notes; a. base group- no migration

b. base education group- no education

Robust standard errors in parentheses

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

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Table 5.8 Comparison of Results: Changes in Investment and Consumption among Migrant Households, 2008 & 2014 (HH Fixed-Effects)

	business owner (=1)	Business Capital value	Agriculture Equipment	Livestock	Health Cost	Enrolment all (age 12-18)	Boys	Girls	Daily Expenses	Housing
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Specification (1) Heterogeneous Outcome Model</i>										
<i>NEW</i> mig HH(=1)	-0.095** (0.043)	-0.390* (0.220)	-0.428* (0.253)	0.190 (0.274)	0.680*** (0.148)	0.131* (0.072)	0.096 (0.103)	0.315** (0.143)	0.171*** (0.053)	0.139 (0.285)
<i>Continued (CNT)</i> mig HH(=1)	0.004 (0.033)	0.053 (0.186)	-0.645*** (0.245)	-0.338 (0.226)	0.475*** (0.123)	0.051 (0.089)	-0.148 (0.137)	0.146 (0.158)	0.230*** (0.060)	0.844*** (0.304)
<i>POST</i> mig HH (=1)	0.088* (0.050)	0.552** (0.274)	0.462 (0.307)	-0.011 (0.295)	-0.061 (0.146)	-0.123 (0.125)	0.294 (0.191)	-0.049 (0.312)	0.012 (0.064)	0.269 (0.295)
<i>Specification (2) Average Treatment Effect</i>										
MigHHD=1 if <i>NEW</i> or <i>CNT</i> or <i>POST</i> ==1	-0.008 (0.028)	0.030 (0.148)	-0.295* (0.178)	-0.073 (0.172)	0.409*** (0.092)	0.049 (0.062)	0.039 (0.092)	0.188* (0.113)	0.156*** (0.041)	0.502*** (0.194)
<i>Specification (3) Estimation based on Change in Migration Status</i>										
Mig HHD=1 if household has migrant in survey year	-0.097*** (0.030)	-0.493*** (0.158)	-0.484** (0.190)	0.049 (0.192)	0.367*** (0.100)	0.108* (0.061)	-0.026 (0.094)	0.202 (0.126)	0.106*** (0.040)	-0.048 (0.194)

Notes; Robust standard errors in parentheses

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

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Appendix Table A4.1 Factors Associated with the Characteristics of International Migrant Households in 2000, 2008 and 2014 (Probit)

	Migrant HH (=1)			New Migrant HH (=1)		
	2000	2008	2014	2000	2008	2014
	n=145	n=231	n=385	n=129	n=85	n=76
	(1)	(2)	(3)	(4)	(5)	(6)
	Probit			Probit		
<i>Household characteristics</i>						
Proportion of workers with primary education level (1-5)	0.027 (0.017)	0.036* (0.022)	0.056*** (0.019)	0.027 (0.018)	0.002 (0.015)	-0.006 (0.009)
Proportion of workers with Jr.secondary education level (6-8)	0.040* (0.022)	0.083*** (0.022)	0.103*** (0.020)	0.049** (0.020)	0.039** (0.016)	0.006 (0.013)
Proportion of workers with mid-high secondary education level (9-12)	0.075*** (0.019)	0.099*** (0.020)	0.105*** (0.019)	0.071*** (0.021)	0.039** (0.015)	0.001 (0.010)
Proportion of workers with tertiary education level (13-15)	-0.027 (0.039)	-0.019 (0.039)	0.029 (0.038)	-0.048 (0.034)	-0.036 (0.032)	0.020 (0.017)
Proportion of workers with master/Ph.D. level (>15)	0.041 (0.051)	-0.047 (0.070)	0.034 (0.044)	0.128*** (0.049)	-0.050 (0.062)	-0.020 (0.030)
Land size (h.a. in log)	0.018*** (0.005)	0.020*** (0.005)	0.009** (0.004)	0.013*** (0.005)	0.006* (0.003)	-0.002 (0.002)
Non-land asset value of the hh (in 100,000 Bangladesh Taka)	0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Total number of adults (working age 16-50)	0.002 (0.004)	0.018*** (0.004)	0.038*** (0.004)	-0.002 (0.005)	0.008*** (0.003)	0.007*** (0.002)
No. of member above 50/total workers	0.038*** (0.009)	-0.002 (0.012)	0.009 (0.010)	0.034*** (0.007)	-0.007 (0.008)	0.004 (0.006)
No. of children under 5/total workers	-0.011 (0.009)	-0.008 (0.011)	-0.029*** (0.010)	-0.009 (0.007)	-0.018* (0.009)	-0.004 (0.005)
=1 if hh has access to electricity	0.017 (0.013)	-0.004 (0.014)	0.010 (0.015)	0.018 (0.013)	-0.002 (0.012)	-0.012 (0.010)
=1 if hh or village with major flood damage in the survey year	-0.038 (0.026)	0.015 (0.015)	-0.030 (0.052)	-0.025 (0.030)	0.027*** (0.010)	0.009 (0.020)
<i>Village characteristics</i>						
Travel time to district town (hour)	-0.039*** (0.010)	-0.077*** (0.025)	-0.071*** (0.019)	-0.037*** (0.010)	-0.046** (0.020)	-0.009 (0.011)
Travel distance to Dhaka km * 1/100	-0.032*** (0.009)	-0.012 (0.009)	-0.004 (0.008)	-0.025*** (0.008)	-0.003 (0.009)	0.006 (0.005)
Travel time to bank (hour)	-0.035* (0.018)	0.022 (0.033)	0.065*** (0.017)	-0.024 (0.017)	0.011 (0.024)	0.011 (0.010)
Proportion of home-based workers in non-farm sector excl own	-0.012 (0.042)	0.007 (0.036)	-0.054 (0.034)	-0.006 (0.046)	-0.019 (0.029)	-0.001 (0.023)
<i>Migration network</i>						
Lagged international migration network in village	0.731*** (0.226)	0.751*** (0.101)	0.505*** (0.069)	0.688** (0.280)	0.269** (0.133)	0.066 (0.068)
Lagged domestic migration network in village	-0.070 (0.067)	-0.124* (0.073)	-0.041 (0.057)	-0.045 (0.066)	0.011 (0.059)	-0.016 (0.029)
Division dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,741	1,947	2,768	1,693	1,769	2,487

Notes; Probit model using each year observations, reporting marginal effect evaluated at mean values

Dependent variables =1 for migrant households or new migrant households in the survey year

New migrant hh = starting first migration within 4 years including the survey year

For regression (4)-(6), past and on-going migrant households are removed from control group

Numbers in parenthesis are robust standard errors , *** p<0.01, ** p<0.05, * p<0.1

Base education = no education /illiterate

Prices are adjusted at 2010 level by using CPI from World Development Indicators (WDI)

Appendix Table 5.1 Characteristics of Households by Migration Categories in 2014 (Multinomial Logit)

	NEW	CNT	POST
	Mlogit		
<i>Household Characteristics</i>			
Owned land of hh (ha)	0.047 (0.164)	0.371*** (0.113)	0.399*** (0.146)
Household size including migrants	0.221*** (0.039)	0.200*** (0.038)	-0.099 (0.066)
No. of member above 50/total workers	0.039 (0.180)	-0.290* (0.176)	0.231 (0.216)
No. of children under 5/total workers	-0.834*** (0.227)	-0.275 (0.195)	0.238 (0.186)
Age of hh head	0.001 (0.010)	0.017* (0.010)	-0.002 (0.011)
Average years of educations among adults >18 in household	-0.109*** (0.035)	-0.071** (0.031)	0.166*** (0.037)
=1 if hh with major flood damage in the survey year	0.623 (0.674)	-0.788 (1.151)	-0.332 (1.038)
<i>Village Characteristics</i>			
Travel time to district town (hour)	-0.490 (0.356)	-1.121*** (0.259)	-1.361** (0.594)
No. rickshaw in Town per village population	-0.493 (4.702)	5.800* (3.513)	-1.223 (4.882)
Travel time to bank (hour)	-0.226 (0.676)	0.582 (0.514)	-1.968* (1.165)
Travel time to market (hour)	0.346 (0.659)	-0.727 (0.573)	0.117 (1.248)
Proportion of home-based workers in non-farm sector excl. own	-0.490 (0.861)	-2.721*** (0.627)	-0.839 (0.776)
Proportion of households with electricity	0.007 (0.005)	0.010** (0.005)	0.001 (0.005)
Village Population	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)
Travel distance to Dhaka km * 1/100 (time invariant)	-0.155 (0.124)	-0.439*** (0.123)	-0.517*** (0.130)
domestic migration (=1)	-1.195*** (0.269)	-2.044*** (0.297)	-0.356 (0.324)
Division dummies	Yes	Yes	Yes
Constant	-3.835*** (1.015)	-1.875** (0.882)	-1.851 (1.235)
Observations	2,084		

Notes: Base group is non-migrant households throughout 2008-2014

Reporting marginal effect evaluated at mean values

NEW=initiated migration after 2008 and continuing to 2014 (n=116), CNT=continuing migration between 2008-2014 (n=192),

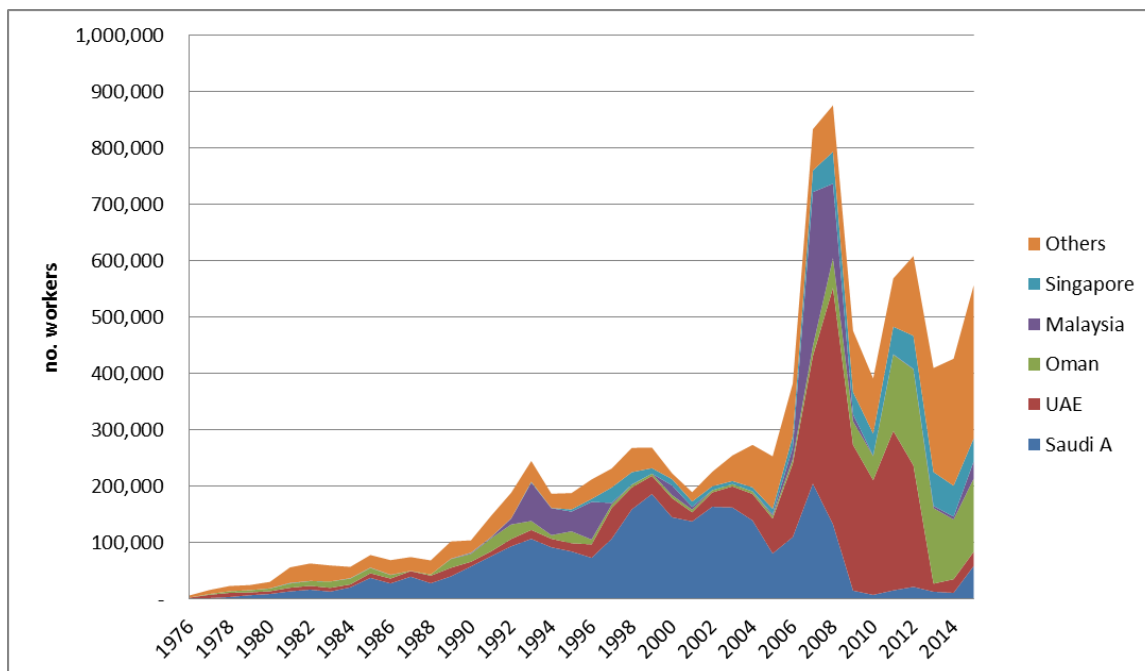
POST=migrated in 2008 but terminated in 2014(n=103)

Numbers in parenthesis are robust standard errors

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

Figures

Figure 1.1 Annual Outflows of Overseas Workers from Bangladesh by Major Destination Countries, 1976-2015



Source: Bureau of Manpower, Employment and Training, Bangladesh

Figure 3.1 Map of Survey Sample Villages

(Sample villages are indicated by red area)

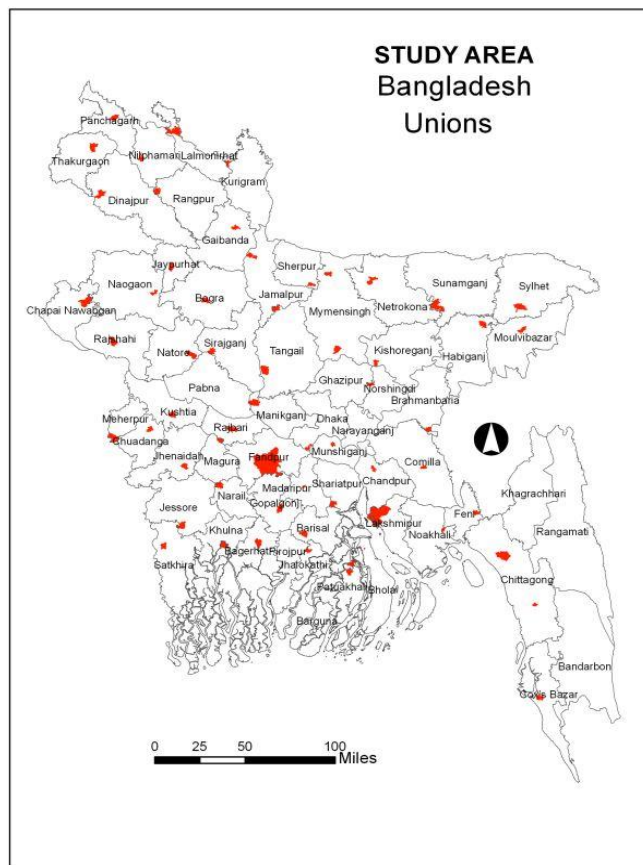
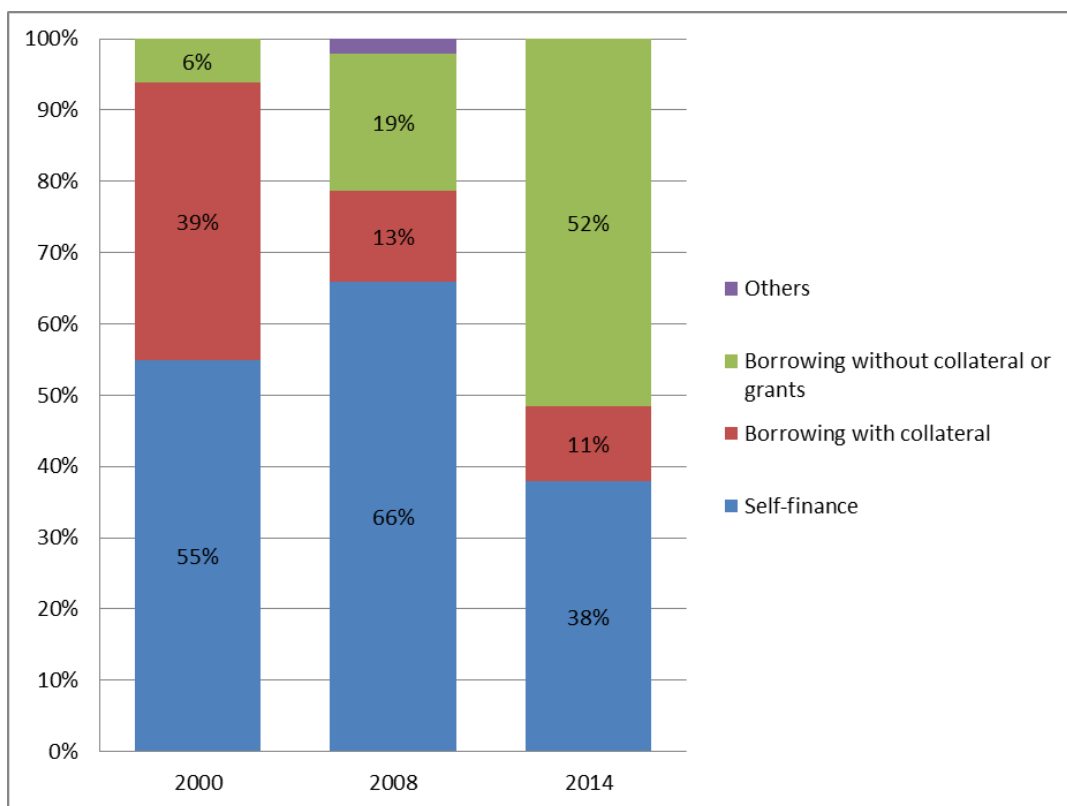


Figure 4.1 Primary Sources of Funds for Migration among New Migrants in 2000, 2008, and 2014



Note: The numbers of observations are 133, 47, and 66 for the years 2000, 2008, and 2014.

Figure 5.1 Investment Pattern by Migration Status

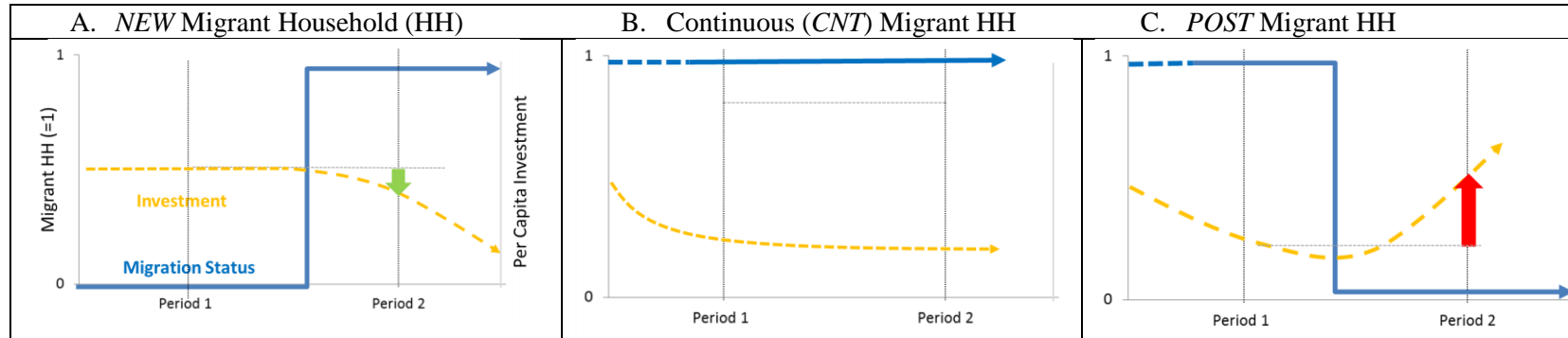
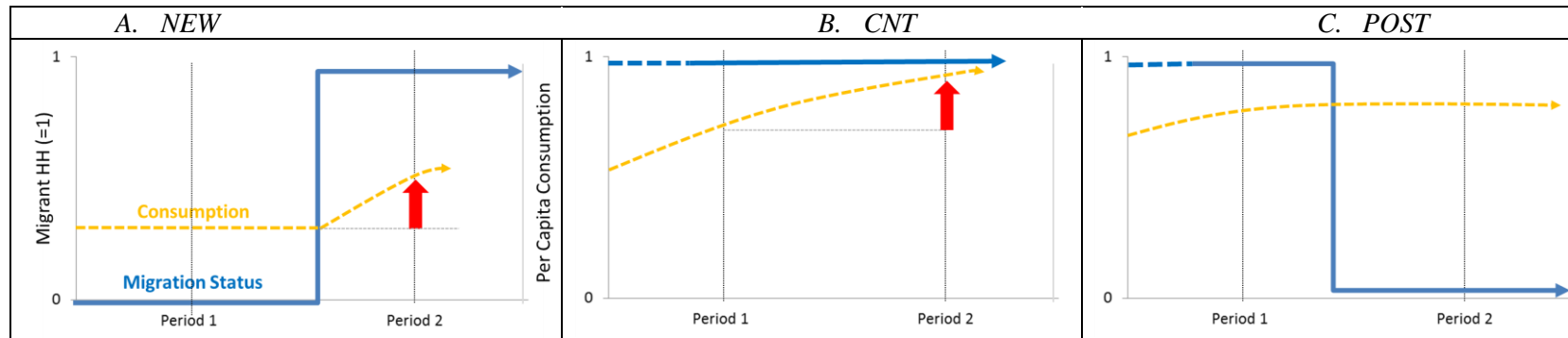


Figure 5.2 Consumption Pattern by Migration Status



Annexes

Annex 1. Supplementary Questionnaire on Migration (2014)

62 Village Survey

Guided by BRAC

A Survey on Changes in Rural Economy and Livelihoods

Questionnaire for Household Survey

(Operated by Socioconsult Ltd.)

Household Survey Questionnaire

IDNO :

Village : _____

Union : _____

Para/Mohalla : _____

Holding : _____

Upazila : _____

District : _____

Name of interviewer : _____

Date of interview : _____

Name of supervisor : _____

Date of data check : _____

Name of HH head: _____ Member ID number

Father's/husband's name: _____

Respondent's name: _____ ID number

Relationship with HH head : _____

(Use relationship code from question 101)

Use respondent's member ID number from question 101

Signature of Supervisor

Signature of Field Investigator/Interviewer

Additional Questionnaire for IRRI/BRAC/GRIPS Survey

1200. Migration history of current household members

1201. In the past 10 years (2005-2014), has any of the current household members migrated (for at least 1 month) to town or abroad for work or study? 1=Yes; 2=No of them If yes, how many

HH ID	Member number (Use unique ID derived from 101 and 102a (+100) (Note**))	Name of the family member/s	Relationship with HH head (Code)	Gender 1=Male 2=Female	Occupation before the first migration? (Code)	How many times has this person migrated in the past 10 years?	Year of 1 st Migration	Age at the time of 1 st Migration	Marital Status (Code)	If married, age at the time of 1 st marriage	Years of schooling (last class passed) (Code)	If presently away from home, contact details (mobile phone no?)
1	2	3	4	5	6	7	8	9	10	11	12	13

**Note: Use member ID from 101. But to get ID number for migrated persons add 100 to member number at 102a. For example, for no. 1 member of 102a, the ID will be 101.

Code (Column-4) Relationship: 1= Household Head, 2= Wife/ Husband, 3= Son/daughter, 4=Father/mother, 5=Brother/sister, 6=Son-in-law/Daughter-in-law, 7= Grand son/ Grand daughter, 8=Nephew/niece, 9=Brother-in-law/Sister-in-law, 10= Brother’s wife / Sister’s husband, 11=Uncle /Aunt, 12= Grand father / mother, 13=Father-in-law/Mother-in-law, 14= others (specify)

Code (Column-6) Previous occupation : 1=Own land cultivation, 2=Agri. Labourer, 3=Construction Labourer, 4= Semi-skilled construction Labourer (Welding machine operator/Electrician/ Mechanic/Mason/Carpenter etc.), 5= Cleaner, 6= Rickshaw puller, 7=Bus/Taxi driver, 8=Cook/waiter in hotel, 9=Shopkeeper, 10=Garments labourer, 11=Factory labourer (other than garments labourer), 12=House work, 13=Physician/Engineer/Lawyer, 14=Teacher, 15=Nurse / health worker, 16= Trader/businessman (Own), 17= Business administration/management, 18=Army/Navy/Air force, 19=Govt .Employee, 20=Housewife, 21=Student, 22=Unemployed, 99=Others (Specify)

Code (Column-10) Marital Status : 1=Unmarried, 2=Married, 3=Widow/widower,4=Divorced, 5=Living separately,

Code (Column -12) Last class passed : 1=Class one, 2=Class two, 3= Class three, 4= Class four, 5= Class five, 6= Class six, 7= Class seven, 8= Class eight, 9= Class nine, 10= S.S.C, 11=Eleventh class, 12=H.S.C, 13=Thirteenth class, 14=Graduate, 15 Fifteenth class, 16= Post graduate, 0=Illiterate, 20=Infant (Below-5), 21= Hafezi

*Women’s travel to other place for marriage will not be considered as ‘Migration’

1202. Individual migration history of household members

Write migration related experience of all migrated members listed in Question 1201 separately. Use separate sheet for each member.

HH ID	ID of migrated member (Note*)	Migration Experience (Total Entries)	Starting Year of Migration	How many months outside the household	Location of Migration (code)	Name of destination (code)	Reason of migration (code)	Informer of the work (Code)	Nature of job (Code)	Nature /mode of wages 1=Monthly 2=Daily	Duration of contract (Month)	Monthly salary (Taka)	How much remittance did this household get per year?	How much remittance did the household receive in total (Tk).	Cost of 1 st migration, including that for Traveling/ Visa/Commission etc.) (Tk)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		1													
		2													
		3													
		4													
		5													

If necessary, use additional sheet

*Note: Same ID as given at A2

Code (Column -6) Location : 1=Within District, 2=Within country but other district, 3=Abroad

Code (Column -7) Name of the destination : For domestic locations : 1= Other village within Upazila, 2=Village in other Upazila, 3=Own district town, 4=Other district town, 5=Dhaka City, 6=Other Divisional town.

Foreign locations: 7=Saudi Arabia, 8=UAE, 9=Kuwait, 10=Oman, 11=Qatar, 12=Bahrain, 13=Lebanon, 14=Lybea, 15=Jordan, 16=Sudan, 17-Iraq, 18-Iran, 19=Malaysia, 20=Singapore, 21=South Korea, 22=Hong Kong, 23=Japan, 24=Egypt, 25=Moriches, 26=Brunei, 27=England, 28=Italy, 29=USA, 30=Australia, 31=Canada, 32=Spain, 33=India, 34=Turkey, 35=Other (Specify)

Code (Column-8) Causes of migration: 1=In search of job, 2= River erosion, 3= Climate change, 4=Unprofitable agriculture, 5= For higher wages, 6= For Business, 7= Insecurity, 8=Other (Specify)

Code (Column -9) Informer of the work (Note that it is different from migration module) : 1=Family members within Bangladesh, 2=Migrated family members, 3=Uncle/Aunt and other relations living in Bangladesh, 4= Uncle/Aunt and other relations living abroad, 5=Neighbors/ Members of the society, 6=Chairman / local elite, 7=Broker /chieftain, 8=Political leaders / workers, 9=High ranked/salaried service-holder/ businessman/ industrialist, 99=Others (Specify)

Code (Column -10) Nature of Job : Within country : 1=Service, 2=Education, 3=Labourer, 4= Construction work, 5=Business, 6=Physician/Engineers/Nurse, 7=Household work (for female), 8=Others (Specify)

For migrated persons : 9=Construction work, 10=Electrician, 11= Welding, 12=Driver, 13=Mechanic, 14=Carpenter, 15=Household work /cleaning,

16=Agri. Work,

17=Salesman /work at restaurant, 18=Painter, 19=Gardener /house-keeping, 20=Guard, 21=Business, 22=Cook, 23=Service, 24=Transport worker, 25=Teaching , 26=Other (Specify)

1203. Migration information of those who were family members in the past but not now

1203.1 During past 10 year (2005-2014) did any former member of the household (not mentioned earlier) go to town or abroad for work or education?

1=Yes; 2=No

If yes write their names and answer these questions . Give member ID numbers: a-z.

Hous e hold ID	Member ID a-z	Member's name	Relations hip with HH head (code)	Gender 1=Male 2=Fem ale	Which year did s/he leave the HH?	Age at the time of 1 st migrati on	Marit al Status (Code)	If married, age at the time of 1 st marriage	How many years did s/he study at school (last class) (Code)	Occupatio n before first migration? (Code)	How many times did s/he migrated during last 10 years?	Contact details, if s/he is still in aboard? (mobile number)
1	2	3	4	5	6	7	8	9	10	11	12	13
	a											
	b											
	c											
	d											
	e											

** Use ID number of members so that former migrated members and present members can be differentiated.

1203.2. Give answer of the above mention migrated member

ID of migrat ed mem ber	Member - ship ID of migrate d member (note*)	Migrati on experie nce Total entries (Note*)	Starti ng year of migrati on	How many months outside the household	Loca tion of migr ation (cod e)	Name of destinati ons (code)	Reaso n for migrat ion (code)	Informe r of work (code)	Type of work (code)	Duratio n of contract in months	Mont hly salary Tk.	How much remittance did the household receive per year? Tk.	How much remittance did the household receive in total (Tk).	Cost of 1 st migration, including that for Traveling/ Visa/Comm ission etc.) (Tk)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		1												
		2												
		3												
		4												
		5												

Use more sheets when needed.

**Note: Use the same ID indicated in the question 2 of C-1.

Use same notes/codes as in B, except for question 2.

1204. Financial and Wealth information (ask this question to all households regardless of whether they have migrated members or not)

1204.1 In what modality do you receive remittance? (Multiple choice in order of frequency)

A Mode of international remittance

Through which channel do most remittances come?

- | | | |
|----------------------------------|--------------------------|----------------------|
| 1. Most important channel | <input type="checkbox"/> | Starting year of use |
| _____ | | |
| 2. Second most important channel | <input type="checkbox"/> | Starting year of use |
| _____ | | |
| 3. Third most important channel | | Starting year of use |
| _____ | | |

B. For domestic remittances

Through which channel do most remittances come?

- | | | |
|----------------------------------|--------------------------|----------------------|
| 1. Most important channel | <input type="checkbox"/> | Starting year of use |
| _____ | | |
| 2. Second most important channel | <input type="checkbox"/> | Starting year of use |
| _____ | | |
| 3. Third most important channel | | Starting year of use |
| _____ | | |

Code (A & B) (Channels of remittances) : 1=Bank account, 2=Post office, 3=Remittance company, 4=Hand carry by friends/ relatives, 5=Money launderer (hundi), 6=Hand carry self, 7=Mobile cash/mobile phone transfer, 99= Other (specify)

1204.2 Who controls the remittances?

Code: 1=Head of household, 2=Migrated person himself/herself, 3=Both (Migrated person & household head), 4=Wife/husband of the migrated person, 5= other members in the family, 99= Other (specify)

1204.3 Who makes the decisions as to how the remittance will be spent ?

Code: 1=Head of household, 2=Migrated person himself/herself, 3=Both (Migrated person & household head), 4=Wife/husband of the migrated person, 5= other members in the family, 99= Other (specify)

1204.4 During the last one year did this household receive remittance from someone who is not a member of this household?

1, No=2

If yes, A: How much domestic remittance in total (Tk.)

B: How much international remittances in total (Tk.)

1204.5 Do you have a bank account? Yes=1, No=2

A If yes, how much do you have in the account? (Tk.)

B What are the purposes of the savings?
First purpose Second purpose Third purpose

Code : (1204.5- A & B: Purpose of savings) 1=To meet day-to-day expenditures, 2=Fund for emergency situation, 3=Marriage, 4=Festivals, 5=To meet expenditures of treatment, 6=Loan repayment, 7=Education, 8=House repair/construction, 9=Buying agricultural inputs, 10=Investment in business, 11=Expenditure for sending other HH members to foreign country, 12=Purchasing of land, 13=Land mortgage, 14=Fund for retirement age, 99=Others (Specify)

1204.6 Do you have any other form of savings (Value in Tk.)?

A. Jewelry

B. Money lent to others

C. Other (specify)

D. What are the purposes of these savings?

1. First purpose 5. Second purpose 3. Third purpose

Code : (1204.5- A & B: Purpose of savings) 1=To meet day-to-day expenditures, 2=Fund for emergency situation, 3=Marriage, 4=Festivals, 5=To meet expenditures of treatment, 6=Loan repayment, 7=Education, 8=House repair/construction, 9=Buying agricultural inputs, 10=Investment in business, 11=Expenditure for sending other HH members to foreign country, 12=Purchasing of land, 13=Land mortgage, 14=Fund for retirement age, 99=Others (Specify)

Annex 2. Detailed description on methodology classifying migrants into three distinct groups

The *NEW* migrant households are those who started sending family members abroad for work after the survey time in 2008 and continued to do so till the time of survey in 2014. They have no prior history of migration dating back to the year 2004. The continuing migrant households (*CTN*) are those who had migrants in 2004 to 2008 and continued on sending migrants till 2014. The *POST* migration households are those who had migrant workers overseas in 2008 but stopped having one by 2014. These households also stopped receiving remittances in 2014. I am able to confirm the presence of returned migrants in around 60% of the *POST* households by matching household members in the two survey rounds (2008 and 2014) using migrant age, sex and years of education.⁴⁷ For the other 40% of the *POST* households, it is likely that migrants' bio data have errors or that migrants separated themselves from the family in Bangladesh because they have permanently migrated. The latter case should be very rare because most migrants work at low skill sectors in the Middle East and East Asian where the chance of settlement is slim. The households with no experience of migration from 2004 to 2014 are placed in control group (*BASE*).

While most households fall into three groups using above criteria, there are outliers. These are households which reported that they started migration after 2008 but stopped migration by 2014. A total of 12 households fall into this category. I have

⁴⁷ The survey contains household member data but this information does not come with unique and traceable ID code for individual.

looked closely at the migration history of these households from past surveys and found that some of these households are actually underreporting migration episodes. For the households with episodes of migration during the surveys of 2004 and 2008, I classified these households into post migration group (*POST*). Still I had 7 households that initiated migration for the first time after 2008 and stopped sometime between 2008 and 2014. These households do not fall under any of the four household categories, and, hence, are removed from the sample (they are not included in the 2084 household samples).