Who Remits? The Case of Bangladesh

Kazi Abdul, Mannan and Gin Kok, Wei

UUMK, Universiti Kebangsaan Malaysia

2007

Who Remits? The Case of Bangladesh

Kazi Abdul Mannan[1]
UUMKL

Gin Kok Wei
Universiti Kebangsaan Malaysia

ABSTRACT

In this study use a unique survey data from Bangladesh to assess the characteristics of the individuals who remit. Unlike all previous studies, this study have information on the sender and the receiver from the same source which estimate a heteroskedastic Tobit with a known form of heteroskedasticity which allows to examine the correlation of the remitting decisions of migrants in the same original receiving household. This study find evidence supporting a positive correlation between migrants' remitting decisions. Gender, labor force status, and destination of the migrant all have significant effects on remittances. The relationship of the migrant to the head of the household also affects the remitting behavior. The labor status and the level of education of the head of the receiving household influence the migrant's decision to participate in the remitting behavior. Evidence suggests that there is a positive correlation between migrants' remitting decisions among migrants belonging to the same receiving household. The main contribution of this paper is the ability to quantify the correlation of the remitting decisions between migrants who belong to the same receiving household. The ability to measure this relationship is crucial since it allows further understanding of how intra-family decisions are made regarding the allocation of resources across households that are separated by migration. The knowledge of the mechanism of intra-family remitting decisions shed light on the indirect outcomes of remittance policies.

[1] **Corresponding Author:** Professor Kazi Abdul Mannan, School of Business Management, UUMKL, E-mail: mannankazi@yahoo.com

1.1 INTRODUCTION

In that last two decades remittances have gained interest due to their continuous increase and their large size. For several developing countries remittances constitute a large portion of their gross domestic product and sometimes exceed foreign direct investment. Official estimates show that remittances averaged around 60 billion U.S. dollars per year in the 1990s (World Bank) and reached 167 billion U.S. dollars in 2005 (World Bank's Global Economic Prospects). In some countries remittances constitute a significant share of gross domestic product (GDP) (Connell & Brown 2004; De Haas 2006; Heilmann 2006; Chami et al., 2006). Out of the first 20 developing countries receiving remittances six are from Central and South America with a total of 18.5 billion U.S. dollars. In some countries remittances constitute a significant share of gross domestic product (GDP).

Remittances constitute more than 10% of the GDP in twelve developing countries (Mannan & Wei 2006). The growing importance of these transfers of money has produced a number of studies to explore their dimensions, determinants, effects and the government policies designed to influence them (Mannan & Kozlov 2001; Mannan & Krueger 2000). Migrant remittances affect the performance of the economy. Glytsos (2002) shows that remittances have the potential to substitute for foreign aid. Chami et al. (2003) find that remitting takes place under asymmetric information and imply that remittances have a negative impact on economic growth (Mannan & Kozlov 2005; Mannan & Krueger 2004)). Amuedo-Dorantes and Pozo (2004) find that workers' remittances can reduce the international competitiveness of the receiving countries' export sector by appreciating the real exchange rate in the receiving economies. Remittances also impact the behavior at the household level. Funkhouser (1992) finds opposite effects of remittances inflows on the Nicaraguan and Salvadorian labor markets. Edwards and Ureta (2003) find that remittances have a large effect on school retention. All these studies stress on better understanding the remittance behavior in order to develop economic policies that take full advantage of these flows (Mannan & Kozlov 2003; Mannan & Krueger 2002).

In this study use a unique survey data from Bangladesh to assess the characteristics of the individuals who remit. Unlike all previous studies, this study have information on the sender and the receiver from the same source which estimate a heteroskedastic Tobit with a known form of heteroskedasticity which allows to examine the correlation of the remitting decisions of migrants in the same original receiving household. The main contribution of this paper is the ability to quantify the correlation of the remitting decisions between migrants who belong to the same receiving household. The ability to measure this relationship is crucial since it allows further understanding of how intra-family decisions are made regarding the allocation of resources across households that are separated by migration. The knowledge of the mechanism of intra-family remitting decisions shed light on the indirect outcomes of remittance policies. Probably, believe this is the first paper to address this issue. This paper also adds to the remittance literature in computing changes in both the likelihood of remitting and the amount remitted.

Gender, labor force status, and destination of the migrant all have significant effects on remittances. The relationship of the migrant to the head of the household also affects the remitting behavior. The labor status and the level of education of the head of the receiving household influence the migrant's decision to participate in the remitting behavior. Evidence suggests that there is a positive correlation between migrants' remitting decisions among migrants belonging to the same receiving household.

2.1 LITERATURE REVIEW

Lucas and Stark (1985) discuss several hypotheses for motivations to remit. The authors present three reasons for remitting ranging from pure altruism to pure self-interest spanning a more tempered point of view combining these two extremes. Lucas and Stark explore these concepts using data from the National Migration Study of Botswana. Remittances are determined partly by the earnings of the migrant and partly by his years of schooling. Lucas and Stark also note a positive trend between these flows of money and per capita income of the household. Oberai and Singh (1980) using a household survey in the Ludhiana district of the Indian Punjab report a positive relation between low income migrant and the probability of remittances and a negative correlation between the number of household members working and this same likelihood. In addition, the authors find that the level of education does not affect the decision whether or not to remit.

Based on a nationwide survey of households in Kenya, Knowles and Anker (1981) present empirical evidence on issues related to remittances. The authors first stress that remittances are primarily limited to members of the nuclear family. Moreover they conclude that migrant's income of the sending unit, education level, sex, ownership of a house back home and the fact of a spouse residing away all positively affect the probability to remit. Knowles and Anker add that the length of time a migrant has resided away negatively affect these chances. Also migrant's schooling and income negatively influence the level of remittances. Further, Funkhouser (1995) uses data from El Salvador and Nicaragua to investigate and compare the determinants of remittances in both countries. Funkhouser applies a separable utility function that values both absentee's utility and the household utility. The author also follows a linear functional form in estimating remittances. Funkhouser presents fairly similar findings for El Salvador and Nicaragua. In both countries education is negatively related to the probability of remittances while it is positively associated to the level of these money transfers. Using the Salvadoran data Funkhouser notes that age and gender do not affect the likelihood and the level of remittances. In Nicaragua, age is adversely correlated with both the probability and the amount of remittances. Furthermore, Funkhouser examines familial relationship and the period of time spent abroad and their effects on remittances.

Rodriguez (1996) uses a data set from the Philippines to note a positive connection between the age of the migrant, time since migration and the chance of remitting. However, equally to Knowles and Anker this incidence decreases for long absences. Rodriguez also remarks that being a member of the nuclear family increases the probability of remitting. Similarly to Oberai and Singh, Rodriguez does not find a clear association relating education to remittances. Lianos (1997) focuses on the remittances to Greece from Germany for a period of 30 years. Lianos tests the

……

significance of a set of factors in terms of their effects on remittances. The author finds that the level of migrant's income has a positive and major effect on remittances to Greece. Lianos also calculates the elasticity of remittances with respect to income. This elasticity is greater than one suggesting a large response of remittances for any small change in income. Furthermore, Lianos finds that household income in the country of origin does not significantly influence the level of remittances.

Clearly, the empirical evidence on the determinants of remittances is inconclusive. It can be summarized these findings as both Oberai and Singh (1980) and Rodriguez (1996) find that education and remittances are not related. Lucas and Stark (1985) along with Knowles and Anker (1981) find a relationship between these two even though they do not agree on its direction. In addition, Lianos (1997) finds that household income is uncorrelated with remittances while Lucas and Stark (1985) document a positive correlation. These results support a need for more empirical studies on the determinants of remittances.

3.1 METHODOLOGY

3.1.1. Basic Model

This paper builds on the model in Funkhouser (1995). A model of remittance behavior considers an emigrant's utility that is a function of his own utility and that of the receiving household in the home country. This study assume a separable utility function given by:

$$(U(U_{pmrh} : U_{rh}) = U_o(C_{pmrh}) + V\{U_{rh}(C_{rh})\, X_{rh}\} \ldots\ldots\ldots\ldots (i)$$

where $U_o > 0$; $U_{rh} > 0$; $U_o < 0$ and $U_{rh} < 0$; ; *pm* refers to a particular migrant and *rh* refers to a specific receiving household, U_o is emigrant *pm* own utility which depends on consumption C_o, U_{rh} refers to the receiving household *rh* utility which depends on its consumption C_{rh} and X_{rh} defines a vector that includes the receiving household characteristics.

The emigrant chooses remittances level to maximize a separable lifetime utility function such as:

$$\sum_t U_o\{C_{pmrh}\}(1/(1+\alpha_u)^t + V\{U(E_{rht} + Rem_{pmrht} + Nhe_{rht}\, \bar{R}em_t),\, X_{rh})\}\{1/(1+\alpha_v)^t\} \ldots\ldots (ii)$$

Subject to

$$C_{pmrh} + Rem_{pmrht} = Iemg \ldots\ldots\ldots\ldots (iiia)$$

$$Iemg_{pmrht} = \mu_0 + D_{pmrht}\, \mu_1 + e_{pmrht} \ldots\ldots\ldots (iiib)$$

where C_{pmrh} is emigrant's consumption at time t, E_{rht} is household income earned by receiving household *rh* in the native country at time t , Rem_{pmrht} refers to remittances received by the receiving household *rh* from migrant *pm* at time t , Nhe_{rht} identifies the number of other household emigrants at time t , $\bar{R}em_{rht}$ quantifies the average remittances per other emigrant at time t, $Iemg_{pmrht}$ is the income of the emigrant *pm* at time t, D_{pmrht} describes a vector of emigrant's characteristics at time

……

t, $(1/(1+\alpha_u)^t$ is a discount rate applied to emigrant utility function. Solving this maximization problem leads to the first order condition for a positive level of remittances at time t:

$$-(U_0)\{(1/(1+\alpha_u)\}^t dRem+\delta V \backslash \delta U_{rh}(U_{rh})\{(1/(1+\alpha_u)\}^t dRem=0 \ldots\ldots\ldots\ldots (iv)$$

Solving for the level of remittances yields an implicit remittance equation

$$R^*em_{pmrht}=Rem(\alpha_u, \alpha_v, D_{pmrht}, E_{rht}, Nhe_{rht}, R\bar{e}m_{rht}) \ldots\ldots\ldots\ldots (v)$$

In a censored regression model equation (v) determines both the probability of remitting and the level of remittances. This study use a linear functional form given by:

$$R^*em=\theta+\mu D+\gamma X+u \ldots\ldots\ldots\ldots (vi)$$

in which D is a vector that includes emigrants' characteristics, X is a vector that consists of household characteristics in the recipient country; and u is a normally distributed error term u ~Nhe$(0,\alpha^2)$. The objective of exploring the determinants of remittances lies in estimating equation (vi). The domain of the dependent variable is censored since the observed remittances are never negative. Remittances are zero for a large number of observations. It can be rewritten equation (vi) to explicitly illustrate this:

$$Rem_{pmrh}=\begin{cases}\theta+\mu D_{pmrh}+\gamma X_{rh}+u_{pmrh} & \text{if and only if } \theta+\mu D_{pmrh}+\gamma X_{rh}+u_{pmrh}>0\\ 0 & \text{otherwise}\end{cases} \ldots\ldots\ldots (vii)$$

such that $pm=1 \ldots\ldots k_{rh}$; and $rh=1 \ldots\ldots RH$ and k_{rh} is the total number of migrants in household *rh* and *RH* is the total number of receiving households.

In a nutshell, to explore the determinants of remittances need to estimate equation (vi). Ordinary least squares yield biased estimates because of the nature of the dependent variable. Two alternative approaches are usually adopted to estimate in equation (vi). The first one is a Heckman (1979) two-step procedure. This method requires that the decision to remit is a two-step decision: the likelihood of remitting and the level of remittances. The second approach is a censored Tobit model. This model assumes that the decision to remit is a one-step decision and therefore requires that all determinants have the same sign effect on the likelihood and the level of remittances. In this paper the second approach is dictated by equation (v) since it determines both the probability of remitting and the level of remittances.

……

3.1.2. Estimation Method

Re-write equation (vi) as the following:

$Rem_{pmrh} = \theta + \mu D_{mprh} + \gamma X_{rh} + u_{mprh} \ldots\ldots\ldots\ldots (viii)$

It take the average of equation by summing over migrants who are remitting within each receiving household with multiple migrants remitting and then dividing by m_{rh}. This leads to equation (ix) which, hereafter, it refer to as the average model:

$$1/m_{rh}\sum_{pm-1}^{m_{rh}} Rem_{pmrh} = (1/m_{rh})Rem = \theta + (1/m_{rh})\mu\sum_{pm-1}^{m_{rh}} D_{mprh} + \gamma X_{rh} + (1/m_{rh})\sum_{pm-1}^{m_{rh}} u_{pmrh} \ldots\ldots\ldots (ix)$$

where Rem_{rh} is the total amount of remittances received by household *rh* from all remitting migrants belonging to household j and is the number of migrants who remit in household rh and m_{rh} is the number of migrants who remit in household *rh*. If the number of remitting migrants is either zero or one then the model follows equation (viii). Otherwise the model is defined by equation (ix). Also, since $u_{pmrh} \sim Nhe(0,\alpha^2)$ then the new error term

$$e_{rh} = +(1/m_{rh})\sum_{pm=1}^{m_{rh}} u_{pmrh}$$ *is not homoscedastic with* $e_{pmrh} \sim Nhe(0,\alpha^2)$*. Therefore, equation (ix)*

Therefore, equation (ix) defines a heteroskedastic Tobit with a known form of heteroskdeasticity. In fact:

$$Vari(e_{rh}) = Vari\{(1/m_{rh})\sum_{pm=1}^{m_{rh}} u_{pmrh}\} = Vari(1/m_{rh})\{u_{1rh} + u_{2rh} + u_{3rh} + \ldots\ldots + um_{rh}rh\} \ldots\ldots (x)$$

Equation (x) holds for all households and can be rewritten as:

$$1/m_{rh}\{CoVari(u_{pmrh}; u_{pmrh}) + 1/m_{rh}(m_{rh}-1)\{CoVari(u_{pmrh}; u_{mrh})\} = (1/m_{rh})\theta^2\{1+(m_{rh}-1)\pi = \theta^2 \ldots\ldots (xi)$$

where *m* is a migrant other than migrant *pm* in household *rh*, $CoVari(u_{pmrh};u_{mrh}) = CoVari(u_{pmrh};u_{mrh})/std(u_{pmrh})^{*}std(u_{mrh}) = \pi$.

The variance of the new error term is a function of the variance of the original model in equation (viii), the number of remitting migrants within a household and the correlation of the error terms of different remitting migrants who belong to the same receiving household.

The correlation coefficient π measures the correlation between u_{pmrh} and u_{mrh}. A positive π suggests that if migrant *pm* remits then migrant *m* also remits and both remittances amounts move in the same direction. This suggests some competition between migrants within the same receiving household. A less aggressive hypothesis proposes that migrants coming from the same receiving household share the same background and behave in a similar manner. If migrant *pm* sees a need to remit then migrant *m* sees the same need and also remits and the latter is conditional on their

abilities to remit. A negative π implies a negative relationship between the error terms of the remitting migrants in the same household. This indirect connection defines a crowding out effect. The fact that migrant *pm* is remitting discourages other migrants in the same receiving household from remitting. This negative relationship might also represent an ex-ante agreement on the remitting behavior between all migrants within the same receiving household. Both of these cases indicate that remitting decisions among migrants belonging to the same receiving household are interdependent. Finally, if π is equal to zero then migrants' decisions to participate in the remitting process are independent.

The coefficients in equation (viii) and (ix) θ, μ and γ, are the same as the coefficients in equation (vi) which insure the same interpretation of the results. It estimate the average model using maximum likelihood estimation. The likelihood function

f_{rh}
$K_{rh}=\sum \text{Ln}K_{pmrh}$ for the average model is the following:
pm=1

$$LnK_{pmrh}=Ln\{1-\chi(D\pi)\}= Ln\{1-\chi(D\mu^{*}\delta)\} \quad if\ m_{rh}=0\ldots\ldots(xii)$$

$$LnK_{pmrh}=0.5^{*}\{Ln(\delta^{2})-(\delta Rem_{pmrh}-D\chi)^{2}\} \quad if\ m_{rh}=1\ldots\ldots(xiii)$$

$$LnK_{pmrh}=0.5^{*}[Ln\{\delta^{2}/p_{rh}+\pi(1-p_{rh})\}-\{1/p_{rh}+\pi(1-p_{rh})\}(\delta Rem_{pmrh}-D\chi)^{2}]\ if\ m_{rh}>1\ldots.(xiv)$$

where $\chi(.)$ is the standard normal cumulative distribution function and δ=μ/ θ; δ=1/ θ. Maximize K_{rh} with respect to χ; μ and δ.

3.2. Data

Data used in this study come from an original survey that this paper implemented in the People's Republic of Bangladesh during the first half of 2005. The sampling and data gathering processes were contracted with a professional surveying organization. The survey was designed to be statistically representative of all regions and localities in Bangladesh and gathered information related to several key elements: socio-demographics; human capital; remittances and migration; and expenditure categories, amounts and locations. The interviews were conducted only with household heads. The interviewer gave the respondent a control ticket at the end of the interview. The questionnaire was programmed in Bengali languages using Computer Assisted Personal Interviewing software. The Bengali translation was based on the English version. The sampling procedure starts by dividing the country in 8 sampling regions based on the country's 64 administrative districts. The total sample includes 1,800 households. The sampling in each region was determined according to the population living in the following categories of localities: municipalities, towns, and villages/communes. The only restriction was to limit the number of interviews to three in one sampling point. In addition, the households were selected based on a

random walk procedure. Keeping the number of interviews per sampling point limited to three, the survey also employed a skip interval procedure between households.

Receiving household members were asked about their age, education, property, income, occupation, businesses and any agricultural activities. This survey includes a remittances model where a knowledgeable member of the receiving household was asked about other household members who do not live in the household. All the information about emigrants is extracted from their primary receiving household. This study have information on their destination, labor force status, age, education, their relationship to the head of the main household and also their year of migration. The remittances module documents 800 migrants in total. Unlike all previous studies have information on the sender and the recipient from the same source, the original receiving household.

One contribution of this paper is that able to track information on both sides of the remittance behavior from the same source. This ability to identify each individual allows to further understand how intra-family decisions are made regarding the allocation of resources across households that are separated by the migration of some of its members (Menjívar 1995). Even with this unique data set it can only precisely recognize the decision to remit of migrants. It cannot identify the exact amount of remittances sent by each migrant. This lack of information causes a problem since it cannot identify the exact amount remitted by each migrant. To avoid this problem it also separate migrants into three categories based on their decision to participate in the remitting process. The first category includes migrants who do not remit such that their remittances are zero. The second category has migrants who remit but also who belong to households with only one migrant remitting (m_{rh} where m_{rh} is the number of remitting migrants in household *rh*). Again we know the exact amount that these migrants are sending. The third category consists of migrants who remit and who belong to multiple remitting migrants' households (m_{rh}). In this last category do not observe the exact amount of remittances for each migrant remitting. Average the total amount of remittances received by the original household on all the migrants who remit.

4.1 DATA ANALYSIS AND DISCUSSIONS

Table 1.1 presents a comparison of characteristics between migrants and non-migrant population. Emigrants tend to be male and more educated and the households they left behind are more likely to reside in urban areas.

Table 1.1 Characteristics of Non-migrant and Migrant Population (percentages)

Description	Non-migrant	Migrants
Age		
21-30	14.1	32.7
Region		
Urban	62.3	44.6
Gender		
Male	56.2	92.4
Education		
Less than 5 years	23.4	25.6
Proportion remitting		67.8
Mean year of migration		6.8
Mean remittances/Month/US Dollar		145.3
Total sample size	1000	800

The average number of years since migration is roughly seven years. The proportion of migrants remitting is 68% and the mean remittance is around US$ 145 per month. The average amount of remittances is almost similar in magnitude to what Funkhouser (1995) found. Table 1.2 presents characteristics of emigrants by destination. The main two destinations for Bangladeshi migrants are Middle East and European Union.

Table 1.2 Characteristics of Migrants by Destination (percentages)

Description	Middle East	European Union
Age		
21-30	36.5	24.6
Region		
Urban	63.6	84.7
Gender		
Male	96.2	91.4
Education		
Less than 5 years	33.5	2.7
Proportion remitting	37.2	22.2
Mean year of migration	4.3	9.1
Mean remittances/Month/US Dollar	45.5	150.2
Total sample size	6000	200

Middle East accounts for 75% share of the Bangladeshi emigrants. European Union accounts for 25%. In Table 1.2 define two main subsets of destinations and include all the developing countries under developing and all the developed countries under developed. Bangladeshi

emigrants' characteristics in developing countries are different from those in developed countries for gender composition. Emigrants in developing countries come from different regions, are less educated and tend to be more in their 20s compared to those in developed countries. The proportion of remitting is by emigrants in developed countries with a 22%. As expected, the average amount remitted per month is higher for migrants living in European Union countries. This number is also higher than the mean of the total sample. This is hardly surprising because in general developed countries offer higher standards of living, higher wages and stronger currency denominations than any other developing country. Living in the U.S. or Canada for example gives emigrants a stronger remitting power which translates into higher levels of remittances. It also stress on the significant difference between the mean years since migration. One plausible explanation is that countries like the U.S. and Canada signal long term migration intentions due to availability of opportunities and more stable economies.

Table 1.3 describes the proportion of migrants remitting by relationship to the head of the receiving household and by groups of migrants. A large portion of emigrants are the offspring of the head of the household. Only about 14% of the emigrants are spouses of the head of the household. Siblings to the head of the household form approximately 11.1% of the total number of emigrants. These groups are ranked by the closeness of the relationship between the migrant and the head of the household from closest to farthest. This ranking also coincides with the ranking of the fraction of emigrants remitting except for the last group, not related, where a surprising 57% remitting. This suppose either a strong friendship or some investment opportunities behind this high proportion.

Table 1.3 Proportion Remitting by Relationship to the Head of the Receiving Household and by Group (percentages)

Description	Percentage	Proportion Remitting
Relationship to the Head of the Receiving Household		
Spouse of the Head	13.7	71.0
Child of the Head	9.7	61.4
Parent of the Head	56.2	59.2
Child in law of the Head	2.4	50.3
Sibling of the of the Household	12.1	44.5
Grandchild of the Head	1.4	37.1
Other Relationship to the Head	2.1	33.3
Not Related to the Head	2.4	57.0
	100.0	
Emigrant Population by Groups		
Working	91.1	96.2
Student	5.9	12.1
Housewife	1.7	57.2
Other	1.3	22.5
Total sample size	6000	200

It also separates the emigrant population into four subgroups. Approximately 91% of emigrants have a job. Around 96% of the working emigrants send money back home. As expected the proportion of students remitting is 12% much smaller than those migrants working. In Table 1.4 discuss the characteristics of the receiving households by number of remitting emigrants per household. Out of 501 households that have at least one migrant living abroad, 71% have at least one migrant remitting. It seems that there is a negative relationship between the number of remitting migrants and the percentage of working head of households.

Table 1.4 Characteristics by Number of Sending Emigrants Aged 14 and up (percentages)

Number of Sending Emigrants per Household	Percentage of Households	Mean Years of Education of the Head of the Household	Percentage Residing in Urban Areas	Percentage Working Head of Household
1	71.2	2.8	61.2	65.3
2	19.8	2.3	71.5	75.1
3	5.2	2.6	60.4	65.7
4	2.0	2.7	65.6	67.1
5 and more	1.8	3.2	62.9	66.7
All households	100.0	2.7	63.4	69.1
Sample Size of Receiving Households				501

The remitting decision stage a migrant's individual characteristics play a major role. This study include migrants' age, gender, level of schooling, employment status, destination, years living abroad and the relationship to the head of the receiving household. Likewise it expect the receiving household's attributes to have an effect on the migrant's remitting decisions. This papper include the receiving household area of residence, the labor status and the years of education of the head of the household.

Table 1.5 outline three model specifications with different subset of independent variables for the average model presented in above. Column (i) shows the maximum likelihood estimates of a heteroskedastic Tobit on both emigrant and receiving household characteristics. Column (ii) includes a set of emigrant's characteristics while column (ii) includes the receiving household's characteristics. Migrant's gender, the labor force status, destination and the relationship to the head of the receiving household all significantly affect the remitting behavior. The education level and the labor status of the head of the household also affect the remitting process.

Table 1.6 Maximum Likelihood Estimates for a Heteroskedastic Tobit

Variables	Amount remitted		
	(i)	(ii)	(iii)
Intercept	-0.54	-2.20	1.88
	(0.63)	(0.51)	(0.39)
Migrant Characteristics			
Age between 21 and 30	0.37	0.23	
	(0.25)	(0.26)	
Male	-0.37	-0.51	
	(0.23)	(0.20)	
Education less than 4 Years	-0.23	-0.39	
	(0.82)	(0.25)	
Years of Migration less than 5	-0.33	-0.25	
	(0.23)	(0.23)	
Working	2.14	2.19	
	(0.23)	(0.37)	
Migrant Resides in a Developed Country	1.13	1.21	
	(0.25)	(0.26)	
Spouse of the Head of the Household	2.11	2.04	
	(0.42)	(0.51)	
Parent of the Head of the Household	1.44	1.60	
	(0.73)	(0.71)	
Child of the Head of the Household	0.74	0.89	
	(0.23)	(0.27)	
Household Characteristics			
Urban Residence	-0.72	-	-0.29
	(0.23)		(0.27)
Education of Household Head less than 5 years	-0.69	-	-1.09
	(0.25)		(0.26)
Head of the Household Working	-0.82	-	1.09
	(0.27)		(1.10)
Log Likelihood	-564.16	-575.03	-614.60
δ	0.35	0.34	0.33
	(0.02)	(0.01)	(0.00)
α	0.28	0.32	0.32
	(0.13)	(0.16)	(0.16)
Sample	551	551	551

One of the contributions of this paper is quantifying the results. Table 1.7 decomposes the heteroskedastic Tobit coefficients into two effects: a change in the probability of remitting and a percentage change in the amount remitted.

Table 1.7 Change in Probability of Remitting Results of Model in Table 1.6

Variables	Average Model	
	Percentage Change in Probability	Percentage Change in Amount
Intercept	-6.82	-18.14
Migrant Characteristics		
Age between 21 and 30	4.46	12.41
Male	-5.97	-15.40
Education less than 4 Years	-3.60	-10.32
Years of Migration less than 5	-3.47	-10.11
Working	9.14	90.3
Migrant Resides in a Developed Country	17.25	46.1
Spouse of the Head of the Household	28.11	62.88
Parent of the Head of the Household	11.12	43.31
Child of the Head of the Household	10.33	29.32
Household Characteristics		
Urban Residence	-8.82	-23.22
Education of Household Head less than 5 years	-9.90	-23.45
Head of the Household Working	-12.40	-31.65

Male migrants are less likely to remit. The probability of remitting decreases by around 6% for male migrants. These findings strengthen the belief of gender differences in the remitting behavior. Migrants who have a job are almost 9% more likely to remit than those who are not working. Also the percentage change in the level of remittances is a large increase of 90% for working migrants. Living in European Union region increases both the probability (17%) and the percentage change in the amount of remittances (46%). The labor status and the destination of the migrant seem to have a significant role in the remitting behavior for Bangladeshi. Together they shape the remitting ability of migrants. The probability and amount of remittances increase for migrants belonging to the nuclear family. The increase in the probability and the amount is the largest for the migrants who are the spouse or the parent compared to migrants who are the child of the head of the household. The difference in these magnitudes is most likely explained by the responsibility that spouses and parents share toward the receiving household. Spouses and parents share the responsibility of providing for the receiving household while this responsibility is not that evident for child migrants. Also the large difference of the percent change in the amount between a migrant spouse and a migrant parent strengthens this hypothesis since it also illustrates the difference between the roles of parents and spouses (Menjívar et al. 1998).

From the household characteristics, the likelihood of remitting and the percentage change in the amount remitted decrease for migrants belonging to a receiving household with a head of household who reports less than four years of education. The same results apply for receiving households with a working head. A working head of the receiving household signals a stable source of income and possibly less need for financial help.

The main contribution of the paper is quantifying the interaction among remitters within the same receiving household. Social interactions and decision making are topics of huge interests for

economists. In fact, the literature on the interaction among members of the same household is extensive (Becker 1974; Bergstorm 1989). However, no paper has extended this literature into the theory of migrant remittance behavior. This paper measure the remittance behavior between migrants belonging to the same household. The correlation coefficient α is positive for all three regressions. This coefficient is significantly different from zero at the 5% significance level and is around 0.32 for two of the three regressions. In order to measure α with more precision re-estimate the average model with fewer controls.

Table 1.8 present six different specifications. For instance, column (i) includes the labor status of the migrant while column (ii) represents the average model controlling for migrant's destination. The correlation coefficient is significant at the 1 percent significance level for five of the six cases and in all these cases the estimates of α are greater than the ones presented in Table 1.6. Column (vi) includes no controls and estimates α to be around 0.43. Here refer to this value as the benchmark value.

Table 1.8 A Heteroskedastic Tobit Average Model of the Amount Remitted by Emigrants

Variables	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v)**	**(vi)**
Intercept	-1.56	-0.19	0.15	0.04	0.18	0.18
	(0.27)	(0.22)	(0.19)	(0.19)	(0.10)	(0.19)
Working	2.21					
	(0.25)					
Migrant Resides in a Developed Country		1.37				
		(0.25)				
Spouse of the Head of the Household			0.83			
			(0.68)			
Parent of the Head of the Household				1.79		
				(0.49)		
Child of the Head of the Household					-1.14	
					(0.35)	
Log Likelihood	-607.30	-614.70	-624.42	-624.42	-627.86	-639.80
δ	0.22	0.23	0.21	0.22	0.21	0.21
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
α	0.34	0.22	0.36	0.48	0.40	0.43
	(0.15)	(0.15)	(0.15)	(0.18)	(0.16)	(0.16)
Sample	551	551	551	551	551	551

The remitting decision of migrant i seems to be directly related to the remitting decision of migrant taken into consideration that both migrants belong to the same receiving household's. One can say that migrants within the same receiving households compete through remittances. If migrant i remit then migrant remits and remits more migrants compete to get the attention of the receiving household's. Another hypothesis proposes that migrants belonging to the same receiving household share the same background and therefore behave in the same manner. Also one can think of an ex-ante agreement hypothesis between migrants. Migrants agree on a predetermined schedule of remitting.

The relationship of the migrant to the head of the receiving household is not necessarily the same for all migrants. The difference in the relationship to the head of the household can define a different association with the receiving household and therefore a different approach towards remitting. This study test this suggestion by pooling on all migrants who are children of the head of the household. Migrants who are children of the head of the household represent the largest group of emigrants.

Table 1.9 Migrant Remitting Decisions among Different Samples

Variables	Children	Children and Working	Children and living in Middle East	Children and living in European Union
Intercept	0.33	0.83	0.15	0.71
	(0.12)	(0.11)	(0.29)	(0.22)
Log Likelihood	-348.83	-284.51	-190.56	-124.43
δ	0.23	0.02	0.25	0.34
	(0.01)	(0.24)	(0.01)	(0.15)
α	0.40	0.14	0.69	0.34
	(0.11)	(0.15)	(0.24)	(0.15)
Sample	306	156	137	201

Above, Table 1.9 illustrates four equations with different sub-samples and no controls. The first column includes migrants who are the children of the head of the household. The other columns add more restrictions on the children sample by labor status and destination. The correlation coefficient estimates do not differ much from the benchmark value except for the migrants who are children and living in Middle East. The estimate of α captures the highest correlation (0.69) in the remitting decisions among migrants living in Middle East and who are siblings. The high correlation estimate might be explained by the fact that many Bangladeshi's migrate to Middle East to work in the coffee harvest and share the same remitting behavior.

5.1. CONCLUSION

This paper examines the remitting behavior of Bangladeshi's. It presents three contributions: a unique data set, quantifying the correlation of the remitting decisions and calculating the changes in the likelihood and amount of remittances. It use a unique survey data where have information on the sender and the receiver from the same source. This study estimate a heteroskedastic Tobit with a known form of heteroskedasticity to capture both the probability of remitting and the levels of remittances. Gender, labor force status and destination of the migrant along with the nuclear family all have significant effects on the remitting behavior. The labor force status and the education level of the head of the receiving household influence the migrant's decision to participate in the remitting behavior. From policy perspective, it seems that foreign migration policies are likely to have significant effects on remittances to Bangladesh since these policies are likely to affect the destination of Bangladeshi migrants. Also any economic shocks in the destination countries affect the remittance process in Bangladesh by affecting the labor status of the Bangladeshi migrant. On

the other hand, domestic policies that affect the composition of the migrant pool through gender, receiving household characteristics and even the relationship of the migrant to the head of the household are also likely to affect the amount of remittances sent back to Bangladesh.

In addition, migrants belonging to the same receiving household seem to make decisions concerning remittances in accordance with other migrants in the same household. The article find evidence supporting a positive correlation between migrants' remitting decisions. For policy makers this is of great significance. Remittance policies that directly target particular migrants are also expected to affect the remittance decisions of other migrants belonging to the same receiving household. The full effect of such policies can be separated into direct effect through the main policy objective and an indirect effect through the significant correlation between the remitting decisions. Also, this direct correlation introduces a set of hypotheses on the remitting decisions. Migrants within the same receiving household might be competing, behaving in the same manner based on their shared background or simply implementing an ex-ante agreement. It is not very clear from the results in this paper which model of household behavior is supported (Browning & Chiappori 1998). Also it is not obvious whether the remitting decisions of migrants belonging to the same receiving household should be modeled as a cooperative process. More evidence from other data sets is needed in order to investigate this set of hypotheses. This approach forms the next step in this line of research.

REFERENCES

Amuedo-Dorantes, C., & Pozo, S. (2004). Worker's Remittances and the Real Exchange Rate: Paradox of Gifts. World Development, 32 (8), 1407–1417.

Becker, G. (1974). A Theory of Social Interactions. Journal of Political Economy, 82 (6), 1063–1093.

Bergstorm, T. (1989). A Fresh Look at the Rotten Kid Theorem--and Other Households Mysteries. Journal of Political Economy, 97 (5), 1138–1159.

Browning, M. & Chiappori, P.A. (1998). Efficient Intra-Household Allocations: A General Characterization and Empirical Tests. Econometrica, 66 (6), 1241–1278.

Chami, R., Cosimano, T., & Gapen, M. (2006). Beware of Emigrants Bearing Gifts: Optimal Fiscal and Monetary Policy in the Presence of Remittances. IMF-Working Paper WP/06/61.

Chami, R., Fullenkamp, C., & Jahjah, S. (2003). Are Immigrant Remittance Flows a Source of Capital for Development? IMF-Working Paper, WP/03/189.

Connell, J., & Brown, R. (2004). The remittances of Migrant Tongan and Samoan Nurses from Australia. Human Resources for Health, 2 (2), 1–45.

De Haas, H. (2006). Migration, Remittances and Regional Development in Southern Morocco. Geoforum, 37 (4), 565–580.

Edwards, A., & Ureta, M. (2003). International Migration, Remittances and Schooling: Evidence from El-Salvador. Journal of Development Economics, 72 (2), 429–461.

Funkhouser, E. (1992). Migration from Nicaragua: Some Recent Evidence. World Development, 20 (8), 1209–1218.

Glytsos, N. (2002). The Role of Migrant Remittances in Development: Evidence from Mediterranean Countries. International Migration, 40 (1), 5–26.

Heilmann, C. (2006). Remittances and the Migration-Development Nexus-Challenges for the Sustainable Governance of Migration. Ecological Economics, 59 (2), 231–236.

Knowles, J., & Anker, L. (1981). An Analysis of Income Transfers in a Developing Country: The Case of Kenya. Journal of Development Economics, 8 (2), 205–226.

Lianos, T.P. (1997). Factors Determining Migrant Remittances: The Case of Greece. International Migration Review, 31 (1), 72–87.

Lucas, R., & Stark, O. (1985). Motivations to Remit: Evidence from Botswana. Journal of Political Economy, 93 (5), 901–918.

Mannan, K. A., & Wei, G. K. (2006). International Remittances, Household Spending, and Investment: A Case Study Of Bangladesh. Asian Migration and Diaspora Studies, 12(2), 36-54.

Mannan, K. A., & Kozlov, V. V. (2005). The Impact of Remittances on Labour Force in Bangladesh: An Empirical Analysis of Labour Participation and Employment. Russian Management Journal, 16(2), 51-74.

Mannan, K. A., & Krueger, A. O. (2004). The Impact of Remittances on Household: An Empirical Study on the Bangladeshi Diaspora in United Kingdom. Russian Journal of Economic and Social Science, 12(2), 48-74.

Mannan, K. A., & Kozlov, V. V. (2003). Bangladeshi Migrants in Italy: An Analysis of Survival Strategies and Job Segmentations. Russian Management Journal, 14(2), 37-57.

Mannan, K. A., & Krueger, A. O. (2002). Why do Italy? A Comparative Analysis of Bangladeshi Migrants into Five European Countries. Russian Journal of Economic and Social Science, 10(2), 30-48.

Mannan, K. A., & Kozlov, V. V. (2001). The Cost-Benefit Analysis of International Migration: Modelling and Empirical Study between Bangladesh and Italy. Russian Management Journal, 12(2), 29-52.

Mannan, K. A., & Krueger, A. O. (2000). The Dynamics of International Migration: A Three Step Empirical Model of Bangladeshi Migrants in Italy. Russian Journal of Economic and Social Science, 8(2), 34-58.

Menjívar, C., DaVanzo, J., Greenwell, L., & Burciaga V. R. (1998). Remittance Behavior among Salvadoran and Filipino Immigrants in Los Angeles. International Migration Review, 32 (1), 97–126.

Menjívar, C. (1995). Immigrant Social Networks: Implications and Lessons for Policy. Harvard Journal of Hispanic Policy, 8, 35–59.

Oberai, A.S., & Singh, K. M. (1980). Migration, Remittances and Rural Development: Findings of a Case Study in the Indian Punjab. International Labour Review, 119 (2), 229–241.

Rodriguez, E.R. (1996). International Migrant's Remittances in the Philippines. Canadian Journal of Economics. 29 (2), S427–S432.

World Bank's Global Economic Prospects Accessed August 2007 www.worldbank.org/prospects/gep2005.