The New Economics of Labour Migration (NELM):Econometric Analysis of Remittances from Italy to Rural Bangladesh Based on Kinship Relation

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The New Economics of Labour Migration (NELM): Econometric Analysis of Remittances from Italy to Rural Bangladesh Based on Kinship Relation

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Abstract

This paper analysed the household head relation to the migrant and remittances determinants among ten villages on the remittances receiving households in rural Bangladesh. The household survey data from Bangladesh for the period of July to December, 2013, to analyse determinants of remittances at the left behind household members. Rather than multilevel models, use a three stages backward regressions elimination estimation process and build up econometric best fit model of remittances, which helps us the focus the analysis on the explanation of remittances determinants heterogeneity in micro-economic level of studies. The empirical findings suggest that the household head relation to the migrant is one of the strong determinants of remittances as well as other variables. In addition, the household head relation to migrant such a father, mother, brother and wife also have different influential factors while the most common variable as number of visit by the migrant at the origin is strongly associates with all the relationship to the migrant although level of significance has slightly discrimination. Overall, the findings suggests that the age of migrant are strongly associates with father, wife and brother relation of the household head while the age of household head as father and wife. The investment in housing development strongly associates wife, brother and mother household head whereas household living expenses with father and wife. Individual determinants such as household income, land and marital status of the migrant are strongly associates with father, wife and mother household head respectively.

Index Terms –migration, remittance, household head, father, mother, wife, brother, rural household

JEL classification: A12, B21, C51, C81, D19, J19, R23

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1. Introduction

According to the International Organization for Migration (IOM), there are an accounted 191 million global migrants in 2005, up from 176 million in 2000. Migrants include 3.0 per cent of the worldwide population. For the period 2000-10, the world migrant stock increased double as fast than during the last decade. In 1990s, the global migrant stock increased at an average of about 2 million migrants per year. During the period 2000-10, the outgrowth in the migrant stock accelerated to about 4.6 million migrants annually. There are 232 million international migrants are staying in the world today (Mannan and Farhana, 2014b). Since 1990, the number of international migrants in the global North grew by about 53 million (65%), on the other hand the migrant population in the global South increased by about 24 million (34%). Nowadays, around six out of every ten international migrants stay in the developed nations (UN, 2013).

In 2006, remittance flows are accounted to have go beyond USD 276 billion globally, USD 206 billion of which sent to developing countries. According to World Bank database (2014), the global remittance flow, which has touched $550 billion last year, is expected to grow by 8 per cent per annum in the next few of years. Of the total remittance fund, $414 billion were received by developing countries, especially Bangladesh, China, India, Mexico, the Philippines, and Pakistan.

Bangladeshi migrants in Italy are predominantly single and male migrants who are living under 'transnationally split' (Yeoh, Graham, and Boyle, 2002) conditions and obligated to maintain economic and social relations with their family members back home (Rahman and Kabir, 2012). The obligation of maintaining sustained economic and social ties with home stems from the dominance of the household in the social and economic affairs of the Bangladeshi society and their transnational household members. Individual migrant is deeply enmeshed in a complex web of household relations and dependencies: He/she moves internationally for work as an envoy of the extended household that places the well-being of the extended family above the individual migrant's interests (Rahman, 2011). Whether it is temporary labour migration such as migration to the Middle East or more permanent form of migration such as migration to Italy, maintaining sustained economic relations with left behind households remain one of the key priorities for migrant members (Ullah, 2010, Rahman 2009). This is comprehensive evidenced in the annual inflow of remittances to Bangladesh, which has increased from around $4.2 billion in 2005 to nearly $10.9 billion in 2013 (BMET, 2014).

According to the World Bank (2014) 'remittances to developing countries are estimated at $404 billion in 2013, up 3.5 percent compared with 2012. Growth in remittance flows to developing countries is expected to accelerate to an annual average of 8.4 percent over the next three years, raising flows to $436 billion in 2014 and $516 billion in 2016'. These facts and figures indicate that international migration and remittance is an intricate phenomenon, the dynamics of which are increasingly turning a drastic policy topic global economic, social, legal and cultural topic (Mannan and Farhana, 2014a).

2. Literature review on migration and remittances

2.1 Theory: The New Economics of Labour Migration (NELM)

This theory dealt with household and household considers as a single unit in the light of this theory. This single unit of household is use in the analysis for migration. The individual migrant worker considers a subset of the household. The costs and benefits of the migration decision shares with migrant and his whole household. The individual migrant is part of the beneficial contract of the household members (Stark and Bloom, 1985). Household benefits from the income generate from different sources. This phenomenon became a form of coinsurance. This theory does not reduce the importance of individual activity in decision-making for migration. The actions and performances of individuals could be explained in the framework of decision-making unit with his whole household (Stark, 1991). This theory has established a unique relation with analytical approach of migration from an economic perspective and the more sociological view in which human behaviour has been examined. Therefore, remittances among household are integral to migration under the new economics of labour migration (NELM). Following below figure 1.1 show the mechanisms of the theory of New Economics of Labour Migration.

Figure 1.1: The New Economics of Labour Migration (NELM) mechanisms
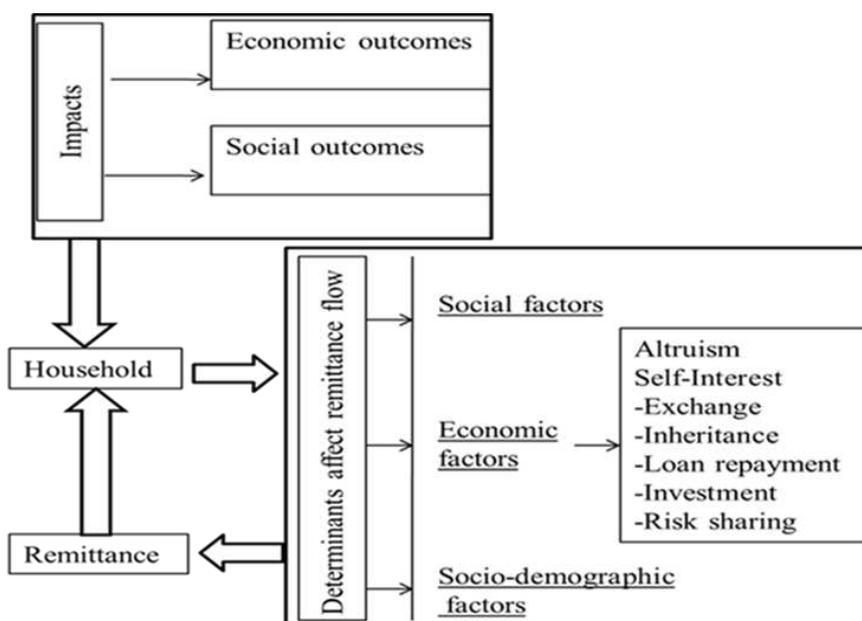
Source: Developed for this study

2.2 Empirical findings

According to Schrieder and Knerr (2000) international remittances defines as the part of international migrants incomes send back from the destination country to the origin country and where the remitter indirectly compensate by a counter of goods and services. However, Van Doorn (2001) explains that such remittances includes in kind as the migrant usually send in cash to their left behind household members as well communities at the origin country. Moreover, Levitt (2001) explains that international remittances have implications in social capital, concepts, ideas, practices and identities from destination country to the originating place which may impact household economic, political, race, class, gender, relationship and also religion involvement.

The empirical literature on international migration reveal wide ranges of macro and micro economic context such as Walsh (1974) explores the determinants of Irish migration to United Kingdom. Davis and Stecklov (2002) explain the impact of rural migration upon the Mexican economy by employing the data from the rural areas of Mexico. Garip (2006) shows that the determinants of migration and remittance are gender, level of education, employment status and migration experience. Poveda (2007) analyse the determinants of rural migration in Mexico. Atamanov and Berg (2012) describe the heterogeneous impact of international migration and Remittances of Kyrgyz Republic. Recently, Sprenger (2013) provides that the demographic characteristics of the migrants significant with origin countries such as young migrant positively relate while education and gender show negative relationship to the migration flows. Moreover, Schiopu, and Siegfried (2006) reveal that the average amount of remittances reduces due to large number of unskilled worker in the country because these workers have lower wages to send remittances to their countries.

The empirical studies on international remittances reveal wide ranges micro-economic context such as Lucas and Stark (1985) explore the statistical evidence on determinants of remittances in terms of motivation to remit to the rural households. However, Adams (1989), reveal that age, marital status, employment status, size of land and gender in terms of number of household male member above 13 years old are the determinants of migration and remittances. In addition, Hoddinott (1994), finds out that household and migrant characteristics influence the migration decision therefore remittances flow partly depend on parent and household land while son migrant and the remittances determinants always dynamics which may vary from household to household, migrant to migrant, geographical location so on.

Recently, Brown (1997) explores that the motivational group of variables such as altruism, intent to return, inheritance, household land, business investment, household head level of education and implicit coinsurance significance to remit to the left behind household at the origin. However, the level of significance differs from each origin. While Cox et al (1998) find that the strong remittance determinant is altruism while consistent with exchange. Agrawal and Horowitz (1999) indicate that the significance difference between the single and multiple migrant member at the household. de la Briere et al (2002) reveal that due to heterogeneous characteristics of household migrants follow by destination, household composition and gender contradicts in the causes to remit to the left behind household members at the origin. Blue

(2004) clearly argue that the relation to migrant and household head strong remittance determinant and the relationship shows mainly parent, children and siblings.

According to de Hass (2006) international migration and remittances positive relationship to the home country economic development improve household standard of living and increase freedom of dominant cultural groups. However, Markova and Reilly (2007) finds that the strong relationship between migrant legal status and remittances as illegal migrant substantially volume of remittance less than those documented. Kelly and Solomon (2009) show that the religion an important factor of remit to the origin. It vary from between two religion as well as practices of the own religion. Sackey (2010) finds that the length of stay of the migrant at the host country and household size at the origin country statistically significant. Mishra (2011) shows that inheritance, and intention return home highly significant. McDonald and Valenzuela (2012) explore that altruism motive, gender and employment status are factors of remittance but these depend on their overseas earning opportunities and capacities. Busetta et al (2013) show that duration of migration and household composition key determinants of remittances.

After independence in 1971 of Bangladesh, new economy tried to survive the country from overseas income as remittance. Historically, initial stage, political migration to Germany and economic migration to Middle East, therefore migration and remittance literature has been growing early 1980s in Bangladesh. So far, the oldest study of remittance in Bangladesh Habibullah (1980), suggests to the policy maker as taxes can be imposed on conditional terms depending upon the mode of use of the remittance amount and setting up of a specialised organisation to look after investment opportunities of the said remittances. After 25 years, policy maker take few initiatives which yet to be reviled. Furthermore, micro and macro level study require as remittances play pivotal role in Bangladesh present economy.

However, Stahl and Habib (1989), revel that only a little share of remittances are straight way used up on investment goods, non-productive use and strong linkages with the .other economy of the country. A comprehensive study (Murshed et al., 2002) provides the descriptive statistics of the socio-economic characteristics vary within the region, household. Recently, Rahman (2007) finds a precise decline of the migrant households dependent on remittances for basic and secondary living expenses respectively. Barua et al (2007) find that income differential between origin and destination country positively relates with the inflow of remittances. Ullah (2007) compares the socio-demographic characteristics of the migrants between the two countries and shows that there is a small variation such as gender ratio, educational attainment and religion. Rahman and Kabir (2012) explore the migration process occur three distinctive way such as opportunistic, recruitment (formal and informal) and family reunion. Italy for Bangladeshi migrant mainly male dominates where female migrations process either family reunion or as spouse as for dependent category.

3. Data and Sampling

3.1 Source and Sampling

The primary data was collected from households in the Naria Upazila of Shariatpur District in Bangladesh during the period of July to December, 2013. In the second phase, first-hand knowledge of the migrant-sending households was obtained by asking a single question (of whether the household had members who had worked in Italy or not) of each of the 4013 households in the 10 study villages. Thereafter, a structured questionnaire was prepared comprising several open and closed ended questions relevant to the research objectives. . The respondents were the heads of households or senior household members.

In selecting a representative sample of the population, Krejcie and Morgan's (1970) recommendation was accepted in this study. After categorising the households with migrant members in Italy), a random sample of 300 households was selected. Finally the interviews of selected households were administered with structured questionnaires. As many questions as possible were pre-coded to save time during the data collection, processing and analysis. The data were subsequently entered into SPSS version 16.0 for the analysis.

3.2 Research Ethics

For this research, ethical issues concerned three parties – the researcher, participants and Southern Cross University with each party having certain rights and obligations to other parties. On his part, the researcher maintained objectivity, presented honest and true research findings and obtained the approval of the Human Research Ethics Committee of Southern Cross University (Approval Number ECN-13-141 before commencing the primary data collection activities.

4. Econometric Model Building

The econometric model has been developed in the Equation 1.1 has been regressed to observe the association between household yearly remittances received and the exploratory determinant variables. To build up good fit model, variable reduction was undertaking through a process of 'backward elimination' which starts by including all potential variables and assessing their statistical significance one by one and discarding those which are highly non-significant. The backward process were undertaking three stages to build up best fit model and determine the key determinants of remittances of the study area.

Before starting the 'backward elimination' approach (Hocking, 1976), it is essential to check whether the collected data satisfy some fundamental statistical assumptions to justify the selection of the best fit model. For the cross sectional data used in this study, the following three are considered important-normality, multicollinearity and autocorrelation because, as Gujarati (2003) states, not all assumptions are applicable for every type of data.

In constructing a complete model, twenty three variables for tentative model as follows:

$$RmY = \alpha + \alpha_1\,AGEm + \alpha_2\,EDUm + \alpha_3\,MARSm + \alpha_4\,YMIGm + \alpha_5\,LEGSm + \alpha_6\,NVISTm + \alpha_7\,AGEhh +$$

$$\alpha_8\,GENhh + \alpha_9\,MARShh + \alpha_{10}\,EDUhh + \alpha_{11}\,RELhh + \alpha_{12}\,EMPShh + \alpha_{13}\,RELMhh + \alpha_{14}\,HHsize +$$

$$\alpha_{15}\,HLOWtitle + \alpha_{16}\,Invest\_Fin\_Sec + \alpha_{17}\,Invest\_Hous\_Dev + \alpha_{18}\,Ln\_Live\_Exp +$$

$$\alpha_{19}\,Ln\_HH\_Incom + \alpha_{20}\,Inest\_Busi + \alpha_{21}\,Ln\_Welf + \alpha_{22}\,Loan\_Rep + e1 \;\text{-----}(1.1)$$

Multicolliearity represents a state of linear relationships existing among some or all the predictor variables in a regression model. It occurs when explanatory variables in the model are highly correlated to each other. Testing multicollinearity is important for model specification and is considered in this study.

The results in the proposed model would support the classical assumption of multicollinearity, for the high R2 value (.611) and 10 variables (YMIGm, LEGSm, HLOWtitle, HHsize, EDUm, Ln_HH_Incom, RELhh, Ln_Welf_EDUhh and Loan_Rep) are statistically insignificant in the first model of 13 variables.

Since the classical symptom of multicollinearity –'high R2 but few significant t ratios'-are found in the first model, clarification is needed of the statistical problem by observing the variance and covariance of the regression estimators. Gujarati (2003) states, 'the OLS estimators and standard error can be sensitive to even the smallest change the data' The increase of variance and covariance of coefficients are falsified and that can be observed with 'variance-inflating factor (VIF)' and 'tolerance (TOL)' also in model result.

The rule-of-thumb states that the closer the value of TOL and VIF is to 1, the greater the evidence that one explanatory variable is not collinear with the other explanatory variable (Gujarati 2003). The values of Tolerance (TOL) and VIF in the second model indicate that there is no multicollinearity existing among the repressors (explanatory variables).

As stated earlier, the variables are considered for removal sequentially based on their statistically non-significant p value in the equations. The elimination process has begun by laying aside the variable YMIGm having the highest p value (.909), from the first model. This procedure is continued until a best fit model for the explanatory variables has been found. The ultimate outcome is the first best fit model which represents an equation as follows:

$$RmY = \alpha + \alpha_1\,AGEm + \alpha_2\,MARSm + \alpha_3\,NVISTm + \alpha_4\,AGEhh + \alpha_5\,GENhh + \alpha_6\,MARShh + \alpha_7\,EMPShh + \alpha_8\,RELMhh +$$

$$\alpha_9\,Inest\_Fin\_Sec + \alpha_{10}\,Invest\_Hous\_Sec + \alpha_{11}\,Ln\_Land + \alpha_{12}\,Ln\_Live\_Exp + \alpha_1\,Invest\_Busi + e1 \dots\dots\dots\dots(1.2)$$

However, equation 1.2 results indicate in the second model that R2 slightly decreased from the first model to second model with 13 explanatory variables. This was expected as increasing the number of variable increase the value of R2 and vice versa. In this stage, the 'p' value of Invest_Busi and Invest_Fin_Sec two explanatory variables shows statistically insignificant. Therefore, further backward elimination process has been taken to towards the best fit model. The elimination process has begun by laying aside the variable Invest_Busi having the highest

p value from the second model. This procedure is continued until a best fit model for the explanatory variables has been found. The ultimate outcome is the best fit model which represents an equation as follows:

$$RmY= \alpha + \alpha_1\,AGEm + \alpha_2\,MARSm + \alpha_3\,NVISTm + \alpha_4\,AGEhh + \alpha_5\,GENhh + \alpha_6\,MARShh + \alpha_7\,EMPShh +$$

$$\alpha_8\,RELMhh + \alpha_9\,Invest\_Hous\_Sec + \alpha_{10}\,Ln\_Land + \alpha_{11}\,Ln\_Live\_Exp + e1 \dots\dots\dots\dots(1.3)$$

The identification of all these variables are given in the Appendix-I with the exception of the error terms e1 and $\pi1$ which satisfy the assumptions of-

(i) zero mean, $E(e1)=0$; $E(\pi1)=0$

(ii) constant variance, $E(e1)2=\partial e2$; $E(\pi1)2=\partial\pi2$

(iii) no autocorrelation exist in the error e1 and $\pi1$; $E(e1j)=0$ and $E(\pi1j)=0$; where $1\neq j$

5. Empirical results

5.1 Descriptive Analysis

5.1.1 The amount of remittance

The 300 household respondents were asked about the yearly amount of remittances received by them from Italy of their household migrant member. Table 1.1 explores that the yearly amount of remittance were twelve ranges. The maximum and minimum ranges were BDT 14,00,001-15,00,000 and 1,00,001-2,00,000 respectively. The majority 22.0% were sent at the range of BDT 5,00,001-6,00,000 and the 3% highest range BDT 14,00,001-15,00,000 while 12% minimum range BDT 1,00,001-2,00,000. The results indicated that the factor influences to send remittance to their left behind household members in rural Bangladesh.

Table 1.1: Yearly remittance frequency

Yearly Remittance range (BDT)	Frequency	Percentage
100,001-200,000	36	12.0
200,001-300,000	36	12.0
300,001-400,000	18	6.0
400,001-500,000	18	6.0
500,001-600,000	66	22.0
600,001-700,000	48	16.0
700,001-800,000	45	15.0
800,001-900,000	3	1.0
900,001-1000,000	9	3.0
1100,001-1200,000	15	5.0
1300,001-1400,000	3	1.0
1400,001-1500,000	3	1.0
Total	300	100.0

Source: Author calculation from the survey data

5.1.2 Household head relation to migrant and remittances

The cross tabulation of the household participants survey response about the remittance receiver household head relation to the migrant and remittance indicates in the table 1.2 and the results showed that the majority (43.0%) household head were father, 32% wife, 15% mother and 10% brother. All relation to the migrants were received various ranges of remittances. The 3% of wife were received the highest range of remittances BDT 14,00,001 to 15,00,000, 3 % of mother BDT11,00,001-12,00,000, 3% father BDT 9,00,001-10,00,000, and 6% brother BDT 7,00,001 to 8,00,000. It also shows that the father relation to migrant household like receive highest percentage of remittances.

Table 1.2: Cross Tabulation Household yearly remittance received and their relation to household head

Household yearly remittance received (BDT)	Household Head Relation to Migrant				Total
	Father	Mother	Wife	Brother	
1,00,001-2,00,000	21	6	6	3	36
2,00,001-3,00,000	9	12	9	6	36
3,00,001-4,00,000	9	3	6	0	18
4,00,001-5,00,000	6	0	12	0	18
5,00,001-6,00,000	33	15	12	6	66
6,00,001-7,00,000	24	6	9	9	48
7,00,001-800,000	21	0	18	6	45
8,00,001-900,000	3	0	0	0	3
9,00,001-10,00,000	3	0	6	0	9
11,00,001-12,00,000	0	3	12	0	15
13,00,001-14,00,000	0	0	3	0	3
14,00,001-15,00,000	0	0	3	0	3
Total	129	45	96	30	300
% of Total	43.0%	15.0%	32.0%	10.0%	100.0%

Source: Author calculation from the survey data

However, as depicted in the figure 1.2 also indicates that father relation to the migrant household head highest (2%) remittances range BDT 9,00,001 to 10, 00,000 and maximum percentage (26%) father relation to the migrant household head were received BDT 500,001 to 600,000 yearly remittances from their migrant son at the destination.

Figure 1.2: Distribution of father relation to migrant remittance receiving household head
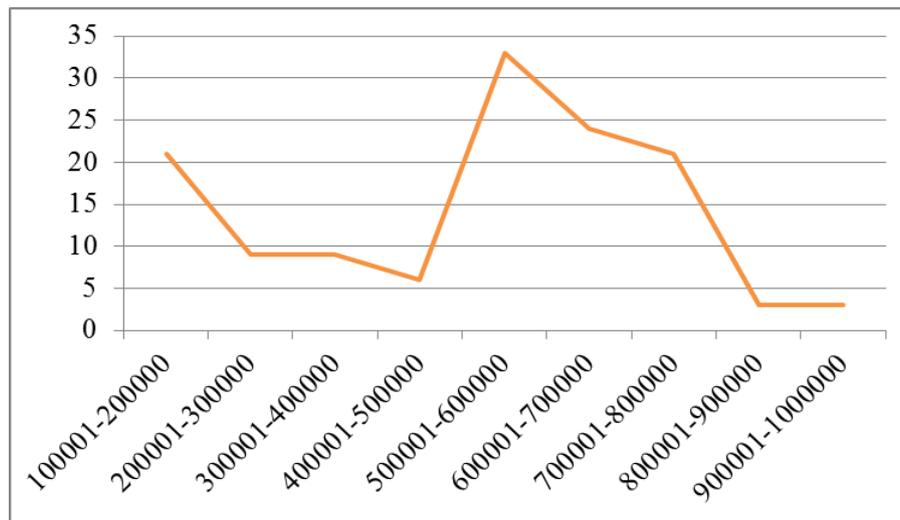
Source: Author calculation from the survey data

5.2 Multivariate analysis

5.2.1 Unit analysis of household head relation to migrant

Table 1.2 explored the household relation of the Bangladeshi migrant in Italy were four relationship such as father, mother, wife and brother. The full regression model at the table 1.3 showed the significance level at .006.

Table 1.3: Regression results of the full model

Determinants	Dependent variable					Collinearity Statistics	
	Household yearly remittance received (RmY)						
	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value	Tolerance	VIF
AGEm	-.498	.149	-.300	-3.341	.001	.248	4.030
EDUm	.049	.166	.019	.297	.767	.506	1.976
MARSm	-.820	.339	-.160	-2.424	.016	.458	2.185
YMIGm	.035	.301	.010	.115	.909	.270	3.703
LEGSm	-.084	.547	-.012	-.153	.878	.328	3.051
NVISTm	.398	.094	.368	4.239	.000	.264	3.781
AGEhh	.417	.102	.445	4.113	.000	.170	5.867
GENhh	2.427	.812	.432	2.988	.003	.096	10.455
MARShh	3.798	.775	.416	4.899	.000	.277	3.611
EDUhh	.101	.130	.052	.779	.437	.445	2.247
RELhh	.502	.494	.095	1.016	.311	.229	4.375
EMPShh	-.299	.093	-.404	-3.222	.001	.127	7.861
RELMhh	.601	.218	.275	2.763	.006	.202	4.950
HHsize	.018	.089	.011	.205	.838	.689	1.451
HLOWNtitle	.044	.234	.013	.186	.853	.396	2.523
Invest_Fin_Sec	.266	.158	.110	1.683	.094	.471	2.124
Invest_Hous_Dev	2.021	.436	.365	4.632	.000	.322	3.108
Ln_Land	.342	.194	.152	1.757	.080	.266	3.764
Ln_Live_Exp	2.693	.767	.325	3.511	.001	.233	4.290
Ln_HH_Incom	-.193	.300	-.092	-.643	.521	.098	10.215
Invest_Busi	.243	.096	.151	2.535	.012	.563	1.775
Ln_WelF	.534	.644	.066	.829	.408	.318	3.146
Loan_Rep	-.810	.482	-.083	-1.680	.095	.809	1.235
Intercept							-46.141
R^2							.611
Adjusted R^2							.565
F-statistic							13.294
Sum squared residual							536.164
Durbin-Watson statistics (d)							1.891

Source: Author calculation from the survey data

However, the model fit (Table 1.4) showed the significance level .000. Therefore, the best fit model supported that the strong relationship between the household relation to the migrant and remittances inflows. The study intended to delve out the difference among the household relation to the migrant with other variables. Hence, the sample broken into different sub-samples as follows:

Table 1.4: Model fit regression results

Determinants	Dependent variable					Collinearity Statistics	
	Household yearly remittance received (RmY)						
	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value	Tolerance	VIF
AGEm	-.473	.100	-.268	-4.718	.000	.380	2.632
MARSm	-.470	.278	-.076	-1.692	.092	.606	1.650
NVISTm	.518	.054	.500	9.559	.000	.447	2.238
AGEhh	.400	.080	.414	4.993	.000	.177	5.634
GENhh	3.542	.469	.630	7.556	.000	.176	5.681
MARShh	2.686	.476	.332	5.639	.000	.353	2.837
EMPShh	-.039	.023	-.062	-1.681	.094	.888	1.126
RELMhh	.615	.158	.234	3.896	.000	.338	2.959
Invest_Hous_Dev	1.668	.283	.277	5.890	.000	.552	1.812
Ln_Land	.180	.097	.070	1.857	.064	.854	1.171
Ln_Live_Exp	1.779	.345	.218	5.151	.000	.684	1.462
Intercept							-31.763
R^2							.648
Adjusted R^2							.634
F-statistic							48.146
Sum squared residual							832.331
Durbin-Watson statistics (d)							2.049

Source: Author calculation from the survey data

5.2.1 Father as a household head

The long and short regression results explored the following table 1.5. The long regression results indicated the strongly significance as a father household head with AGEm, NVISTm, AGEhh, Ln_Live_Exp and Ln_HH_Incom. On the other hand, the short regression explored limited number of variables strongly significant such as AGEm, NVISTm, AGEhh and Ln_Live_Exp.

Table 1.5: Long-Short linear regression results of father as a household head in the 10 rural villages, 2013

Determinants	Dependent variable					
	Household yearly remittance received (RmY)					
	Long regression			Short regression		
	Coefficients	t-value	p-value	Coefficients	t-value	p-value
AGEm	-1.137	-5.650	.000	-.593	-3.459	.001
EDUm	.390	1.973	.051			
MARSm	-.414	-1.078	.284	-.942	-2.319	.022
YMIGm	.739	1.726	.087			
LEGSm	-1.029	-1.103	.273			
NVISTm	.663	4.796	.000	.639	4.767	.000
AGEhh	.411	3.465	.001	.435	3.364	.001
EDUhh	-.044	-.295	.769			
RELhh	.711	1.286	.201			
EMPShh	.295	2.448	.016	-.202	-2.631	.010
HHsize	.164	1.356	.178			
HLOWNtitle	.072	.214	.831			
Invest_Fin_Sec	.107	.592	.555			
Invest_Hous_Dev	.041	.050	.960	1.117	1.952	.053
Ln_Land	.174	.655	.514	.307	1.987	.049
Ln_Live_Exp	5.157	3.337	.001	2.293	3.054	.003
Ln_HH_Incom	-2.723	-5.121	.000			
Invest_Busi	.343	3.632	.000			
Ln_WelF	.022	.022	.982			
Loan_Rep	-.274	-.619	.538			
R^2			.696			.470
Adjusted R^2			.640			.434
F-statistic			12.392			13.279
Sum squared residual			189.429			331.067
Durbin-Watson statistics (d)			2.044			1.229
Observation			129			129

Source: Author calculation for this study

5.2.2 Wife as a household head

Due to statistical limitation, the long regression could not run into SPSS for wife household head while short regression result table 1.6 showed that the strong significance with other variable such AGEm, NVISTm, AGEhh, Invest_Hous_Dev, Ln_Land and Ln_Live_Exp.

Table 1.6: Short linear regression results of wife as a household head in the 10 rural villages, 2013

Determinants	Dependent variable		
	Household yearly remittance received (RmY)		
	Short regression		
	Coefficients	t-value	p-value
AGEm	-.805	-4.507	.000
NVISTm	.624	11.206	.000
AGEhh	1.011	4.655	.000
Invest_Hous_Dev	1.269	4.096	.000
Ln_Land	-.431	-2.897	.005
Ln_Live_Exp	3.945	9.034	.000
R2			.893
Adjusted R^2			.886
F-statistic			124.168
Sum squared residual			118.922
Durbin-Watson statistics (d)			1.618
Observation			96

Source: Author calculation for this study

5.2.3 Brother as a household head

As well as wife, the statistical problem was arisen in the long regression model for the analysis of the household relation to the migrant as a brother. However, short regression model at the following table 1.7 showed the significance with the AGEm, NVISTm and Invest_Hous_Dev.

Table 1.7: Short linear regression results of brother as a household head in the 10 rural villages, 2013

Determinants	Dependent variable		
	Household yearly remittance received (RmY)		
	Short regression		
	Coefficients	t-value	p-value
AGEm	-1.207	-12.384	.000
MARSm	.730	2.352	.028
NVISTm	.556	5.460	.000
AGEhh	.185	2.732	.012
Invest_Hous_Dev	2.548	12.966	.000
Ln_Land	.082	1.029	.315
Ln_Live_Exp	-.142	-.440	.665
R2			.979
Adjusted R^2			.972
F-statistic			145.485
Sum squared residual			2.798
Durbin-Watson statistics (d)			1.813
Observation			30

Source: Author calculation from the survey data

5.2.4 Mother as a household head

The household head relation to the migrant as a mother also did not run long regression model to determine the determinants of remittances. While the empirical results of the short regression indicated the strong relationship with the MARSm, NVISTm and Invest_Hous_Dev.

Table 1.8: Short linear regression results of mother as a household head in the 10 rural villages, 2013

Determinants	Dependent variable		
	Household yearly remittance received (RmY)		
	Short regression		
	Coefficients	t-value	p-value
AGEm	-.759	-2.533	.016
MARSm	2.874	3.204	.003
NVISTm	.406	3.500	.001
AGEhh	.204	.896	.376
MARShh	-1.527	-1.417	.165
Invest_Hous_Dev	2.527	4.280	.000
Ln_Land	.624	2.140	.039
Ln_Live_Exp	.687	.703	.487
$R2$			.786
Adjusted R^2			.738
F-statistic			16.500
Sum squared residual			62.315
Durbin-Watson statistics (d)			2.442
Observation			45

Source: Author calculation from the survey data

6. Conclusions

In this study, the rural household survey data from Bangladesh for the period of July to December, 2013, to analyse determinants of remittances and their socio-economic impact at the left behind household members. Rather than multilevel models, in this research use a three stages backward regressions elimination estimation process and build up econometric best fit model of remittances, which helps us the focus the analysis on the explanation of remittances determinants heterogeneity in micro-economic level of studies.

Unique result from the previous literature, which mostly focuses in general on the household head relation to the migrant. This study finds also analyse overall significance level of all other determinants of remittances. However, this research delves out more on the specific segment as the relationship to the migrant. This unit analysis allows us to test the significance level of different relation to the household head and their relationship with other key determinants of remittances at the household level at the rural micro economy.

The empirical findings suggest that the household head relation to the migrant is one of the strong determinants of remittances as well as other variables. In addition, the household head relation to migrant such a father, mother, brother and wife also have different influential factors

while the most common variable as number of visit by the migrant at the origin is strongly associates with all the relationship to the migrant although level of significance has slightly discrimination. The number of visit also indicate us the kinship relationship with household members and also unrecorded remittances both cash and kind.

Overall, the findings suggests that the age of migrant are strongly associates with father, wife and brother relation of the household head while the age of household head as father and wife. The investment in housing development strongly associates wife, brother and mother household head whereas household living expenses with father and wife. Individual determinants such as household income, land and marital status of the migrant are strongly associates with father, wife and mother household head respectively. Thus the study suggests more depth research required at the destination and the origin of the same household members.

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Appendix-I

Specification of variables for multivariate analysis

Group of variables	Name of variables	Identification
Dependent Variable		
Annual household remittance received	RmY	Natural log of yearly remittance, numeric (BDT)
Independent variable		
Individual characteristics (migrant and household head)	Age of migrant (**AGEm**)	Numeric (year)
	Education of Migrant (**EDUm**)	Numeric (coding)
	Marital Status of Migrant (**MARSm**)	Numeric (coding)
	Year of Migration (**YMIGm**)	Numeric (year)
	Legal Status of Migrant (**LEGSm**)	Numeric (coding)
	Number of Visit by Migrant (**NVISTm**)	Numeric
	Age of Household Head (**AGEhh**)	Numeric (year)
	Gender of Household Head (**GENhh**)	Numeric (coding)
	Marital Status of Household (**Head MARShh**)	Numeric (coding)
	Education Level of Household Head (**EDUhh**)	Numeric (coding)
	Religion of Household Head (**RELhh**)	Numeric (coding)
	Employment Status of Household Head (**EMPShh**)	Numeric (coding)
	Household Head Relation to Migrant (**RELMhh**)	Numeric (coding)
Household Characteristics	Household Size (**HHsize**)	
	Household Land Ownership (**HLOWtitle**)	Numeric (coding)
	Investment in Financial Sectors (**Invest_Fin_Sec**)	Numeric (coding)
	Investment in House Development (**Invest_Hous_Dev**)	Numeric (coding)
	Log of Household Living Expenditure (**Ln_Live_Exp**)	Natural log of HH yearly living expenditure, numeric (BDT)
	Log of Household Yearly Income (**Ln_HH_Incom**)	Natural log of yearly income except remittance, numeric (BDT)
	Investment in Business (**Inest_Busi**)	Numeric
	Log of Household Welfare Expenses (**Ln_Welf**)	Natural log of yearly HH welfare expenses, numeric (BDT)
	Loan Repayment (**Loan_Rep**)	Numeric (coding)

Source: Author developed for this study