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Research Article

Performance of Remittances in Household Investment Behaviour in the Sylhet Region of Bangladesh

Md. Zakir Hossain[1,*] & Jasim Uddin Ahmed[2]

Abstract

An optimal allocation of remittances in investment is essential for sustainable economic growth and inter-temporal and inter-generational consumption smoothing. This study intends to explore the share of remittances in household overall investment as well as performance of remittances in sector-wise investment in the Sylhet region of Bangladesh. The study has analyzed a primary dataset generated by a field survey covering 500 migrant and 250 non-migrant households from 30 clusters of the Sylhet region of Bangladesh. The study has used the Working-Leser model to find the relative share of household investment expenditure on different heads. The descriptive analysis indicates that remittances finance 68.16% of the total household expenditure and are utilized in almost fifty-fifty percent for investment expenditure and consumption expenditure. Sector-wise analysis on expenditure from remittances indicate that about 23% are invested in physical sector, about 15% in financial sector, about 11% in HRD sector, and only 2.41% in social services. The analysis of Working-Leser models indicate that the physical and financial investments increase by 0.14 and 0.05 units respectively, while the HRD investment and Social investment decreases by 0.15 and 0.04 units respectively for the 1% increase of the total investment expenditure of the household. The interaction variable of the estimated Working-Leser models also indicate that the migrant households have relatively less intensity to invest in physical and HRD sector, however, these households were found to have relatively high intensity to invest in financial and social sectors than those of their non-migrant counterparts.

Introduction[**]

Remittances are treated as a special kind of household income, which is more or less stable, countercyclical, non-debt creating, altruistic to a greater extent, particularly in Bangladesh, and as a whole unearned income for the recipients. These transfers generally influence the receiving households in a different fashion to utilize these transfers for serving their various purposes. It is documented that the remittances have a significant microeconomic impact at household level. The microeconomic impact of remittances at household level partially depends on the characteristics of the migrants and most importantly the characteristics of the recipients such as whether they constitute the rural poor or the rich sectors of the population residing in urban areas.

Historically, the Sylhet region in Bangladesh occupies the topmost position in sending the migrants abroad. In the early days, most of the migrants from the Sylhet region migrated to developed countries like the UK and the USA with immigration status and hence, they are considered as the permanent migrants. Their contribution is very much significant to our national economy through remittances and by other means too. The scenario of migration in the Sylhet region is changing over time in the context of destination of migrants. In the recent past, a very significant number of households got used to sending the migrants to the Middle-eastern countries and Malaysia due to the limited opportunities to send to the UK and the USA. An increasing trend to migration is observed towards Middle-eastern countries and it is expected that this trend will continue for a long time. The

[1]Professor, Department of Statistics, Shahjalal University of Science & Technology, Sylhet, Bangladesh
[2]Professor of Economics, Chandpur Government College, Chandpur, Bangladesh
[*]Corresponding author: Dr. Md. Zakir Hossain, Email: mzhossain.bds@gmail.com
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remittances sent by the migrants of the Sylhet region through formal sector was found Tk.12656.23 crore, about 11% of the total remittances of the country (Bangladesh Bank, 2015). It can be assumed that they are sending only a little portion of their funds, which are necessary for relatives and/or family members they left behind.

In Bangladesh, most of the studies on migrants' foreign remittances flow to Bangladesh have focused on the uses of these transfers. The studies dealt with the spending pattern of remittances at household level found that the beneficiaries spend the remittances mostly in housing and/or land purchasing (Bruyan and Kuddus, 2005; Murshed *et al*., 2000; Siddiqui and Abrar, 2003; Siddiqui, 2001; Uddin, 2011). According to the view-point of the recipients, lack of viable avenues for investment, lack of sound law and order situation and concomitant pressure from the extortionists, they consider land as the safest avenue for remittance utilization. Besides, these studies argue that arable land immediately provides economic return in terms of crop production and value of both arable and homestead land increases over time. Furthermore, these studies argue that use of remittances in releasing mortgaged-out land is also quite important in the rural context as it re-establishes the right of the person to land cultivation.

These studies conclude that remittances play a significant role in the socioeconomic development process of the families of migrants in Bangladesh (Hossain, 2015; Uddin, 2011). The most important limitation of these survey-based studies is that the sample size is too small to draw strong conclusions on the pattern of the utilization of remittances at household level. Salam (2003) makes an attempt to have explored the socio-economic impact of foreign remittances in Bangladesh economy with the help of descriptive statistical tools and techniques only. In a research report, Bakht and Mahmood (1989) have elaborately discussed the different channels of transferring remittances to Bangladesh. They also make an attempt to analyze the uses of remittances using only the descriptive statistical tools but not inferential tools and techniques. Murshed *et al.* (2000) have explained the importance of remittance inflows for Bangladesh economy, amount of this inflow to Bangladesh per year, and its economic effects. Azad (2005) documented that migrant workers' remittances were a strong source of foreign exchange earnings for Bangladesh, but Bangladeshi migrants are mostly semi or unskilled workers whose earnings are low.

The Bangladeshi migrants tend to be risk averse and therefore less interested to invest in rural sectors including micro enterprises. In a study, Rahman (1981) highlights on the mathematical relationship between remittances and employment. This study is entirely based on secondary data and does not consider many things for analysis such as income, saving, expenditure, social impact and so on. Moniruzzaman (2009) makes an attempt to assess the macroeconomics implications of foreign remittances in Bangladesh economy. A study conducted over Sylhet region entitled "Lack of Utilization of Local Funds and Investment Climate in Sylhet Region: Perception Analysis" shows that a substantial portion of remittances are utilized in less productive sectors like purchasing of land, construction of luxury, splendid and high-rise buildings, conspicuous consumption *etc.*, which are very commonly and evidently found not only in urban areas but also in remote rural areas all around (Hossain *et al*., 2010). So, it can be assumed that a minimal portion of remittances is going into productive investment.

It is evident that the international migration and remittances industries sometimes suffer from asymmetric information and moral hazard problem, which indirectly put an impact on the allocation pattern of foreign remittances, particularly investing in productive sectors. There is no denying that remittances substantially contribute to the generation of local funds in the Sylhet region of Bangladesh (Hossain *et al*., 2010). It is very much necessary to get a clear message about the allocation and utilization pattern of foreign remittances at micro level for appropriate policy implications not only at household level but also at national level since macroeconomics stands on micro foundation. The study intends to explore the investment pattern at micro-household level in terms of analysing (i) the shares of investment expenditure in household over-all investment by migration status; and (ii) shares of investment expenditure of remittances in over-all household remittances investment expenditure on different investment sectors in the Sylhet region of Bangladesh.

Data and Methods

The data for this study has been extracted from the data collected under the research project "Capital Formation through Remittances and Investment Climate: A Study in the Sylhet Region" sponsored by the Social Science Research Council (SSRC), Planning Commission, Government of Bangladesh (Hossain, 2015). This study has adopted cluster sampling with systematic probability proportionate to size (PPS) procedure in which Primary Sampling Units (PSU) of Bangladesh Bureau of Statistics (BBS) have been counted as clusters. A PSU (cluster for the study) contains about 250 households, usually known as a *mauza* in the rural area and a *mahalla* in the urban area. According to the newly prepared list of PSUs of BBS, there are 161 PSUs in the Sylhet Division without any urban-rural divide. The study collected data from 30 clusters, which is regarded as the minimum number of clusters needed to have a statistically representative sample of a population by internationally recognized survey designs (Turner *et al*., 1996). The thirty clusters were selected following systematic probability proportional to its size procedure. Appropriate weight with a scale of 1 to 100 has been given to select the sampling units by considering the concentration of remittance-receiving households of the clusters (PSUs). The weight of different clusters has been fixed on the basis of perception and anecdotal evidences. According to the recognized sample size determination formula for cluster sampling method[2], the required number of sample households stands 507 with 50% indicator percentage, 95% confidence interval and assumed design effect 1.32.

Several authors argued that it is difficult to study the impact and determinant of migration without the information of the non-migrant household (Afsar, 2000; Billsborrow et al., 1987; Hossain *et al*., 2016; Oberai and Singh, 1983). Keeping this view in mind, the study conducted detailed interview of 210 non-migrant households for studying the socio-economic variation and allocation pattern of investment at household level in addition to the 510 international migrant-sending households. Finally, 17 international migrant households from each cluster were selected using the UNICEF pencil-spin method. In addition, 7 non-migrant households from each cluster were selected using simple random sampling procedure. A structured interview schedule was employed for collecting the necessary data and information on allocation pattern of remittances on different heads. The data were collected during June-September, 2014.

Analytical Techniques

This study has resorted to a special type of multiple classical regression model named Working-Leser Model in addition to the descriptive statistics. The Working-Leser Model is used to find the relative share of different heads of household expenditure and investment. This model was originally developed by Working in 1943 and later on Leser proved its better fit. The beauty of this model is that it relates the share of some variable linearly to the logarithm of that variable on the assumption that the summation of all the shares becomes one. The sign of the coefficient of the variable, logarithm of the concerned variable, determines the changing behaviour of the response share variable with the change of the concerned variable. If the sign of the coefficient is positive, it means that with the increase in the concerned variable, the value of the response variable increases as well and vice versa. In this model, shares are considered as independent variables. This study has adopted the modified three-stage version of the Working-Leser Model for accommodating related independent variables (demographic, regional, and interactive). The original three-stage version of Working-Leser Model is:

$$\frac{c_{ij}}{y_i} = \beta_i + \gamma_i (\log y_i)$$

Where C_{ij}/y_i is the fraction of the concerned variable for j^{th} unit of analysis on item i and y_i is the concerned variable. Adding up requires that $\Sigma(C_{ij}/y_i)$ equals 1. This modified version of the Working-Leser Model in semi-log ratio form along with the interactive, demographic and regional variables is as follows (Adams, Jr., 2006):

[2] n = p(1-p)(z^2/e^2)**Deff* ; where p=proportion of an indicator = 0.50, Z=1.96 (normal variate value at 5% level of significance), e= 0.05 (amount of admissible error), and *Deff*=1.32 (assumed design effect).

$$\frac{c_{ij}}{y_i} = \beta_i + \gamma_i(\log y_i) + \sum \lambda_i(z_i)$$

where z_i denote household and community characteristic variable. This modified Working-Leser model allows the demographic and regional variables as covariates and has the advantage that the coefficients can be explained in the elasticity form.

Results and Discussion

As the study intends to explore the performance of remittances on sector-wise household-level investment in the Sylhet region of Bangladesh, it is necessary to explore the income and expenditure behaviour of the study households in addition to the allocation of remittances in investment sectors. Therefore, the findings of the study are categorically discussed in terms of income and expenditure behaviour of the households; share of remittances in household overall investment; relative performance of remittances in investments in different sectors in the following sub-sections.

Income and Expenditure Behaviour of the Households

In Bangladesh, the rural economy is mainly agro-based and near three-fifths of the population directly depend on agriculture in terms of employment and they contribute about 17% to GDP (BBS, 2008). The economic activities, particularly, production in agricultural sector is directly related to the rural income. Hossain and Bayes (2009) have argued that the estimation of rural household income in Bangladesh is very complex and problematic since there is hardly any record keeping system for purchased inputs and outputs in the wake of the vast spectrum of informal transactions in rural areas. The problem of income estimation incurs when households' own production and in-kind receipts are not treated as income. Hence, the estimates of rural household income remain to be noisy and especially, the balance is tilted towards under-estimation. However, almost the reverse happens regarding expenditure. The income from different sources as well expenditure on different heads have been analyzed by migration status and described below.

Income from Different Sources

The study covers a wide range of income sources, *viz.*, crops and vegetables, fish farming, poultry and livestock, fruits & timbers/forestry, off-farm activities (job, trade, rent, internal remittances, business etc.) and income through foreign remittances (Table 1). The average household income from a particular crop has been estimated for the households who had cultivated the crop with the formula: *Average Income = Σ(Production × Market Price)/ Number of cultivating HHs.* Similarly, the income from other sources also estimated using only those households who had such kinds of income source. In overall agricultural sector, the average annual income was found high from crops for both the migrant and non-migrant households indicating the dominating characteristic of crop production in rural agro-economy. The findings reveal that the overall average annual income per household was significantly ($p<0.001$) higher for migrant households than that for their non-migrant counterparts.

It is to be noted that income from off-farm activities occupies a cosiderably vital place in the total household income for both the groups, though farm sector activities dominate, indicating a change in the structure of overall rural economic activities towards off-farm activities (Table 1). It is found out that non-migrant households had significantly ($p<0.01$) higher income (Tk.318,786.76)[3] from off-farm activities other than cash remittances than their migrant counterparts (Tk.242,773.36). The analysis on the differentials of income from different sources between migrant and non-migrant households explores that the amounts of income earned from crops and vegetables, fish cultivation, forestry, non-farm activities and in-kind remittance are statistically significantly higher for non-migrant households than those for migrant households (Table 1). The average annual income from poultry, livestock & by-product was found slightly higher for migrant households than for their non-migrant counterparts and there is no significant differences.

[3] Tk.80.00 = 1 US $

Aggregately, the annual average income is estimated at Tk.586,117.96 and Tk.371,329.73 for the migrant and non-migrant (controls) households respectively; while the corresponding per capita figures are estimated at about Tk.85,339 and Tk.66,574 respectively. It is to be noted that the average annual household income was reported as Tk.137,748 by Household Income and Expenditure Survey 2010 (HIES, 2010). The average income estimated by this survey is considerably higher than some other estimates by national surveys of Bangladesh partially due to selectivity of the sample households and partially for the rising trend of rural income in course of time. These findings reveal that on an average, the migrant households are richer than the non-migrant households in rural Bangladesh; might be due to the income from remittances.

Table 1: Income pattern of the households by migration status

Sources	Migrant Households		Non-migrant Households		Total Households	
	No. of HHs	Average income (in Taka)*	No. of HHs	Average income (in Taka) *	No. of HHs	Average income (in Taka) *
Crops and vegetables	205	67911.17 ±39799.89	88	80490.03 ±102998.31	293	71689.12 ±129800.60
Fish cultivation	24	64083.33 ±05594.35	09	93222.22 ±160228.57	33	72030.30 ±120855.93
Poultry, livestock & by-product	82	19430.67 ±44998.11	40	17387.55 ±15657.17	122	18760.80 ±37886.76
Forestry	81	16762.47 ±29811.67	34	21405.88 ±34223.03	115	18135.30 ±31100.47
Non-farm income other than remittance	377	242773.36 ±358084.35	204	318786.76 ±353690.98	581	269463.09 ±358088.74
Remittance (in-cash)	507	361771.20 ±258925.29	-	-	507	361771.20 ±258925.29
Remittance (in-kind)	99	44378.79 ±59923.34	30	70533.33 ±71177.65	129	50461.24 ±63404.07
Total	**508**	**586117.96 ±431068.42**	**206**	**371329.73 ±354266.40**	**714**	**524148.25 ±421546.04**

* 1 US $ =Taka 80.00

Share of Incomes from Different Sources to the Total Household Income

Figure 1 demonstrates the share of incomes generated from different sources for both migrant and non-migrant households. Very logically, the non-migrant households had no income from cash remittances. The findings indicate that about 85% household incomes have been generated from non-farm activities for non-migrant households. The study explored that over 60% of the household income have been generated from remittances for migrant households in the Sylhet region of Bangladesh, which is slightly lower than the national survey figure (74.71%) (BBS, 2014). The next highest percentage (30.74%) of household income has come from non-farm activities for migrant households. The findings indicate that the share of income from agricultural sectors is not notable for both migrant (6.2%) and non-migrant households (12.2%).

Expenditure and Investment Behaviour of the Households

The analysis of consumption and expenditure pattern is essential to determine the investment behaviour of the households. This study considers six heads of expenditures *viz.*, (i) expenditure on consumption of major food and non-food items, (ii) expenditure on durables, (iii) expenditure on physical investment, (iv) expenditure on financial investment, (v) expenditure on human resources development investment and (vi) expenditure on social investment of the study households. Table 2 demonstrates the annual expenditure pattern of the households by migration status. The annual expenditure on current consumption (food, housing and daily necessities) is estimated at

Tk.254,488.95 and Tk.207,792.52 for migrant and non-migrant households respectively. It is found that about three-fifths of the households, both migrant and non-migrant, have expenditure on durable goods with an average amount of Tk.29,365.51 and Tk.14,081.75 respectively.

Figure 1: Share of income from different sources to total household income

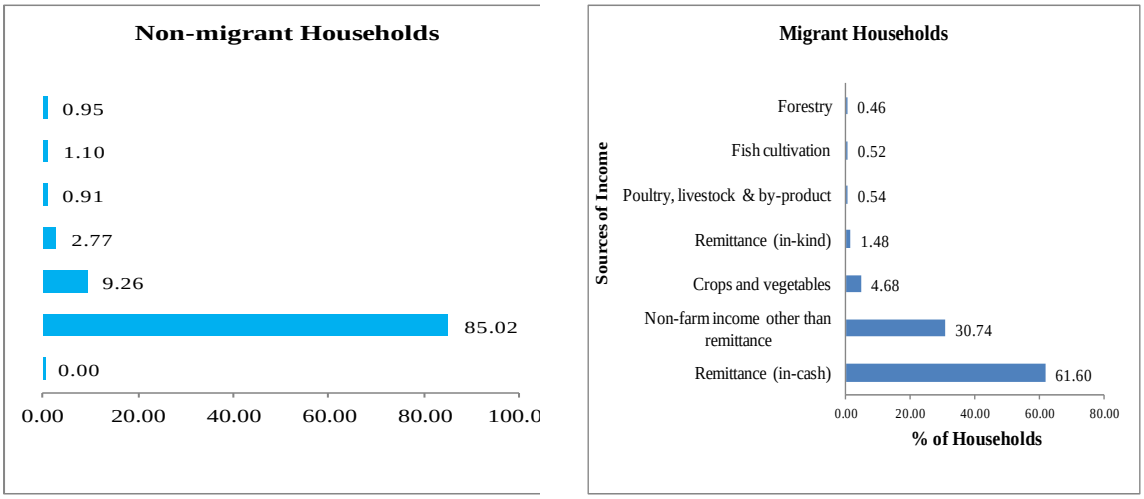

Table 2: Expenditure/Investment pattern of the households according to the migration status

Expenditure heads	Migrant Households		Non-Migrant Households	
	% of Consumer HHs	Average Expenditure (in Taka)	% of Consumer HHs	Average Expenditure (in Taka)
Food and Daily necessities	100.0	254488.95 ±200018.65	100.0	207792.52 ±347484.20
Durable goods	59.65	29365.51 ±38887.04	61.17	14081.75 ±19894.70
Physical Investment	63.98	211523.85 ±389577.54	57.77	128998.32 ±237154.08
Financial Investment	55.31	168431.38 ±366307.91	42.72	85661.81 ±241896.97
HRD	98.82	55432.31 ±52572.58	99.51	43656.34 ±54394.64
Social investment	95.28	13304.23 ±22786.88	88.35	4699.84 ±7456.83
Total Number of Households (n)	**508**	**567950.53 ±545476.92**	**206**	**375114.17 ±473219.95**

The findings indicate that about 64% migrant and about 58% non-migrant households have physical investment in terms of purchasing land, house construction/purchase/repair, purchasing agricultural equipment and investment for migration. The average amount of investment in this sector is estimated at Tk.211,523.85 for migrant households and Tk.128,998.32 for non-migrant households. Over half of the migrant households were found to have financial investment in terms of share, bond, DPS, FDR etc., while about 43% non-migrant households were found to have investment in this sector. The average amount of investment in this sector is estimated at Tk.168,431.38 for migrant households, which is nearly double than that of the non-migrant households. Very logically, nearly all the households, both migrant and non-migrant, have some sort of investment on human resources development in terms of education, healthcare, skill development etc., and the average investment amount is estimated at Tk.55,432.31 for migrant households and Tk.43,656.34 for non-migrant households. The average amount of social investment is estimated at Tk.13,304.23 for migrant households and Tk.4,699.84 for non-migrant households.

This study has explored that the average annual expenditure on current consumption (for food and daily necessities) tops the list followed by the expenditure on physical investment for both migrant and non-migrant households. The analysis of the differentials of expenditure on different heads by migration status indicates that the average expenditure is significantly higher for migrant households than their non-migrant counterpart for food and daily necessities, durable goods, physical investment, financial investment, HRD investment and social investment.

Contribution of Remittances in Household Expenditure/Investment

Table 3 shows the contribution of remittances in terms of percentage in total expenditure in different heads as well as average amount of remittances (in Taka) invested in different heads for both the migrant and the non-migrant households. The contribution of remittances in total expenditure of the migrant households is found 68.16%, while it is estimated at 1.93% only for non-migrant households.

Table 3: Contribution of remittances to the total expenditure of the households according to the migration status

Expenditure heads	Migrant Households		Non-Migrant Households	
	Contribution of Remittance (% of remittance in total expenditure)	Average amount of Remittance (in Taka)	Contribution of Remittance (% of remittance in total expenditure)	Average amount of Remittance (in Taka)
Food and Daily necessities	69.40	176615.77 ±120653.83	1.52	3155.34 ±11665.88
Durable goods	75.66	22217.99 ±30982.92	4.42	622.22 ±4614.91
Physical Investment	65.43	138398.46 ±269548.50	0.91	1176.47 ±6401.33
Financial Investment	62.98	106073.67 ±168038.62	2.07	1772.73 ±11870.69
HRD	74.32	41194.96 ±47044.53	5.18	2263.41 ±10162.35
Social investment	73.70	9805.42 ±20761.17	0.00	-
Total	**68.16**	**387135.34 ±337112.93**	**1.93**	**7225.24 ±24379.21**

The average amount of remittances contribution is estimated at Tk.387,135.34 and Tk.7,225.24 respectively for migrant and non-migrant households. The analysis indicates that about 45% of the total expenditure spent on food items for migrant households, which is very close to the figure reported by the BBS though "Survey on the Use of Remittance -2013" (BBS, 2014). Among the total expenditure on current consumption, nearly 70% came from remittances for migrant households, while it was only 1.52% for non-migrant households. The contribution of remittances is estimated at 65.43%, 62.98%, 74.32% and 73.70% in physical investment, financial investment, HRD investment and social investment respectively for migrant households.

Share of Remittances in Household Overall Investment

The proportion of remittances in different investment sectors of the migrant households is analyzed and the results are shown in Table 4. The analysis is performed by considering the relative contribution of remittances for both total expenditure from all sources and total expenditure from remittances in different investment sectors. The analysis revealed that 51% of the remittances were allocated for investment expenditure and the rest of the amount were utilized for consumption expenditure while considering total expenditure from remittances. Out of the total investment expenditure from remittances, about 23% was invested in physical sector, about 15% in financial

sector, about 11% in HRD sector, and very logically only 2.41% in social services (Table 4). The findings indicate that about half of remittances was used for the consumption expenditure.

Table 4: Percentage of remittance in different investment sectors for migrants households

Heads of expenditure	% of remittances in different heads of gross total expenditure		% of remittances in different heads of total expenditure from remittances	
Physical Investment	15.59	34.73	22.87	50.96
Financial Investment	10.33		15.16	
HRD Investment	7.17		10.52	
Social Investment	1.64		2.41	
Consumption	-	33.43	-	49.04
Total	**-**	**68.16**	**-**	**100.00**

The analysis revealed that the contribution of remittances to consumption expenditure and investment expenditure are 33.43% and 34.73% respectively while considering total expenditure from all sources. This means that 68.16% of the total household expenditure has been found to come from remittances (Table 4). The findings indicate that the other sources of household income contribute about 32% expenditures for migrant households of the Sylhet region of Bangladesh.

Relative Performance of Remittances on Investments in Different Sectors

The relative performance of remittances on investments in different sectors has been assessed through the application of the Working-Leser Model described earlier in the Analytical Techniques. Here, the performance of investment in a particular sector is assessed based on the changing pattern of the share of total investment spending in this sector with the change of total investment expenditure. The rationale of this procedure lies in the revealed preference theory, i.e., as the share increases with the increase in total spending, it implies that this sector is revealed to have performed better in terms of productivity and profitability. The Working-Leser model is an ideal choice in this situation, because this econometric model satisfies the following fundamental assumptions: (i) The selected model provides a good statistical fit to a wide range of variables; (ii) The selected form mathematically allows for rising, falling or constant marginal propensities to spend over a broad range of variables; and (iii) The chosen form conforms to the criterion of additivity (i.e., the sum of the marginal propensities for all variables should equal unity). In order to assess the relative performance of remittance for different shares of household expenditure, two distinct types Working-Leser models have been performed considering two situations: (i) total investment expenditure, and (ii) total investment expenditure from remittances only. The model specification with the findings are discussed below:

(i) Share of total investment expenditure on different investment sectors

The Working-Leser model has been customized to evaluate the relative performance of investment in a particular sector with the various individual and household characteristics (variables). Considering the required variables, the model is specified as follows:

$$\frac{C_{ij}}{Y_i} = \beta_i + \alpha * (\log Y_i) + \lambda_1 * HH\ Size + \lambda_2 * Land + \lambda_3 * Education + \lambda_4 * Asset + \lambda_5 * Age + \lambda_6 * (\log Y_i) * Type\ of\ HH\ + \lambda_7 *\ DR + \lambda_8 * EDR + \lambda_9 * Female\ percentage + \varepsilon_i$$

where, C_{ij} = Total investment amount of the i-th household in the j-th investment sector; Y_i = Total investment amount of the i-th household; HH Size = Household size; Land = Total operative land of the households; Education = Educational qualification of the household head; Asset = Wealth score of the households; Age = Age of the household head; Type of HH = Type of household (Migrant= 1); DR = Dependency ratio; EDR = Economic dependency ratio; Female percentage = Percentage of female in the surveyed households.

Table 5 shows the estimated regression coefficients of the four Working-Leser models employed to evaluate the relative performance of physical investment, financial investment, HRD

investment, and social investment on total household investment expenditure. The values of the F-statistic along with the p-values indicate that all the four models satisfy the goodness of fit test. The value of R^2 was found reasonably high for the models of physical and HRD investment. The positive coefficients of the logarithm of total household investment expenditure indicate that the share of total household investment expenditure for the physical investment and financial investment significantly increase with the increase in total household investment expenditure of the surveyed households. On the other hand, negative logarithm coefficient of household investment expenditure implies a reverse scenario for HRD investment and social investment. The coefficient of interaction between logarithm of total household investment expenditure and type of the household (migrant household=1) indicates that with the increase in total household investment expenditure, the share of investment in physical sector and HRD sector significantly decreases for the migrant households. On the other hand, the coefficient of the interaction variables for the other two models indicate that the share of financial investment and social investment were found to increase significantly for migrant households with the increase of total investment.

Table 5: Estimated regression models (Working-Leser model) for different share of total investment expenditure

Explanatory Variables and Interactions	Estimated Coefficients for the Models against Different Shares of Household investment Expenditures			
	Physical Investment	Financial Investment	HRD Investment	Social Investment
Logarithm of total household investment expenditure	0.142***	0.048***	-0.152***	-0.037***
Household size	-0.004	-0.006	0.007**	0.003*
Total amount of land	0.00000048	.000000543	-0.0000326	0.000026
Education of household head	-0.008***	-0.002	0.007***	0.003***
Asset Score	-0.003***	0.001*	0.001***	0.001***
Age of household head	-0.002**	0.000	0.001	0.000
Logarithm of total household investment expenditure * Type of the HH (Remittance receiving HH= 1)	-0.004*	0.005**	-0.005**	0.003***
Dependency ratio	0.045*	0.013	-0.050**	-0.007
Economic dependency ratio	-0.022***	-0.017**	0.040***	-0.001
Percentage of female	0.000	0.001	-0.001*	-0.0000615
Constant	-0.913***	-0.422***	1.964***	0.372***
R^2 and Adjusted R^2	0.248 and 0.237	0.096 and 0.083	0.385 and 0.376	0.173 and 0.162
F-test with P-value	23.164 (p<0.01)	7.495 (p<0.01)	43.974 (p<0.01)	14.738 (p<0.01)

Apart from the impact of two main coefficients discussed above, the fitted model for physical investment indicates that education of household head, asset score, age of the household head, dependency ratio, economic dependency ratio have had significant impact on physical investment. The asset score and economic dependency ratio were found to have significant impact on financial investment. The findings of the model for HRD investment indicates that household size, education of household head, asset score, age of the household head, dependency ratio, economic dependency ratio and percentage of female headed households have had significant impact on HRD investment. In case of the model for social investment, it is found that household size, education of household head and asset score put significant impact on HRD investment at household level. It is important to mention that total amount of operative land had no significant impact on any of the four models (physical investment, financial investment, HRD investment, and social investment).

The upshot of the findings of the estimated Working-Leser models is that the physical and financial investments increase by 0.14 and 0.05 units respectively for the 1% increase of the total investment expenditure of the household. The findings leads to conclude that possibility of physical investment is about 3 times higher than financial investment for the 1% increase of the total investment expenditure of the household. On the contrary, the HRD investment and Social investment decreases by 0.15 and 0.04 units respectively for the 1% increase of the total investment expenditure of the household. The findings also indicate that the international migrant sending households have relatively less intensity to invest in physical and HRD sector than that of their non-migrant counterparts. However, the international migrant sending households were found to have relatively high intensity to invest in financial and social sectors in comparison to the non-migrant households.

(ii) Share of Total Investment Expenditure from Remittances on Different Investment Sectors

Since this sub-section intends to segregate the total household investment expenditure from remittances only, therefore the analysis is performed by considering the international remittance-receiving households only. Hence, the models did not consider any interaction variables. Considering the required variables, the model can be defined as follows:

$$\frac{C_{ij}}{Y_i} = \beta_i + \alpha * (\log Y_i) + \lambda_1 * Land + \lambda_2 * HH\ size + \lambda_3 * Education + \lambda_4 * Migrant + \lambda_5 * Age + \lambda_6 * Asset\ + \lambda_7 *\ DR + \lambda_8 * EDR + \lambda_9 * Female\ percentage + \varepsilon_i$$

where, C_{ij} = Total investment amount from remittances in the j-th investment sector; Y_i = Total investment amount of the household from remittances; Land= Total operative land of the households; HH Size= Household size; Education= Educational qualification of the household head; Migrant= Number of migrant; Age= Age of the household head; Asset= Wealth score of the households; DR= Dependency ratio; EDR= Economic dependency ratio; Female percentage= Percentage of female in the surveyed households.

Table 6: Estimated regression models (Working-Leser model) for different share of total investment expenditure from remittance

Explanatory Variables and Interactions	Estimated Coefficients for the Models against Different Shares of Household investment Expenditures			
	Physical Investment	Financial Investment	HRD Investment	Social Investment
Logarithm of total household investment expenditure from remittance	0.124549***	0.076878***	-0.14694***	-0.05448***
Total amount of land	0.000012	-0.000004	-0.000035	0.000027
Household size	0.002113	-0.002892	0.000023	0.000756
Education of household head	-0.001950	-0.011183***	0.010291***	0.002842*
No of Migrant	-0.030535*	-0.052265***	0.026899*	0.055901***
Age of the household head	-0.001175	0.000051	0.001311	-0.000187
Asset score	-0.00253***	0.001370**	0.000691	0.000471*
Dependency ratio	0.031534	0.020421	-0.036252	-0.015703
Economic dependency ratio	-0.0356***	-0.007294	0.040153***	0.002742
Percentage of female	0.000692	0.000363	-0.001192	0.000137
Constant	-0.81239***	-0.604384***	1.840496***	0.576277***
R^2 and Adjusted R^2	0.205 and 0.189	0.123 and 0.105	0.293 and 0.279	0.250 and 0.235
F-test with P-value	15.607 (p<0.01)	6.856 (p<0.01)	20.258 (p<0.01)	16.257(p<0.01)

Table 6 shows the estimated regression coefficients of the four Working-Leser models employed to evaluate the relative performance of physical investment, financial investment, HRD investment, and social investment on total household investment expenditure from remittances only. The values of the F-statistic along with the p-values indicate that all the four models satisfy the goodness of fit test. The positive coefficients of the logarithm of total household investment expenditure from remittances indicate that the share of total household investment expenditure for the physical investment and financial investment significantly increase with the increase in total household investment expenditure from remittances of the surveyed households. On the other hand, negative logarithm coefficient of household investment expenditure from remittances implies a reverse scenario for HRD investment and social investment. Apart from the impact of the main variable, the fitted model for physical investment indicates that number of migrants, asset score, and economic dependency ratio have had significant impact on physical investment from remittances. It is found out that education of the household head, number of migrants, and asset score have significant impact on financial investment. The findings from the models for HRD investment indicate that education of household head, number of migrants, and economic dependency ratio have significant impact on HRD investment. In case of the model for social investment, it is found out that education of household head, number of migrant, and asset score put significant impact on social investment at household level.

The findings indicate that number of migrants have significant impact on all the four models. It is to be mentioned here that total amount of operative land, household size, age of the household head, dependency ratio of the household, and percentage of female-headed households were found to have no significant impact on any of the four models, *viz.*, physical investment, financial investment, HRD investment, and social investment. The outcome of the findings of the four estimated Working-Leser models described above indicates that the performance of physical investment and financial investment is positive and significant. That is, if the total expenditure from remittances increases, the investment in these two sectors increases significantly. The findings lead to conclude that if remittances inflow at household level increases the investment expenditure from remittances, a significant share of the remittances is invested in physical and financial sectors.

Conclusions

The remittances substantially contribute to the income of the migrant households. The study discovers that over two-thirds of the household expenditure comes from remittances for migrant households. The analysis reveals that the contribution of remittances to consumption expenditure and investment expenditure are almost same that is fifty-fifty. The study indicates that the highest amount of remittances is invested in physical sector, followed by financial sector and by HRD sector.

The first model-based analysis explores that the share of total household investment expenditure from remittances for the physical and financial investment significantly increases with the increase in total household investment expenditure. In addition, the interaction variable findings indicate a different pattern of investment by migration status of the households in that with the increase of total household investment expenditure, the share of physical and HRD investments significantly decreases, while the share of financial and social investments significantly increases for migrant households. The second model-based analysis explores that the migrant sending households significantly increase the shares of remittances spending on financial and social sectors as total remittances investment expenditure increases. Over-all findings indicate that remittances significantly stimulate the financial sector in the economy as a whole for creating an opportunity for socioeconomic development.

Recommendations

1) The government should play the pioneering role in actualizing the optimal utilization of remittances in different potential investment sectors in terms of performance explored by this study by providing various regional policies regarding tax, credit, land and other infrastructures.

2) Investment capacity building programs as well as investment motivation programs should be undertaken by both private and public sectors in short-run and long-run.

Limitations

The main limitation of this study is that the collected data on yield, income from different sources, consumption and expenditure on different heads are perception based. The amount reported by the respondents are used. Though the cross-verification has been done, however still there might be some problems regarding actual amount. Though the prices of different crops are collected at different places at different time points, the market prices are based on the farmer's perception. In addition, the study is regional instead of being national.

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