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Investment Expenditure Behavior of Remittance Receiving Households: An Analysis Using Reserve Bank of India Data

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Abstract

Although it is the world's largest recipient of remittances, India lacks information about the investment behavior of its remittance receiving households. Using data from Reserve Bank of India and the Tobit analysis, this paper examines how remittances, different household and migrant characteristics have affected both the propensity to invest and the amount of investment by the remittance receiving households. The findings have significant implications for policy purposes. For example, government programs can create incentives for older migrants to have more remittance transfers. Remittance money used for children's education could be matched to create robust flow of educational investments.

Keywords: Remittances, household investment expenditure; India.

Introduction

It has long been recognized that remittances affect the economic development of remittance receiving countries (for an overview see Taylor and Martin, 2001, Bhagwati, 2003; Birdsall et al., 2005) by working as substitutes for well-functioning credit and capital market. They can promote investment, generate financial or physical or human capital and thus, can affect both the total household expenditure and the budget share of each item (used by the household) in that expenditure.

There is evidence that remittances have increased student retention rate in El Salvador (Edwards and Ureta, 2003), investment in entrepreneurship in Mexico (Woodruff and Zenteno, 2007), expenditure on agricultural investment in China (Taylor, Rozelle and Brauw, 2003), expenditure on housing in Nigeria (Osili, 2004), schooling and entrepreneurial activities in Philippines (Yang, 2006 & 2008), landholding in Pakistan, expenditure on housing and education in Guatemala and expenditure on health, housing and education expenditure in Ghana (Adams 1998, 2010, and 2013). Zachariah & Rajan, (2007a, 2007b) find that remittance-based investment has taken over from remittance based consumption, as the new driver for economic growth in India, Bangladesh and Pakistan (see Combes and Ebeke, 2011; Quisumbing and Mcnien, 2010;

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Mesnard, 2004; Chami et al., 2003; McCormick et al., 2001, Rosenzweig and Stark, 1989).

However, it is surprising that there is no analysis about the expenditure pattern of the remittance receiving households in the top remittance receiving countries of the world like India ($70b in 2013) and China ($60b). This gap in the literature begs lots of question when the government of the labor sending countries like India engages in boosting the flow and use of the remittances to facilitate the goal of an ambitious rate of growth for the economy.[1] The objective of this study is to take advantage of a data set collected by Reserve Bank of India (RBI) on "Private Remittances to India" to fill up this gap in the literature. More specifically, we examine the factors that may have affected the investment expenditure of remittance receiving households.[2] The survey we use covers areas with high (more than 90%) concentration of inward remittances and thus presents a representative snapshot of remittance transaction in India.

Both the importance of the topic and the timing of the analysis can't be overemphasized because after years of corruption, failed policy reforms, bureaucratic red tapes, growth inhibiting infrastructure, government regulation for setting up new industries, India's present government is trying to increase the pace of investment anyway possible (WSJ, May 26, 2015). Efforts are underway to encourage higher inflow of remittances to the country and to boost the investment expenditure of remittance receiving households.

Our data set collects information from those migrant households in India, whose migrant member has opened up a Non-Resident Rupee Account (NRRA).[3] It should be noted that the purpose of NRRA is to encourage capital inflow in India. Since not all remittance receiving households may have engaged in investment expenditure, investment expenditure would generate 'zeros' for some households and continuous positive values for others. From the alternatives available in dealing with this mixture of continuous and discrete distributions, we have selected the Tobit analysis for estimation.

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[1] Wall Street Journal (September 25, 2015) reports " Trooping across the globe, from Japan to China and the U.S., the Indian prime minister has connected with the India-origin community, motivating its members to reconnect with their motherland and contribute with investments, technology and 21st century solutions to India's stickiest problems".

[2] Remittances in this data set are the total values in Rupees of everything sent by the migrants to their families back at home.

[3] The RBI has used NRRA to contact the migrant household, since migrant member has an option to use the household address as migrant's address in India. Historically, these accounts have increased capital inflow in India. The accounts are opened by migrants themselves and fees are waived for encouraging deposits. Migrant owners of the accounts have full control of the accounts. The account holders don't necessarily remit and remitting migrants with NRRA have also sent remittances through some other means. It is important to remember that not all migrant households of our sample have received remittances through NRRA. see http://www.smartpaisa.in/2013/02/non-resident-indian-nri-different-type-bank-accounts-nro-nre-fcnr.html

We find that in our sample, households have engaged in investment expenditure when remittances are mostly from male migrants and when the migrants are, on average, older. Larger households have higher budget share of investment expenditure. Household asset holding has statistically significant effect on investment expenditure. Ownership of bank account affects investment expenditure negatively and migration duration doesn't have any effect on the investment expenditure in our sample. The findings for ownership of bank account and migration duration contrast the findings of the existing literature. For this sample, migrant's income has a negative effect (hinting at insurance motive for sending remittances) on investment expenditure. Entrepreneurial jobs are the most preferred jobs for the migrants of this sample. However, households with self-employed migrants and households whose migrants have worked as Seamen have invested more in our sample compared to the households whose migrants are entrepreneurs.

The rest of the paper is organized as follows. After presenting the conceptual background and the estimation strategy in section 2, we provide the description of data in section 3. Section 4 and 5 report the results and their robustness. We conclude in section 6.[4]

Conceptual Background and Estimation Strategy

We allow each household to maximize its utility from two goods subject to the budget constraint that includes remittances along with other types of income.[5] From this utility maximization, we derive for each good a demand function which depends on remittances along with other things.[6] We then re-write the

[4] As regards the history of remittances in India, in 2010, India was the largest recipient (66%) of remittances to the South Asian region which brought in $55 billion (IMF). Although there were a few ups and downs (for example, a 12% fall in 1992, and another 8% fall during the Asian Financial Crisis of 1997-1998), remittances to India grew at a fast pace during 1990 to 2010, reaching an average yearly growth rate of about 18%. This growth included a 60% growth from 1995-1997 and another surge of almost 50% from 2001-2003 while India experienced a recession. Remittance receipts doubled from 2005 to 2008 preceding a slight decline during the global recession of 2008. In 2010, India's per capita remittances were about $47 surpassing only the per capita remittances received by Maldives (about $11) among all its South Asian neighbors. In 2010, the share of remittances to GDP in India was 3.6%. Currently, this share has increased to about 4% with about 70b remittances. India receives its international remittances primarily from countries in the Middle East, and also from countries with which it shared a colonial history, such as the United Arab Emirates, Kuwait, the United States, UK, Canada and Australia.

[5] As explained in the previous section we are looking into all migrant households which means that each household in our sample has at least one migrant. The reason for migration is to take advantage of economic opportunity in the destination country or the earning gaps between the origin and destination. This fits well into each household's objective of utility maximization. See Lucas and Stark, 1985; and Stark, 1991.

[6] Consider a household that maximizes its utility that depends on a vector of goods (x) and leisure(l) used by the household. Then the household maximizes $W = U(x, l)$ (1) subject to the full income constraint $\sum_{g=1}^{G} p_g\, x_g \leq I + R$ (2) Here U denotes the utility; x_g denotes amounts used of g goods; p_g denotes the prices of those goods; I $(= \sum_i w_i\,(T - l_i))$ is the earned income of all the individuals i in the migrant household that doesn't count migrant income and R is the remittance receipt. Assume that the utility function is separable in consumption and leisure and wage rates, time endowment and prices are

demand functions in the budget share form (i.e., the expenditure share of each good in the total household expenditure) to have our primary estimating equation as $b_g = \beta_{0g} + \beta_{1g}R + \beta_{2g}Z + \varepsilon_{ig};\ \forall g$ where b_g is the share of household investment expenditure in the total household expenditure, β_{1g} is the effect of R (remittances) on b_g and Z denotes a set of household and migrant characteristics that affect the share of the investment expenditure in the total household expenditure.

This enables us to see how different factors together with remittances have affected the probability of investment and the amount of investment by the remittance receiving households. We expect that remittances would have positive impact on both of them. The Z vector includes some of the household characteristics like family size, presence of young children, presence of unemployed person (s) in the household, the age, gender and education of the head of the household, household income and asset holdings and ownership of bank accounts by the households. We expect the size of the household, the presence of unemployment and young children to generate negative effects and the age and education of the head of the household, ownership of bank account, household income and asset holding to have positive impacts. We also investigate how migrant characteristics like migrant education or income, migration duration, migrant's age and marital status and migrant occupation affect the household investment behavior. Migrant's education and income are expected to have positive effects and migrant's age and marital status may generate negative effects.

Issue with Censored Observation

Since not all remittance receiving households in our sample have engaged in investment undertakings, we observe zero investment for some households and positive amount of investment for others which generate a mixture of discrete and continuous distribution. The literature provides different techniques for estimation with this type of data set. We have chosen the Tobit model as a preferable way to estimate our equation.[7]

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exogenously given. Equation (1) and (2) can be used to obtain demand functions for each good g as follows: $\{x_g\}_{g=1}^{G} = x_g(I, R, p)$ (3).

[7] One of the techniques suggests to first estimate the decision to invest with a Probit model and subsequently estimate how much to invest using Ordinary Least Square (OLS) with a term (the inverse Mills ratio of the probability calculated in the first stage) to correct the sample selection bias. However, this approach requires us to use different sets of variables for two estimations (Probit and OLS). In other words, there must be some identifying covariates to separate the Probit model from the OLS model. Hoddinott (1992, 1994), Frankenhouser (1995) Cox et al. (1998) along with quite a few other scholars have used this technique. However, it may be difficult to come up with identifying variables that would affect the probability of investment without affecting the amount of investment. Furthermore, the results become sensitive to the choice of identification exclusions. The alternative used by quite a few other researches (Brown 1997, Ravallion and Dearden, 1988, and Basu and Bang, 2011 & 2014) is the Tobit model. The

Issue with Endogeneity of Remittances and Investment

A remittance receiving household's decision to investment may be influenced by the amount of remittances it receives or remitters may be tempted to remit more to reward the investment propensity of the households. To deal with this endogeneity issue, we need to have an instrument for remittances. The literature suggests to choose a variable that would affect migrants' decision about sending remittances without having any effect on the decisions of remittance receiving households.

Our data set has information for a variable (i.e., direct deposits to NRRA by the migrant) that is expected to reduce the cost of sending remittances and thus would affect remittance payments positively.[8] We have chosen this variable instead of choosing wage or employment as our instrument.[9] The lower cost for sending remittances boosts remittances like favorable wage or favorable employment opportunity in the destination country. However, like wages and employment in the destination country, this is not expected to affect the investment behavior of the remittance receiving household[10] The first stage results show that it has explained remittances well.[11] The test for endogeneity is shown in section 5.

The dependent variable for the analysis of investment is the share of investment expenditure in the total expenditure of the household. To start with, we

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Tobit model allows to estimate the quantity invested together with the likelihood of investing using the same covariates. The disadvantage is that the likelihood of investing and the amount invested would be affected in a similar way (Wooldridge, 2013). However, it is difficult to find suitable identifiers that affect the decision to invest without affecting the amount invested and the results are sensitive to the choice of identifiers. So Tobit analysis seems preferable. In writing the Tobit model we use Y for b_g and R and Z are included in the X vector. The Tobit model we estimate is presented by
$Y_i^* = X_i'\beta + \varepsilon_i$ with $Y_i = \max(0, Y_i^*)$ and $\varepsilon_i \sim N(0, \sigma^2)$.
Y_i^* is the latent investment, X_i' represents the vector of exogenous variables presenting remittances, household characteristics and a few migrant characteristics.

[8] Irrespective of their remitting habits, all migrants (i.e., both remitting and non-remitting migrants) are eligible for opening this account with a small cost or in most cases without any cost. Migrants who want to remit through this account can then write a check (in Rs.) on this account and send that to their family. Thus, migrants either have transferred money without any cost or transferred it with a significant reduction in cost.

[9] Usually the wages or earnings or employment rates in the host country or anything else that facilitates remittance payments can be used as an instrument. However, the wage and employment data in our sample are not suitable for instruments. For quite a few migrants this data set doesn't mention the host country, rather it shows which continent the migrant has moved to. For example, for some migrants we only know whether a migrant has gone to Africa or Western Europe, etc., but we don't know which country in Africa or Western Europe he has moved into. Relevant table could be made available if requested. The destination wage or employment of a migrant can't thus serve as an appropriate instrument for our data set.

[10] To make sure that NRRA held by the migrant has not impacted the investment behavior of the remittance receiving household, we have looked into modes of remittance transfer; our sample shows that remitting migrants even with the ownership of a NRRA have chosen different modes of remittance transfer and sometimes these modes have excluded NRRA.

[11] See A1 in the Appendix for the first stage regression and robustness checks for identification issue.

measure investment expenditure as the sum of expenditures on health, education, buying land, stocks, bonds, and other financial assets, and investment in business. Since expenditure on health may be due to the health shocks, we have checked results when health expenditure is excluded from total investment expenditure and also when both health expenditure and education expenditure are excluded.

Description of Data

The data we use come from a survey by Reserve Bank of India in 2009-2010 on private remittances to India for 2007-2008 and 2008-2009. Three thousands households were randomly chosen from nine districts of India.

The objective of the survey is to identify the economic profile of the remittance receiving households, the source, mode and usage of remittances. The survey questionnaire has asked detailed questions about household composition, demographic and socioeconomic information of each member of the household and existing household assets and liabilities.[12] Table 1 gives the descriptive statistics of these variables.

As we can see from Table 1, the households have received over 430,000 Rs. over the year as remittances over half of which comes from the direct deposits to NRRA.[13] The households on average have accumulated a decent amount of net asset. More than two bank accounts are held by the households on average. The average size of the households is not very big in our sample; the head of the household is about 50 years of age and the migrants mostly are very close to 40 years of age with roughly seven years of education on average. They are also mostly male leaving the woman of the family to head the households. Not many households have children of school age. The duration of migration is about 10 years on average. Software and entrepreneurship are the two preferred occupations for the migrants. The gender variable is a dummy with 1 for male and 2 for female. Thus a value above 1 means that there are female heads of the household and some of the migrants are female members. Occupations are used as dummy variable and their average values show which occupations were preferred.

[12] Another useful category of information is the breakdown of total household expenditure, e.g., how much is spent on food, or health or education or buying a piece of land or maintaining or starting a business. A similar breakdown is available for usage of remittances although we could not use it because of a large number of missing values.

[13] We use remittances amount of 2008

Table 1. Descriptive Statistics for Variables Used

Variable	Mean	Std. Dev.
Amt. remitted	Rs.430246.300	439452.000
Direct deposits to NRRA	Rs.258376.2	322293.900
No. of bank account	2.426	1.715
No. of school-aged children	0.368	0.696
Net asset	Rs.5133633	6522450.000
Household size	3.304	1.379
Household Head's education	5.290	1.484
Household Head's age	49.258	14.192
No. of unemployed	0.821	0.383
Migrant's age	37.217	9.205
Migrant's education	6.676	1.633
Migration duration	9.654	6.747
Immobile asset	1.272	0.470
Mobile asset	Rs.1530.009	76189.580
Migrant's marital status	0.868	0.338
Migrant's income	Rs.707520	779720.700
Occup. Software	0.040	0.195
Occup. Seaman	0.012	0.107
Occup. Entrep	0.161	0.367
Household Head's gender	1.462	0.499
Migrant's gender	1.080	0.271
Urban	0.553	0.497

Results

As mentioned in our estimation strategy, the objective of this research is to examine how remittance receipts, household characteristics and migrant characteristics have affected the household investment behavior. In examining those effects we would also compare the overall role of household characteristics with that of migrant characteristics.

We first present estimates from Ordinary Least Square (OLS) and then from Two-stage Least Square (2SLS) technique to mitigate the problem of endogeneity and finally show results from IVTobit to take care of both the endogeneity issue and the problem associated with the mixed distribution of the data. For each of these techniques we have used three specifications. First we estimate with household characteristics only (HH); next we use characteristics of individual migrants only (IND), and lastly we use both the household and individual characteristics (HH and IND). To save space and keep our focus, we present results with the last specification (i.e., with both household and migrant characteristics) in Table 2.

Column 2 of Table 2 presents results of OLS, column 3 and 4 present results of 2SLS and IVTobit. The qualitative (sign) and quantitative (size) components of the estimates are very similar for all three techniques and for most of the variables, although the statistical significance vary in a few cases. However, it is worth mentioning that for both OLS and 2SLS, there were anomalies for some of the household characteristics and migrant characteristics when we have switched to the third specification that uses all characteristics. These anomalies disappear for the IVTobit estimation. Our main outcome variable namely the effect of remittances show a strong positive impact on household investment expenditure although it shows a small effect (less than a percentage point). However, considering the amount of remittances received, it has important implications.

It is reasonable to think that the net asset holdings of a household would affect its investment behavior. Ownership of assets means that households are already engaged in investment activities and most probably are aware of the importance of investment. It should be noted that when we pay attention to both the endogeneity issue and the selection problem, the effect of Net assets confirms our expectation irrespective of which specification we use. The age and education of the head of the household do not have any impact on the household investment expenditure. Bigger size households and households with more school children invest more (one and two percentage point increase respectively) probably because they want to build a better future for their children.

This favorable effect of household size holds when we interact household size with net assets. Bigger households are expected to have more children. The results for household size and the number of school aged children thus look very consistent. Usually, bigger size households are expected to have high consumption expenditure dampening the investment expenditure. However, that is not the case for our sample. The effect of Household income is positive and statistically significant.[14]

Only two household characteristics, namely the presence of unemployed member in the households and the number of bank accounts held by the households have negative effects. The effect of the presence of unemployed member is expected since that reduces household's income and the ability to invest. However, the result for the ownership of bank account contradicts some findings in the literature.

[14] We have estimated the equations with and without a quadratic term for the household income. The square of Household income has a negative impact in Table 2. To save space we report the results without the quadratic term from Table 3. Results using the quadratic term can be made available if requested.

This data set not only reports assets and liabilities of the households but it also gives detailed breakdown of the movable and immovable assets. While movable assets like auto-rickshaw, two or four wheeler give greater flexibility to take advantage of new investment opportunities in a place different from the current residence area, immovable assets like land or any other form of real estate may be more valuable to build up investment capabilities (enough financial resources that help to invest). In our analysis we see that movable assets are effective in boosting investments (increases investment by almost seven percentage point); however, that is not the case with the immovable assets. Net assets defined as the assets net of liabilities show statistically significant positive effect (only .5% of our households had negative net asset).

Focusing on migrant's characteristics only, we see that all the variables have statistically significant effect except migrant's education level, migrant duration and two types of occupation. Usually, migrant's income is expected to be higher if migrant has a higher level of education. Our data suggest that about 70% of our migrants have at least a high school degree. However, migrant's income has negative effects in our analysis. Both higher level of education and higher income increase migrant's ability to support himself and migrant as a result become less dependent on his family back at home and does not feel like sending remittance as a premium for insurance from the family in case of a future turmoil. This is a plausible explanation of the negative effect of income and it hints to the insurance motive for sending remittances and not the altruistic motive (Gubert, 2003).

Migrants are expected to send less remittance when they have their spouses and children with them because they may not have close ties with their family back at home in this situation and sometimes they can't afford to send remittances after providing for their spouses and children. This supports the negative effect of marital status in Table 2. However it is significant only at 10% level. The literature on remittances has explained both positive and negative effect of migration duration (Dustmann et al., 2002). Usually, longer the migrant duration, one may expect more household investment expenditure. It suggests that more acclimation to the host country may imply more secured feeling by the migrant to help families back at home and that may boost household investment; however it is not statistically significant when we try both household and individual characteristics.

Information about the occupation of the migrants has helped us to show whether the occupation of migrant has shaped the investment sentiment of the migrant household. Two occupations that migrants like most in this sample are entrepreneurship and jobs related to software. Following the data, we have grouped the occupations into five categories (each presented by a dummy) and used entrepreneurial jobs as the base occupation. It should be noted that the

Table 2. Comparison of Estimates of Household Investment Expenditure

	HH + Ind		
Variable	OLS	2SLS	Tobit
Amount remitted	0.001***	0.001***	0.001 ***
	(0.000)	(0.000)	(0.000)
No. of bank account	-0.019***	-0.025***	-0.025 ***
	(0.002)	(0.002)	(0.002)
No. of school-aged children	0.019***	0.017***	0.017 ***
	(0.004)	(0.004)	(0.004)
Net asset	0.001 ***	0.001 **	0.001 ***
	(0.000)	(0.000)	(0.000)
Household size	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)
Household Head's education	0.001	-0.002	-0.002
	(0.002)	(0.002)	(0.002)
Household Head's age	0.001 **	0.002	0.002
	(0.000)	(0.000)	(0.000)
No. of unemployed	-0.019***	-0.021***	-0.021 ***
	(0.006)	(0.007)	(0.007)
Net asset * Household size	0.001 *	0.001**	0.001 **
	(0.000)	(0.000)	(0.000)
Immobile asset	0.041**	0.033	0.032
	(0.020)	(0.020)	(0.02)
Mobile asset	0.054 **	0.065***	0.065***
	(0.023)	(0.023)	(0.023)
Household Head's gender	0.007	0.010	0.01
	(0.006)	(0.007)	(0.007)
Urban	0.002	0.002*	0.002
	(0.005)	(0.005)	(0.005)
Household Income	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Square of Household Income	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Migrant's age	0.002 ***	0.002***	0.002 ***
	(0.000)	(0.000)	(0.000)
Migrant's education	0.003	0.001	0.001
	(0.002)	(0.002)	(0.002)
Migration duration	0.001	0.001	0.002
	(0.000)	(0.001)	(0.001)
Migrant's marital status	-0.011	-0.013*	-0.013*
	(0.008)	(0.008)	(0.008)
Migrant's income	-0.001 ***	-0.001 ***	-0.001 ***
	(0.000)	(0.000)	(0.000)
Migrant's Occu. Software	-0.002	0.010	0.008
	(0.014)	(0.014)	(0.015)

Table 2. Continued.

Migrant Occu. Farmer	-0.063	-0.046	-0.046
	(0.163)	(0.165)	(0.166)
Migrant Occu. Seaman	0.101***	0.106***	0.106***
	(0.024)	(0.025)	(0.025)
Migrant Occu. Selfemp	0.056***	0.059***	0.059***
	(0.10)	(0.01)	(0.01)
Migrant's Occu. other	-0.030 ***	-0.027***	-0.027***
	(0.007)	(0.008)	(0.008)
Migrant's gender	0.024 ***	0.030***	0.030***
	(0.009)	(0.009)	(0.009)
R-squared	0.1629	0.1362	
Wald chi2		693.02	687.36
Prob>chi2		0	0.000
Log likelihood			-65849.3
Number of observations	4795	4792	4792

Notes: Dependent variable is the share of the household's investment expenditure in total expenditure. All monetary variables are in Rupees. Estimating equation is given by (1). Robust standard errors are in parentheses. Significance: *** p<0.01; ** p<0.05; * p<0.1.

majority of these migrants has moved to the oil rich countries of the gulf area. Although employment in software industry or as entrepreneurs are two major occupational categories for this data set (in the sense that the majority of the migrants are employed in these occupations), the US has attracted a majority of entrepreneurs. Thus, for our sample, we see that self-employed migrants and migrants who worked as Seamen have consistently affected the investment behavior more positively than any other occupation. Occupations related to software industry don't have much effect on investment behavior when compared with entrepreneurship.

The coefficients of column 4 in Table 2 presenting the results from IVTobit estimation measure the partial effects of changes in our independent variables on the expected value of the latent variable Y_i^*. However, the variable we would like to understand better is the observed investment (Y_i). In addition, our objective is to investigate how remittances, other household characteristics and migrant characteristics affect the likelihood of investment and the amount of investment. Therefore, Table 3 presents the effect of our independent variables on the probability of investing (column 3) or $\partial P\ (Y_i > 0|X_i)/\partial X_i$) as well as the information on the sensitivity of volume of investment to changes in the explanatory variables i.e.,$\partial(E(Y_i|Y_i > 0, |X_i)/\partial X_i$ (in column 4). For convenience of the readers, we also present column 4 of table 2 (effect on the latent variable) as our column 2 in Table 3. We see that all the results from the last column of Table 2 (where we combined both household and individual

characteristics) hold good except that immobile assets like the mobile assets affect both the probability of investment and the amount of investment positively.[15]

Robustness of Results

Although our first stage regression shows that our instrument explains the endogenous variable well, in order to see whether there could be additional issues involving endogeneity, we have tested for endogeneity with the null hypothesis that variables are exogenous. The Durbin (score) with X^2 (1) is 17.67 (pvalue = 0) and the Wu-Hausman F(1, 4854) = 17.68 (pvalue =0). The F (1, 4854) statistics for the first stage regression (1798.24) exceeds the critical value of 16.38 (for nominal 5% Wald test) for the null hypothesis that instrument is weak. Sargan statistics shows that the equation is exactly identified. In addition, while using Sargan statistics we also have checked whether the instrument "directnr" or "migrant's direct deposits to NRRA" is endogenous to itself. The results shows a X^2 (1) with p-value as zero.

It is expected that the remittance behavior of those who have used NRRA as a mode of remittance transaction could be different from the remittance behavior of those who haven't used NRRA as a mode of remittance transaction. To look into it, we have divided the sample into these two groups and used OLS to check the behavior of the variable "Amount remitted" for each group separately.[16] The effect of remittance receipts remain the same irrespective of these characteristics.

Investment expenditure in our analysis includes expenditure on health, education, buying land, stocks, bonds, and other financial assets, and investment in business. The data set does not say anything about whether the health expenditure includes expenses for health shocks. Since expenses covering health shocks may have affected the result, we have checked Tobit estimates after excluding health expenditure from investment expenditure. We have also checked estimates when expenditure on both health and education are excluded. All results hold good.

Discussion and Conclusion

Economic reason for migration is the income difference between the labor sending and the labor receiving countries. The labor sending countries usually

[15] The household expenditure is influenced not just by the amount of household income but also by the position or location of that income in the entire income distribution chart. We therefore have estimated the effects by income quartiles and remittance quartiles. Results show that effects vary considerably.

[16] We could not use IVTobit or 2SLS for this comparison because the variable, directnr, is not available for those who didn't use NRRA for remittance transfer. Note that all migrants whether they remit or not, can open NRRA. Even when they have access to NRRA they don't have to remit through NRRA.

try to close the gap by promoting higher rate of growth through higher level of investment. In the absence of properly functioning capital and credit market, remittances can be a suitable vehicle to increase investment. To encourage investment performance of the remittance receiving households, the policy makers need to know which factors can impact the investment behavior of remittance receiving households.

Table 3. Tobit Estimates of Household Investment Expenditure with Partial Effects

Variable	Coefficient	Partial effect on the prob. of inv.	Partial effect on the expected amount of inv.
Amount remitted	0.001***	0.001	0.001
	(0.000)	(0.000)	(0.000)
No. of bank account	-0.024***	-0.009***	-0.016***
	(0.002)	(0.001)	(0.002)
No. of school-aged children	0.014***	0.008 ***	0.015 ***
	(0.004)	(0.002)	(0.003)
Net asset	0.001**	0.001 ***	0.001 ***
	(0.000)	(0.001)	(0.000)
Household size	0.009 ***	0.004 ***	0.007 ***
	(0.002)	(0.001)	(0.002)
Household Head's education	-0.002	-0.001	-0.002
	(0.002)	(0.001)	(0.002)
Household Head's age	0.002	0.001	0.002
	(0.000)	(0.000)	(0.000)
No. of unemployed	-0.025***	-0.010***	-0.019 ***
	(0.007)	(0.003)	(0.006)
Net asset * Household size	0.001 ***	0.001 ***	0.001 ***
	(0.000)	(0.000)	(0.000)
Immobile asset	0.037*	0.020**	0.037 **
	(0.020)	(0.009)	(0.017)
Mobile asset	0.063***	0.025**	0.045 * *
	(0.023)	(0.011)	(0.019)
Household Head's gender	-0.002	-0.001	-0.002
	(0.007)	(0.003)	(0.005)
Urban	0.002	0.001	0.001
	(0.005)	(0.002)	(0.004)
Household Income	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Migrant's age	0.002 ***	0.002 ***	0.002 ***
	(0.000)	(0.000)	(0.000)
Migrant's education	0.002	0.002*	0.003*
	(0.002)	(0.001)	(0.002)

Table 3. Continued.

Variable	Coefficient	Partial effect on the prob. of inv.	Partial effect on the expected amount of inv.
Migration duration	0.002	0.002	0.002
	(0.000)	(0.000)	(0.000)
Migrant's marital status	-0.013	-0.005	-0.009
	(0.008)	(0.004)	(0.006)
Migrant's income	-0.001 ***	-0.001	-0.001 ***
	(0.000)	(0.000)	(0.000)
Migrant's Occu. Software	0.010	-0.002	-0.002
	(0.015)	(0.007)	(0.012)
Mirgrant's Occu. Farmer	-0.041	-0.027	-0.049
	(0.168)	(0.076)	(0.14)
Migrant Occu. Seaman	0.088***	0.042 ***	0.076***
	(0.025)	(0.011)	(0.021)
Migrant Occu. Selfemp	0.053***	0.024***	0.044 ***
	(0.010)	(0.005)	(0.008)
Migrant Occu. other	-0.034***	-0.016 ***	-0.030 ***
	(0.008)	(0.004)	(0.006)
Migrant's gender	0.035***	0.013 ***	0.024 ***
	(0.009)	(0.004)	(0.008)
Wald chi2	626.03		
Prob>chi2	0.000		
Log likelihood	-66006.5		
Number of observations	4792	4792	4763

Notes: Dependent variable is the share of the household's investment expenditure in total expenditure. All monetary variables are in Rupees. Estimating equation is given by (1). Robust standard errors are in parentheses. Significance: *** p<0.01; ** p<0.05; * p<0.1.

This paper provides some insights for that purpose. It is especially useful for a country like India which is one of the largest recipient of international remittances and also for which no study has been done so far either for the investment use of remittances or for the investment expenditure behavior of remittance receiving households. This paper shows that the size of the remittance receiving households, number of young children in those households, net asset holding of the household and asset types, education, age and marital status of the migrants sending the remittances are the factors which can impact investments.

For example, government programs can create incentives for older migrants to have more remittance transfers. Remittance money used for children's education could be matched to create robust flow of educational investments. Since asset holding encourages more asset building, the government can come

forward with onetime interest rate subsidy for borrowing money or onetime lump sum subsidy for down payment used to build up asset. Furthermore, a single policy may not be effective for all households since effects vary by income quartiles and remittance quartiles. In implementing policies for boosting remittance flow and investment expenditure of remittance receiving households, policy makers should take that into consideration. The findings not only provide directions for the policy makers but it gives suggestions for the researchers as well to decide how to move forward to provide more insights into the analysis of how remittances can affect the investment expenditure of remittance receiving households.

More insights we have about our migrants and migrant households, the better off the country would be in providing training for them and in planning for appropriate assimilation of the migrants when they return. The government can also engage directly in building up migration corridors to have favorable job contract for migrants, to reduce cost of migration and to boost the flow of foreign funds in the form or remittances. In addition, the limitation of this study is the relatively small size of the data set. Future research should take care of all the relevant issues with a bigger dataset.

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Appendix

Table A1. First Stage Estimates for Investment Expenditure of Remittance Receiving Households

Variable	HH + Ind
Direct deposits to NRRA	0.726***
	(0.037)
No. of bank account	56128.79***
	(3759.249)
No. of school-aged children	35377.49**
	(14230.7)
Net asset	0.01***
	(0.003)
Household size	-8001.616*
	(4099.816)
Household Head's education	6028.909
	(4099.731)
Household Head's age	223.296
	(461.768)
No. of unemployed	30051.430***
	(10391.16)
Net asset * Household size	-0.002***
	(0.000)
Immobile asset	72713.230***
	(13552.28)
Mobile asset	-95068.990**
	(46356.95)
Household Head's gender	777.261
	(22962.88)
Urban	943.067
	(9587.605)
Migrant's age	767.547
	(1049.713)
Migrant's education	21174.230***
	(4811.709)
Migration duration	-909.0192
	(916.039)
Migrant's marital status	19192.890**
	(8870.245)
Migrant's income	0.075***
	(0.021)
Migrant's Occu. Software	-110690***
	(21688.85)
Migrant's Occu. Seaman	-9219.91
	(61610.56)
Migrant's Occu. Selfemp	-24903.74*
	(12873.61)
Migrant's Occu. Other	-13144.42
	(12313.5)
Migrant's gender	-65340.48***
	(13322.32)
R-Squared	0.35
Number of Observations	4791