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Great Expectations? Remittances and Asset Accumulation in Pakistan

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Abstract

This study examines asset accumulation patterns of the recipients of foreign and domestic remittances. Using the representative 2010-11 Pakistani households' survey and employing a number of matching routines, we analyse stocks of consumer, productive, housing and financial assets among migrants' stay-behind households. We find that asset accumulation among remittance-receiving households depends upon the nature and magnitude of remittances as well as the economic situation and geographical location of the recipient households. Foreign remittances lead to a substantial increase in household assets while no significant change results from domestic remittances. Households receiving foreign remittances hold a higher stock of assets for all categories of assets, even though the increase in productive assets is low. Moreover, rural and poor recipients of foreign remittances accumulate more assets than their non-recipient counterparts. Asset accumulation also increases with the amount of remittance received. Findings show that foreign remittances are considered as a mainly transitory income, and are used to generate precautionary savings in cash and kind.

Keywords: Foreign remittances; Domestic remittances; Asset accumulation; Pakistan
JEL Codes: F24; I2; O15; O53.

1. Introduction

Sending a member away from home is a substantial investment undertaken by the migrant household, whose ensuing monetary returns provide the household with an additional source of earnings. These migrant remittances diversify the household's income portfolio and improve its standard of living. Research on remittance flows to developing countries has revealed the uses of these transfers and their impact on household welfare. Remittances lead to significant changes in the household consumption patterns. In some cases, they lead to higher marginal shares of food and consumer goods (Adams and Cuecuecha, 2010a; Chami, Fullenkamp and Jahjah, 2005; Clément, 2011), while in others the remittances help the households improve their education and healthcare outcomes and provide capital for productive investments (Adams, 1998; Adams and Cuecuecha, 2010b; Amuedo-Dorantes and Pozo, 2011; Taylor and Mora, 2006).

The latter finding suggests that remittances are mainly considered as a temporary source of income by the migrant households (Ahmed and Mughal, 2015). If this conclusion is valid, then this migrant households' consumption behaviour should also be reflected in their asset accumulation patterns[1]. Temporary or irregular income receipts are therefore more likely to be saved or invested, while permanent income is spent on regular, scheduled expenditures (Friedman, 1957; Ando and Modigliani, 1957). The resulting stock of assets and monetary savings should serve as a cushion against health risks, natural catastrophes, economic downturns and other exogenous shocks.

Extant literature lacks consensus on the use of remittances for asset accumulation by the migrant households. Studies from Albania (Nicholson, 2001), Mexico (Chiodi et.al, 2012), Pakistan (Adams, 1998), Thailand (Garip, 2014) and the Philippines (Quisumbing and McNiven, 2010) find evidence of higher productive assets resulting from remittances. Osili (2004) finds that remittances to Nigeria lead to a substantial improvement in housing assets. On the other hand, evidence from Ethiopia (Andersson, 2014), Pakistan (Lefebvre, 1999) and Sri Lanka (Prabal and Ratha, 2012) favour the pessimistic assessment that remittances do not lead to the accumulation of productive assets.

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[1] Household assets refer to the set of material belongings, financial resources and intangible assets including the household's accumulated human capital.

These conflicting conclusions raise a number of questions:

Do such positive (negative) views hide a more nuanced image when assets are disaggregated into various subcategories (e.g. durable goods, housing, financial assets and productive assets)?

Does this remittance behaviour extend to both forms of remittances, i.e. foreign and domestic?

Do recipient households in the rural areas acquire assets in the same way as the urban households do?

Are asset accumulation patterns of households living below the poverty line similar to those of the non-poor households?

Does the amount of remittances influence asset holdings of the recipient households?

This study seeks answers to these questions by analyzing a representative household survey carried out in Pakistan in 2010-11. We find that the asset accumulation patterns do vary with respect to the type of remittance received, the kind of assets involved, the region of residence of the households, and the income level of the recipients. The welfare effects of remittances are therefore contingent upon the nature and magnitude of remittances as well as the economic situation and geographical location of the recipient households.

The remainder of the study is organized as follows: The next section provides a quick overview of related literature. Section 3 describes the socioeconomic profile of the migrant households and shows bivariate statistics on remittances and household assets. Empirical methodology is presented in Section 4 followed by the study's key findings in Section 5. The penultimate section gives the sensitivity and robustness checks undertaken. Conclusions follow.

2. Remittances and asset accumulation - a brief literature overview

Of late, researchers have increasingly focused on assets to understand household welfare and development outcomes in the developing countries. Assets are easier to measure and do not face recall and measurement issues that plague the other welfare indicators. They provide a useful tool to assess the stock of resources available to the household, thereby reflecting the household's long term welfare situation. The more assets people have, the less vulnerability and insecurity they experience in the face of risks, insecurity, and violence (Moser, 1998). Therefore, the migration process and the monetary and in-kind transfers that follow can be expected to raise the migrant household's asset stock. In the presence of imperfect capital markets and credit constraints,

remittances serve as a means to accumulate productive assets, which in turn generate income and savings for the household (Chiodi et.al , 2012; Taylor, 1999). For instance, remittances are reported to be used for purchasing machinery for small-scale family enterprises, livestock and agricultural equipment for farms, as well as land and commercial property for new businesses (Adams, 1991; Dustmann and Kirchkamp, 2002; Nicholson, 2001; Taylor, 1992; Woodruff and Zenteno, 2004). Along with agricultural and commercial land, housing and real estate are one of the migrant remittances' important uses (Findlay and Samha, 1986; Osili, 2004). Egyptian migrant households, for instance, use remittance money to replace their crowded and traditional mud-brick houses with modern red brick buildings (Adams, 1991). Houses constructed for self-consumption improve the household's living conditions, while land and property serve as a relatively secure avenue for investment accessible to households in countries with underdeveloped financial markets.

On the other hand, migration is an expensive joint-venture whose costs include foregone consumption and household labour. Migrant households can therefore also be expected to enjoy the fruits of this investment by purchasing more consumer items and labour-saving goods. This could explain the evidence for higher consumer asset accumulation coupled with no significant productive asset accumulation among migrant households (Adams and Cuecuecha, 2010a; Andersson, 2014).

The aforementioned conflicting evidence could be due, in part, to the kind of assets examined, the income level of the households, and the type of remittances. Prabal and Ratha (2012), for example, find that remittance income contributes to an increase in human capital accumulation among Sri Lankan children, even if there is no evidence that it leads to higher physical asset accumulation among the recipient households. Adams and Cuecuecha (2010a) report that households receiving international remittances in Indonesia are poorer than other types of households, and thus tend to spend their remittances at the margin on consumption rather than investment goods.

In contrast, Garip (2014) shows that rich Thai households lose productive assets with migration, potentially due to the reduction in the labor force available to maintain local economic activities, while poor households gain productive assets.

Adams (1998) finds that external remittances have a much more important influence than internal remittances do on the accumulation of physical assets in rural Pakistan. Being a recipient of foreign remittances is positively associated with ownership of irrigated and rain-fed land, whereas internal remittances do not have a positive and statistically significant impact on the accumulation of any rural assets. Adams explains this difference by the fact that agricultural land is highly valued in rural Pakistan and is therefore inaccessible to the recipients of lower average internal remittances compared with higher foreign remittances. However, investment on livestock or non-farm assets does not seem to increase with remittances, possibly due to lower returns to these assets. Lefebvre (1999) and Watkins (2003), in contrast, report no productive asset accumulation resulting from remittances, as most of it is spent to cover the recipient households' basic necessities.

3. Data description

This study is based on the 2010 - 2011 round of Pakistan Social and Living-Standards Measurement Survey (PSLM). The survey is carried out on a sample of 16,341 households' representative of the country's population at the national and urban/rural level. Villages are taken as primary sample units in rural areas while urban sampling is based on enumeration blocks. Households in each of the 1,180 sampled villages and enumeration blocks are considered secondary sampling units, and a sample of 16 and 12 households is respectively selected from each village and urban enumeration block for this purpose. The survey collects data on household income, consumption, wealth, social and demographic features, savings, and work of the households.

Table 1. Profiles of remittance recipient and non-recipient households

Variable	HH with no Foreign Remittances	HH with Foreign Remittances	Two sample t-test	HH with no Domestic Remittances	HH with Domestic Remittances	Two sample t-test
Demographic indicators						
Age of head	46.26	48.82	4.01	46.03	49.47	6.86
Household size	6.36	6.82	-2.82	6.45	5.80	6.04
Dependency ratio	0.49	0.54	4.53	0.49	0.54	6.32
Education of head (completed years)	8.89	8.33	-2.70	8.95	7.88	-6.77
Sex of head	0.07	0.43	16.11	0.06	0.40	20.27
Work status of head	0.83	0.43	-17.21	0.85	0.48	-19.87
Economic indicators						
Total Income including remittances	188380.80	356659.70	4.21	199682.80	179065.10	-3.35
Income per capita including remittances	33107.56	62340.11	2.93	34814.17	33646.01	-0.93
Local economic conditions	-0.34	0.07	10.63	-0.31	-0.36	-1.97
Households economic condition	-0.22	-0.05	5.90	-0.21	-0.22	-0.47
Location indicators						
Resides in Punjab	0.41	0.37	-1.47	0.43	0.25	-8.66
Resides in urban areas	0.35	0.25	-3.86	0.36	0.19	-10.80

Table 2. Household assets by access to remittances

	HH with no Foreign Remittances	HH with Foreign Remittances	Two sample t-test	HH with no Domestic Remittances	HH with Domestic Remittances	Two sample t-test
Durable assets						
Iron	0.72	0.94	14.84	0.72	0.79	4.37
Electric Fan	0.89	0.95	4.88	0.89	0.92	1.68
Radio	0.16	0.28	5.16	0.17	0.15	-1.48
Chair	0.63	0.93	22.98	0.64	0.73	5.54
Watch	0.77	0.96	17.07	0.78	0.8	1.64
TV	0.55	0.72	7.18	0.56	0.54	-0.9
Air Conditioner	0.05	0.1	4.22	0.05	0.03	-4.48
VCP	0.05	0.09	3.63	0.05	0.04	-1.31
Refrigerator	0.37	0.72	17.23	0.39	0.38	-0.26
Air Cooler	0.06	0.15	5.55	0.07	0.07	0.12
Computer	0.07	0.16	5.82	0.07	0.07	-1.07
Bicycle	0.28	0.28	-0.03	0.28	0.26	-1.09
Motorbike	0.24	0.27	1.51	0.25	0.17	-6.27
Car	0.04	0.07	2.85	0.04	0.02	-4.01
Mobile phone	0.77	0.92	12.04	0.78	0.76	-1.84
Cooking Range	0.02	0.06	2.91	0.03	0.02	-1.4
Burner	0.37	0.49	4	0.39	0.27	-7.1
Washing Machine	0.42	0.77	15.72	0.44	0.39	-2.84
Sewing machine	0.53	0.8	14.62	0.54	0.57	1.88
Housing Quality						
Ownership	0.85	0.91	4.81	0.85	0.9	-4.13
Number of Rooms	2.24	3.12	17.39	2.27	2.45	4.67
Roof Material	2.27	2.83	8.23	2.32	2.13	-4.16
Wall Material	2.66	2.78	3.62	2.66	2.68	0.48
Drinking Source	5.4	5.63	2.67	5.41	5.41	-0.03
Toilet type	3.7	4.49	8.79	3.75	3.69	-0.85
Cooking fuel type	2.96	3.11	2.64	2.99	2.78	-5.52

Lighting Source	2.88	2.95	3.96	2.88	2.93	3.01
Access to telephone	1.83	2.08	11.61	1.85	1.83	-1.02
Water supply	1.95	1.98	4	1.95	1.95	-0.41
Productive Assets						
Tractor	0.02	0.04	1.5	0.03	0.01	-3.08
Commercial Building	0.05	0.05	0.61	0.05	0.03	-2.32
Non Agricultural Land	0.02	0.05	2.7	0.03	0.02	-0.82
Agricultural Land	0.26	0.38	5.11	0.25	0.33	3.72
Livestock	0.28	0.35	2.54	0.28	0.31	1.22
Number of adults with schooling	1.84	2.25	5.1	1.89	1.62	-4.86
Average years of education	6.13	6.49	2.71	6.17	5.96	-1.61
Financial Assets						
Gold	109903.3	195487.4	4.96	116782.1	115771.2	-0.12
Cash Savings	167914	399196.8	1.34	202020.1	140485.5	-1.75

Table 1 compares the profiles of foreign and domestic remittance recipient and non-recipient households. Recipient households show significant demographic, economic and spatial divergence from the non-receiving households. Households receiving foreign remittances are on average larger with a higher number of dependents. Their heads are older and somewhat less educated. 43% of recipient household heads are females compared with 7% of the non-recipient households. This reflects the fact that international migration from Pakistan is overwhelmingly male, and as a result females (usually the migrant's wife) take up additional responsibilities. Only 43% of recipient household heads report working regularly as compared to 83% of the non-recipient heads. A proportionally higher number of recipient households is based in rural areas, while the provincial distribution is not significantly different. Recipient households earn almost twice as much as the non-recipient households, with the per capita income of Rs. 62 thousand compared with Rs. 33 thousand for non-recipients.

Recipients of international transfers also enjoy greater access to durable assets (Table 2). A substantially higher proportion of foreign remittance receiving households possess home appliances such as television sets, refrigerators, washing machines, air conditioners and computers, as well as vehicles such as cars and motorbikes. An interesting exception are bicycles, whose ownership does not significantly vary with the incidence of remittance from abroad. Bicycles are considered a means of transport for the poor in the country, and its use therefore does not increase with income. A higher proportion of households with foreign remittances holds

agricultural and non-agricultural land as well as commercial buildings, and possesses productive assets such as tractors and livestock. Likewise, these households' savings in cash and gold are substantially higher than those of the non-recipient households. 91% of foreign remittance receiving households own a house compared with 85% of the non-recipients. The quality of housing of the recipient households is also superior, with more rooms, better quality roof and walls, and higher access to amenities like toilets, tap water, electricity, natural gas and telephones.

On the other hand, households receiving domestic transfers report poor economic conditions with lower household income and asset holdings compared to the non-receiving households (Table 1). Similar to the foreign remittance recipients, domestic remittance recipient households are mostly rural with high dependency ratios. However, these households are on average smaller than non-receiving households and are located in the Punjab province to a greater degree compared with the rest of the country. The demographic and education profile of their heads is similar to that of foreign remittance receiving households.

The asset endowment of households receiving domestic transfers is mostly comparable to that of the non-recipients, even though non-recipients possess more of certain types of electronic equipment such as air conditioners, washing machines and television sets (Table 2). An exception is sewing machines which are more frequently found among recipient households. Sewing machines are productive tools that allow women from low-income households a source of earning while working from home. Ownership of transport vehicles such as bicycles, cars and motorbikes is more common among non-recipient households. The amount of cash savings is similarly low among domestic remittance receiving households. There is little difference in the ownership patterns of non-agricultural land and commercial property, whereas more recipient households hold agricultural land and livestock. In the same vein, even though more domestic remittance recipients possess their own home compared with the non-recipients (90% as against 85%) and enjoy more space at home (2.45 rooms compared with 2.3 available to the non-recipients), the quality of housing (e.g. roof and wall material, type of toilet, source of drinking water) and facilities available at home (e.g. electricity, water supply and telephone) are similar regardless of the access to domestic remittances.

4. Methodology

4.1. Model and variable selection

We examine the relationship between remittances and household assets controlling for various economic, social, demographic and locational factors. A total of 38 tangible and intangible individual and household assets are considered. In order to fully gauge the extent of asset holdings of the household, both lumpy (e.g. houses, commercial property, cars) and non-lumpy (e.g. electric fans, watches, radio) type of assets are included. Qualitative asset indicators take values in ascending order of the asset quality. For instance, the indicator for toilet availability assigns the highest value to flush toilets connected to sewerage system with flush toilets connected to tanks or open drain, dry raised or pit latrine and no toilet respectively taking lower values.

The assets are aggregated into a unidimensional index by employing the Polychoric Principal Component Analysis. This technique proposed by Kolenikov and Angeles (2004, 2009) uses Polychoric correlation rather than Pearson correlation, and is considered better suited to deal with a mixture of continuous, binary and ordinal data compared to Principal Component Analysis. The first component thereby obtained explains 37 percent of the information common to the constituent variables. A higher value of the index indicates that the household holds more and better quality assets. For example, a household obtaining a high index value is likely to possess a bricked house with adequate sanitary environment, electricity, natural gas for cooking, piped drinking water and hold more physical assets, human capital and financial resources. The composite index is created using Stata's polychoric user routine. For ease of interpretation, the asset index is standardized to take a mean value of zero and a standard deviation of one.

In addition to the aggregate index, assets are combined into four different groups: consumer, productive, housing and financial. Definitions of the four categories are shown in Table 3. Consumer assets include electronic home appliances and transport vehicles, productive assets consist of household's land and commercial holdings as well as livestock and agricultural equipment, while housing assets comprise indicators of home ownership, housing quality and household amenities. Barring agricultural land, tractor and livestock, all assets can be available to both the rural as well as urban households; therefore the same index is employed for both groups

of households. The household's human capital endowment is counted as a productive asset. The number of adults having received some schooling and the household's average education levels proxy for the stock of human capital the household possesses. The financial assets category is composed of the logged sum of the amount of household savings in cash and gold. Other monetary indicators such as borrowings and repaid loans contain few observations and are therefore not included in the index. The list of variables included in each asset category along with their PCA Eigen values are given in Table A1. The consumer durables index is generated using PCA as the indicators for all the constituent assets are binary.

Table 4 gives bivariate relationship between aggregate and category-wise asset indices on the one hand and the two types of remittances on the other. Households receiving foreign remittances seem to possess more assets whereas the domestic remittance receiving households appear to have lower and often insignificantly different asset portfolio compared with their non-recipient counterparts.

Table 3. Description of expenditure categories

Asset category	Description
Housing Quality	Ownership, no. of rooms, roof material (RCC/RBC, steel/cement sheets, wood/bamboo, other), wall material (burnt bricks/blocks, mud bricks/blocks, other), source of drinking water (pipe, motor pump, hand pump, well (open/closed), outdoor tap, river/stream, other), type of toilet (flush connected to sewerage, flush connected to tank, dry raised latrine, pit latrine, other, no toilet), cooking fuel (natural gas, wood, dung cake, other), lighting source(electricity, kerosene oil/diesel/petrol, other), type of telephone (landline and mobile mobile, none,), distance from water supply (near: 0-14 minutes far: 15-60 minutes,)
Consumer Durables	iron, electric fan, sewing machine, radio, chair, watch, TV, VCP, refrigerator, air cooler, air conditioner, computer, bicycle, motorbike, car, mobile phone, cooking range,burner, washing machine
Productive Assets	tractor, commercial building, non-agricultural land, agricultural land, livestock, number of adults with some schooling, average years of education
Financial Assets	Cash savings, amount of gold/jewelry

Table 4. Remittances and household assets: Bivariate statistics

Asset indicators	Households with no Remittances	Households with Remittances	Difference	Two sample t-test
Foreign Remittances				
Total assets	5.31	6.12	0.81	7.43
Housing quality	4.48	5.15	0.67	10.53
Consumer durables	3.95	5.57	1.62	16.42
Productive assets	0.80	1.00	0.20	4.83
Financial assets (millions of Rs.)	0.14	0.33	0.18	2.58
Domestic Remittances				
Total assets	5.39	5.22	-0.17	-1.91

Housing Quality	4.53	4.41	-0.12	-2.32
Consumer durables	4.05	3.97	-0.08	-1.07
Productive assets	0.81	1.21	0.07	1.54
Financial assets (millions of Rs.)	0.16	0.14	-0.01	-1.07

Remittances are primarily taken as a binary variable to indicate whether or not the household received transfers from within or outside the country during the preceding year. Independent variables that control for the remittance - asset holding relationship include economic factors such as the household's per capita annual income (excluding the amount of remittances received), number of working adults at home, the employment status of the household head, and two indicators of the household's subjective evaluation of the local and household economic situations compared with those prevailing in the previous year.

Demographic factors include household characteristics such as the household size and the share of dependents in the household, as well as individual features such as age, sex and marital status of the household head. Moreover, region and province of residence control for the household's geographical location. The region variable takes rural areas as the baseline given that majority of the country's population lives in villages. The province variable takes Punjab as the baseline and compares it with the other three provinces taken together. Punjab is the most populous province accounting for 56% of the country's population.

The subsequent baseline model can be given as:

$$A_{ij} = \beta_i + \gamma_i(\log Y_j) + \delta_i R_j + \sum_j \mu_{ij} Z_j + \varepsilon_{ij} \qquad (1)$$

Where A_{ij} is the dependent variable which alternately takes the standardized index value for total assets and the four asset categories. It represents assets categories i for households j. R_j indicates whether or not the household receives foreign or domestic remittances, Z_j represents the set of household characteristics that can affect assets behaviour and ε_{ij} is the error term. Definitions and means of selected explanatory variables are given in Table A-2 in the appendix. The resulting useable sample contains 5107 observations.

The aforementioned model is also employed to estimate the effect of the amount of remittances received. The dummy variables for the amount of the two types of remittances are constructed by taking the median values of Rs. 170,000 (foreign remittance) and Rs. 60,600 (domestic

remittance) as the cut-off point. In addition to the baseline model, estimations are separately carried out to compare poor and non-poor households as well as rural and urban households. A household earning less than $1.25 a day in annualized adult equivalent terms is taken as poor. Adult equivalence is based on the modified OECD equivalence scale with household head, other adults and minors respectively assigned weights of 1, 0.5 and 0.3[2]. The calculated poverty line is based on a 2010-2011 average exchange rate of Rs. 85.19381633 per US Dollar is Rupee 38869.67870. A $1 poverty rate of 24.3% is thus obtained.

4.2. Econometric techniques employed

Remittances are an important outcome of the migration process which, being expensive, is not available to all households. A possibility therefore exists that the factors that drive the migration process and the ensuing remittances also determine the household's economic resources. It means that remittance receiving households (called the treatment group) are not randomly selected and may differ from the non-recipient households in such characteristics as risk aversion, skills or individual talent. This selection bias can seriously affect the quality of estimation. In the absence of suitable instruments, matching techniques are considered to be most appropriate for reducing this bias. Empirical analysis in this study is based on one of these techniques called the Propensity Score Matching (PSM). PSM matches treated and control or non-treated groups by comparing the conditional probabilities of participating in the treatment group based on a set of observable characteristics. These probabilities are used to construct a score called the Propensity Score, and are obtained by regressing the treatment variable on the vector of covariates using the Probit or Logit models. As only one state (treatment or non-treatment) can be observed at a given moment (Holland, 1986), therefore only average treatment effect on the treated (ATT) can be calculated as the mean effect of the paired units (Bryson, Dorsett and Purdon, 2002).

Propensity score matching requires that certain conditions be fulfilled. The common support restriction states that for each value of the observable covariates, there is a positive probability of belonging both to the treatment and control groups (Heckman, Ichimura, & Todd, 1997). This condition improves the matching quality by ensuring sufficient overlapping in the propensity scores of the treated and control units (Becker and Ichino, 2002).

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[2] An alternative weightage of 1, 0.8 and 0.5 is also employed. Results are available upon request

The Conditional Independence Assumption implies that given the set of observable characteristics, allocation to the treated group is random, and therefore, selection must be exclusively based on the vector of observable covariates which determine the propensity score (Rosenbaum &Rubin, 1983; Caliendo & Kopeinig, 2008).

A number of matching methods exist for matching the treated and control groups based on propensity scores. These include Nearest Neighbour (NN) matching, Caliper or Radius matching, Stratification matching and kernel matching. In this study, NN, radius and Kernel matching methods are employed to obtain matching estimates. In Nearest Neighbour matching, each treatment unit is matched with its closest neighbor with similar observed characteristics. A unit is selected from the control group as a match for a unit from the treated group on the basis of nearest propensity score. These units are then used to produce an estimate of the counterfactual. The treated unit is matched with its closest neighbour. However, if the neighbour is distant, matching leads to poor estimates. This issue can be resolved by defining a maximum propensity score radius (caliper). In Radius or Caliper matching, each treated unit is matched only with the control unit whose propensity score falls within the pre-defined radius. The matching thus obtained employs the mean of all the compared units. In this study, the caliper is fixed at 0.05.

NN and Radius matching are based on a limited number of control units used to construct the counterfactual. Moreover, it is difficult to a priori know the size of suitable caliper. Kernel matching, in contrast, employs more information available in the sample by using weighted means of all control units to construct the counterfactual. This non-parametric estimator matches all participating units with a weighted average of all control units. All the observations in the treated group which are inside the common support area are employed. The weights used are inversely proportional to the difference between the treated units and the control units, and the highest weight is attached to the closest units. Treated households are matched with a weighted sum of households with similar propensity scores. The Kernel estimator that uses all the data from the untreated group is known as Gaussian Kernel, while the one based on fixed bandwidth parameters is called the Epanechnikov Kernel. The choice of the bandwidth parameter in a Kernel estimation is a compromise between a small variance and an unbiased estimate of the true density function, with low bandwidth providing unbiased estimates and large bandwidth leading to a better fit (Pagan and Ullah, 1999). In this study, the Gaussian Kernel estimator is employed

with a default bandwidth of 0.06 as well as a lower bandwidth of 0.01 to obtain more unbiased estimates. The PSM estimations are carried out using Stata's psmatch2 module (Leuven and Sianesi, 2012).

5. Key findings

Table 5 shows the results of the four matching models for the overall and category-wise asset accumulation. The Average Treatment Effects on the Treated (ATT) for foreign remittances given in Panel I are found to be significant at the 1% level, suggesting a substantial overall increase in the asset stock of the migrant households. Household receiving international transfers hold between 0.22 (NN matching) and 0.36 standard deviation (Kernel matching with 0.06 bandwidth) more assets compared with their non-recipient counterparts. Domestic remittances, in contrast, fail to show any significant effects on the recipient households' asset holdings, with none of the ATTs found significant at or below 10%.

Similar patterns are visible for the four asset categories, where ATT for foreign remittances are found mostly significant whereas those for domestic remittances are invariably insignificant. While the holdings of all the asset categories go up among foreign remittance-receiving households, productive assets show the lowest increase. In contrast, ownership of consumer durables increases substantially. Similarly, savings in cash and gold and housing assets show remarkable increase, rising by 0.59 to 0.68 and 0.37 to 0.4 standard deviation respectively.
 These findings possibly reflect the long-term spending priorities of the recipient households:
Although using remittance money for accumulating physical and human capital in order to generate future income is important, the migrant households deem it necessary to first improve their immediate living standards by acquiring durable goods and better housing, and accumulate financial assets to serve as precautionary savings. Acquisition of housing and financial assets could also result from the migrant's intention to return back home (Galor and Stark 1990, 1991).

These asset accumulation patterns can also be seen with respect to the size of remittances, with higher amounts of foreign remittances leading to greater accumulation of assets of all categories except for productive assets whose holding does not significantly differ with amounts of

remittances received[3]. As before, the impact of domestic remittances is not significant regardless of their magnitude, except for consumer durables and productive assets whose accumulation increases with the amount of domestic transfer.

Table 5. Remittances and asset categories (Propensity Score Matching)

Assets	NN	Kernel	Kernel (b.w 0.01)	Radius
Foreign remittances				
Total Assets	0.220***	0.355***	0.296***	0.338***
	(0.081)	(0.061)	(0.065)	(0.063)
Housing Quality	0.369***	0.402***	0.389***	0.373***
	(0.055)	(0.046)	(0.049)	(0.048)
Consumer Durables	0.398***	0.441***	0.415***	0.399***
	(0.061)	(0.049)	(0.052)	(0.051)
Productive Assets	0.118	0.149**	0.056	0.153**
	(0.077)	(0.062)	(0.065)	(0.062)
Financial Assets	0.681***	0.650***	0.591***	0.655***
	(0.098)	(0.080)	(0.087)	(0.080)
Domestic Remittances				
Total Assets	0.010	-0.008	0.009	0.020
	(0.070)	(0.049)	(0.052)	(0.051)
Housing Quality	0.020	-0.060	-0.042	-0.043
	(0.050)	(0.038)	(0.040)	(0.039)
Consumer Durables	0.019	-0.059	-0.046	-0.047
	(0.052)	(0.040)	(0.042)	(0.041)
Productive Assets	-0.050	0.016	-0.019	0.019
	(0.059)	(0.046)	(0.048)	(0.046)
Financial Assets	-0.170*	-0.057	-0.049	-0.055
	(0.090)	(0.071)	(0.073)	(0.070)

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The substantially different impact of foreign and domestic remittances on the recipient households' asset accumulation presented above may be due to both the nature and magnitude of the two types of remittances, as well as the recipient household's economic conditions. Households with foreign remittances are at an average more prosperous with an annual income of Rs. 356,659 compared with domestic remittance-receiving households which earn almost half as much (annual income being Rs. 179,065). The lower revenues of the domestic remittance recipients do not allow them extra leeway to buy durables or accumulate other assets compared with their non-recipient counterparts. This is however not the case with foreign remittance receiving households, as their income far exceeds those of the non-recipient ones. Moreover, the share of foreign remittances in the household income is higher at 69% compared with 58% for domestic remittances.

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[3] Results available upon request.

Most foreign remittances are sent by Pakistani migrants working in the states of the Persian Gulf on temporary job contracts. This uncertain additional source of income serves as a means for the migrant household to acquire durable assets, better transport facilities and improved housing. Domestic remittances, on the other hand, depict a behaviour similar to other, permanent sources of household income. Internal migration in Pakistan has been strong in the recent decades, particularly from the rural to the urban areas, and the country's share of urban population, at 37%, is among the highest among the countries of South Asia (World Bank, 2012). Unlike international migration to the Persian Gulf, internal migration leads to more long-lasting remittances which are consequently consumed as any other source of income.

The asset accumulation patterns of households with and without remittances also differ with respect to the place of residence. Tables 6 and 7 respectively show the impact of remittances on assets in the urban and rural areas. Rural recipients of international transfers show a much higher rise in assets compared with urban households (the ATT for the two groups of households range from 0.38 to 0.43 for the rural and 0.15 to 0.21 for the urban households respectively). In addition, the stock of productive assets among the rural recipient households increases by a substantial 0.22 standard deviations, whereas no significant increase can be discerned among urban recipients. In the villages, acquisition of productive assets such as land not only provides the households with a future stream of income but also raises the household's social status.

An intriguing finding is that urban recipients of internal remittances seem to possess fewer housing and consumer goods compared to the non-receiving households. This could be due to the households needing to liquidate these assets for consumption smoothing in the face of financial difficulties. It is noteworthy that at the time of the survey, households receiving domestic transfers reported deteriorating household and community economic conditions compared to the preceding year.

Table 6. Remittances and asset categories: Urban households (Propensity Score Matching)

Assets	NN	Kernel	Kernel (b.w 0.01)	Radius
Foreign remittances				
Total Assets	0.179*	0.214**	0.147**	0.213**
	(0.097)	(0.084)	(0.072)	(0.068)
Housing Quality	0.163**	0.247***	0.216***	0.239***
	(0.066)	(0.059)	(0.059)	(0.059)
Consumer Durables	0.276***	0.328***	0.294***	0.309***

	(0.091)	(0.074)	(0.075)	(0.075)
Productive Assets	-0.023	-0.048	-0.052	-0.048
	(0.079)	(0.061)	(0.063)	(0.061)
Financial Assets	0.499***	0.404***	0.502***	0.433***
	(0.160)	(0.145)	(0.128)	(0.134)
Domestic Remittances				
Total Assets	0.012	-0.071	-0.072	-0.073
	(0.088)	(0.060)	(0.061)	(0.062)
Housing Quality	-0.056	-0.116**	-0.132**	-0.125**
	(0.061)	(0.047)	(0.050)	0.048
Consumer Durables	-0.036	-0.138**	-0.129**	-0.136**
	(0.078)	(0.059)	(0.063)	(0.060)
Productive Assets	0.018	-0.032	-0.054	-0.028
	(0.056)	(0.043)	(0.046)	(0.043)
Financial Assets	-0.268*	-0.127	-0.107	-0.129
	(0.154)	(0.115)	(0.120)	(0.115)

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7. Remittances and assets categories rural households (Propensity Score Matching)

Assets	NN	Kernel	Kernel (b.w 0.01)	Radius
Foreign remittances				
Total Assets	0.389***	0.431***	0.382***	0.389***
	(0.093)	(0.071)	(0.078)	(0.076)
Housing Quality	0.556***	0.513***	0.471***	0.481***
	(0.066)	(0.053)	(0.054)	(0.054)
Consumer Durable Assets	0.477***	0.503***	0.423***	0.446***
	0.072	0.056	0.058	0.057
Productive Assets	-0.025	0.220**	0.141	0.224**
	(0.124)	(0.094)	(0.097)	(0.094)
Financial Assets	0.651***	0.719***	0.700***	0.719***
	(0.124)	(.0998)	(0.109)	(0.100)
Domestic Remittances				
Total Assets	-0.097	0.048	0.014	0.029
	(0.083)	(0.059)	(0.064)	(0.060)
Housing Quality	-0.017	0.002	-0.014	-0.011
	(0.056)	(0.045)	(0.047)	(0.045)
Consumer Durable Assets	0.070	0.020	-0.002	0.005
	(0.060)	(0.047)	(0.050)	(0.048)
Productive Assets	0.015	-0.012	-0.066	-0.010
	(0.085)	(0.069)	(0.073)	(0.068)

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Recipient households living below the poverty line also differ from their non-poor recipient counterparts in their asset portfolio. Table 8 shows the relationship between remittances and asset indices for both the poor and non-poor households[4]. While remittances from within the country show no significant association with asset holdings among the non-poor households, sizeable effects could be noticed among the poor. The latter group of households indicate a significant and positive association between remittance receipt and housing assets. Similarly, while non-poor households receiving international transfers do not show any significant appetite for productive

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assets, there does exist a significant relationship between remittances and productive assets among the poor households. The divergent asset accumulation patterns of poor households with international and domestic transfers again points to the nature of these remittances. Poor recipients of foreign remittances use them for improving their capital endowment treating the remittances as transitory income, whereas the poor households receiving domestic transfers consider them a more permanent part of the income and thus spend them for purchasing durable goods and improving housing.

Table 8. Remittances and asset categories: Poor and non-poor households (OLS estimates)

Assets	Poor		Non-poor	
	Foreign Remittances	Domestic Remittances	Foreign Remittances	Domestic Remittances
Total Assets	0.278**	0.302***	0.312***	0.037
	(0.120)	(0.100)	(0.0500)	(0.040)
No. of Obs.	528	528	4,579	4,579
R-Squared	0.455	0.455	0.562	0.562
Housing Quality	0.190	0.250***	0.303***	-0.002
	(0.223)	(0.077)	(0.039)	(0.040)
No. of Obs.	1,483	1,483	7,186	7,186
R-Squared	0.336	0.336	0.499	0.499
Consumer Durables	0.300***	0.096	0.336***	0.016
	(0.092)	(0.068)	(0.045)	(0.038)
No. of Obs.	1,483	1,483	7,186	7,186
R-Squared	0.332	0.332	0.433	0.433
Productive Assets	0.272*	-0.038	0.0421	-0.018
	(0.154)	(0.086)	(0.066)	(0.058)
No. of Obs.	1,472	1,472	7,151	7,151
R-Squared	0.134	0.134	0.327	0.327
Financial Assets	0.793*	-0.087	0.508***	-0.022
	(0.407)	(0.216)	(0.085)	(0.075)
No. of Obs.	530	530	4,595	4,595
R-Squared	0.187	0.187	0.257	0.257

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

6. Estimation quality and robustness checks

6.1. Quality and sensitivity diagnostics

The four matching routines provide similar results for the two types of treatment groups. The full sample as well as rural, urban, poor and non-poor subsamples are individually balanced by calculating corresponding propensity scores and applying the common support. Common support is ensured by implementing the common support region and the receiving households with propensity scores greater than the maximum or lower than the minimum propensity score among the non-recipients are not considered. The balancing and sensitivity tests indicate the quality of the matches of the treatment and control groups. As reported in Table A3, tests for balance of the included covariates show a substantial bias reduction between the recipient and non-recipient

groups across model specifications. For example, the more conservative kernel estimation with 0.01 bandwidth performs well in case of foreign remittances. The percentage reduction in standardized mean bias for all estimations ranges from 70 % to 93 %, which is substantially above Rubin (1985)'s suggested reduction of 20%. Furthermore, the post-matching pseudo R^2 dropped significantly from 25% to less than 1%. The p-values of the likelihood ratio tests show that the joint significance of the covariates is invariably rejected after matching where as it was never rejected prior to matching.

Conditional independence is tested through the Rosenbaum sensitivity test using Stata's Rbounds user command (DiPrete and Gangl 2004). The test gauges the robustness of the selection process to the presence of a hidden bias due to unobservable variables (Rosenbaum, 2002; Becker and Caliendo, 2007). The test uses NN matching results to draw the confidence intervals of the outcome variables for different values of Gamma (G). Values close to 1 indicate the sensitivity of ATT to hidden bias. The test is performed by computing the maximum and minimum p-values using the Wilcoxon sign rank test and the Hodges-Lehman point estimates and their respective confidence intervals. An upper bound of zero or a p-value greater than 0.05 for the two suggests a critical level of G at which the matching estimates are no more statistically significant.

Table 9 reports the Rosenbaum Bounds test statistics for total assets and their subcategories with foreign remittances as the treatment variable. Rosenbaum bounds are calculated only for significant ATT estimates. The lower and upper bounds of the Hodges-Lehmann estimates (Column 4-5) and the maximum p-values for the Wilcoxon signed-rank test (Columns 3) show that the cut-off point at which the matching estimates become insignificant is 1.3 and 1.4 at the minimum respectively. This implies that the odd ratio needs to increase by at least 30% in order to render the estimation biased due to an unobservable variable. This relatively moderate likelihood suggests that the estimations are not strongly sensitive to selection bias. The causal effects of remittances on household asset accumulation can therefore be termed satisfactory.

Table 9. Rosenbaum bounds sensitivity analysis: Foreign remittances

	Γ	Wilcoxon's signed rank test		Hodges-Lehmann point estimates		95% confidence Interval	
		sig+	sig-	t-hat+	t-hat-	CI+	CI-
Total Assets	1.00	<.00001	<.00001	.240419	.240419	.121094	.357617
	1.10	<.00001	<.00001	.194471	.283751	.074764	.400275
	1.20	.007109	<.00001	.153983	.324352	.031099	.442484
	1.30	.033115	<.00001	.115281	.362844	-.008084	.479917
	1.40	.102001	<.00001	.080977	.394879	-.07851	.546403
Housing Quality	1.00	<.00001	<.00001	.378548	.378548	.270987	.483281
	1.20	<.00001	<.00001	.292843	.461637	.183259	.568296
	1.40	<.00001	<.00001	.219162	.531553	.108004	.639138
	1.60	.00303	<.00001	.155215	.592474	.046335	.702475
	1.80	.035509	<.00001	.102527	.645164	-.009502	.75875
	1.90	.084324	<.00001	.054791	.693272	-.058235	.806412
Consumer durables	1.00	<.00001	<.00001	.407031	.407031	.290404	.521224
	1.20	<.00001	<.00001	.313526	.49844	.195318	.614026
	1.40	.000079	<.00001	.239549	.573295	.116772	.69001
	1.60	.003458	<.00001	.168502	.640049	.045844	.759682
	1.80	.039117	<.00001	.10994	.69723	-.012582	.816559
	1.90	.091453	<.00001	.081942	.724794	-.042157	.844615
Productive Assets	1	.048838	.048838	.104362	.104362	-.020244	.25416
	1.1	.198938	.006741	.052532	.163527	-.072861	.323542
Financial Assets	1.00	<.00001	<.00001	.693147	.693147	.509285	.871485
	1.20	<.00001	<.00001	.571674	.81482	.381569	.99025
	1.40	<.00001	<.00001	.468455	.914063	.275023	1.0924
	1.60	<.00001	<.00001	.376386	.997467	.183862	1.18356
	1.80	.001779	<.00001	.293893	1.07422	.101471	1.26286
	2.00	.012777	<.00001	.229766	1.14006	.03204	1.33219

Note: * Gamma - log odds of differential assignment due to unobserved factors   sig+ - upper bound significance level sig- - lower bound significance level t-hat+ - upper bound Hodges-Lehmann point estimate   t-hat- - lower bound Hodges-Lehmann point estimate CI+   - upper bound confidence interval (a= .95) CI-   - lower bound confidence interval (a= .95)

6.2. Robustness measures

This analysis is based on various propensity matching procedures, which mainly rely on balancing the treatment and control groups. However, an overall good balancing does not necessarily imply joint balancing of all the covariates as the underlying propensity score model can be mis-specified (Hainmueller, 2012). One solution can be to integrate covariate balance into the weight function employed to adjust the control units (Hainmueller, 2012). This method, called 'Entropy balancing', can significantly improve the quality of covariate balance and allows better use of information present in the data. The method preprocesses data by adjusting weights to include the selected covariates on the known moments of the covariate distribution, thereby obtaining an exact covariate balance. Consequently, we analyze our dataset using Entropy balancing as a robustness measure. The estimations are carried out using Stata's ebalance

package (Hainmueller and Xu, 2013). Findings given in Table 10 are identical in signs and significance to the previous results obtained from other matching methods.

Table 10. Remittances and household assets (Entropy balancing)

Assets	Full Sample		Urban		Rural	
	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic
Total Assets	0.361***	0.001	0.155***	-0.052	0.484***	0.025
	(0.037)	(0.033)	(0.050)	(0.043)	(0.049)	(0.047)
No. of obs.	5107		2660		2447	
Housing Quality	0.350***	-0.025	0.232***	-0.096**	0.493***	-0.001
	(0.032)	(0.030)	(0.048)	(0.042)	(0.045)	(0.040)
No. of obs.	8669		4287		4382	
Consumer Durables	0.362***	-0.015	0.245***	-0.105**	0.489***	0.029
	(0.036)	(0.031)	(0.245)	(0.050)	(0.048)	(0.039)
No. of obs.	8669		4287		4382	
Productive Assets	0.0931*	0.047	-0.041	-0.001	0.139**	(0.073)
	(0.049)	(0.038)	(0.056)	(0.038)	(0.074)	(0.055)
No. of obs.	8623		4280		4343	
Financial Assets	0.535***	-0.061	0.394***	-0.095	0.613***	-0.036
	(0.066)	(0.062)	(0.087)	(0.095)	(0.090)	(0.081)
No. of obs.	5125		2662		2463	

Note: For entropy balancing, households without remittances are reweighted such that the means, variances and skewness of the control variables resemble those of households with remittances. Standard errors are given in parentheses. Significance level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

For comparison, we also obtain the estimates using Ordinary Least Squares. The results are likewise found robust[5]. In addition, we test the robustness of our findings by replacing the treatment variables (amount of remittances instead of their incidence) and covariates (for example, aggregate household income in place of per capita household income). The results are again similar, and maintain the essence of the analysis.

7. Conclusion

This study examined wealth gains among Pakistani households resulting from international and internal transfers. The changes in asset stocks among households receiving foreign remittances were found to be substantially different from those among the recipients of domestic remittances. Not only did the foreign remittance-receiving households accumulate more assets than their non-recipient counterparts, their acquired stock grows for all categories of assets. Migrant households accumulate productive assets such as land and livestock as well as the household's human capital. However, this increase pales in comparison with accumulation of consumer durables, housing, and financial assets. These trends are reinforced as the amounts of remittances increase. In contrast, the stock accumulation of domestic remittance-receiving households does not appear

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[5] Estimations available upon request.

any different from the non-recipient households. Recipients of foreign and domestic remittances show similarly divergent patterns in rural and urban parts of the country. Rural recipients of international transfers acquire much more assets, including productive assets, compared with the non-recipient rural households. Similarly, poor foreign remittance receivers appear to be more keen at accumulating productive assets than the non-poor receivers, while impoverished recipients of internal transfers show more interest in acquiring consumer durables and upgrading their houses.

These findings lead to a number of implications:

First, migrant households treat foreign remittances as a mainly transitory income and therefore spend it to raise their assets and capital stock. Domestic remittances, on the other hand, are considered a permanent source of income and thereby serve more or less the same purposes as the households' other regular revenues. This corroborates the findings of previous studies such as Adams (1998) which showed support for the Permanent Income Hypothesis.

A second related conclusion is that remittances serve to save for rainy days. Migrant households use foreign remittances to generate precautionary savings in cash and kind (particularly in gold). Gold jewelry has traditionally served as the savings of choice for women in South Asia, and also constitutes a major item of the dowry widely practiced in the region.

A third noteworthy implication is that even though foreign remittances raise recipient households stock of all kinds of assets, the increase in productive assets seems to be weak. This could be implied to support the argument that remittances are mostly consumed rather than invested. This notwithstanding, households receiving international transfers, even among the poorest strata of the society, acquire some productive assets and can therefore expect to generate future income from the investment. Moreover, not all consumer durables can entirely be counted as consumption. Sewing machines and computers can be used as capital inputs in small home-based businesses, while automobiles can transport the produce of home farms.

To sum up, remittances, especially those from abroad, raise the recipient households' short- and long-term living standards by improving the asset stock, increasing the households' physical and human capital, and generating savings.

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Appendix

Table A1. Household assets PCA: Eigen values

Assets	Coefficient	Assets	Coefficient
1-Housing Quality		**2-Consumer Assets**	
Ownership		Iron	0.300
Self owned	0.187	Electric Fan	0.201
Hired	-0.034	Sewing machine	0.248
No. of Rooms		Radio	0.086
-One	-0.209	Chair	0.280
-Two	-0.027	Watch	0.238
-Three	0.103	TV	0.296
-Four	0.199	VCP	0.163
-Five or more	0.321	Refrigerator	0.324
Roof Material		Air Cooler	0.178
-Other	-0.279	Air Conditioner	0.209
-Wood/Bamboo	-0.018	Computer	0.225
-Steel/Cement sheets	0.121	Bicycle	0.019
-RCC/RBC	0.278	Motorbike	0.187
Wall Material		Car	0.188
-Other Stone Wood	-0.732	Mobile	0.234
-Mud Bricks/Blocks	-0.327	Cooking Range	0.155
-Burnt bricks/Blocks	0.215	Burner	0.261
Source of drinking water		Washing Machine	0.323
-Other (tanker , mineral , other)	-0.719	**Eigen value**	**5.348**
-River/stream	-0.488	**Proportion**	**0.282**
-Outdoor tap	-0.371		
-Well (open/closed)	-0.291	**3-Productive Assets**	
-Hand pump	-0.137	Tractor	
-Motor pump	0.085	-No	-0.145
-Piped water	0.422	-Yes	0.828
Toilet type		Commercial Building	
No Toilet	-0.648	-No	-0.059
-Other	-0.411	-Yes	0.281
-Pit latrine	-0.304	Non-Agricultural Land	
-Dry raised latrine	-0.192	-No	-0.088
-Flush connected to open drain	-0.059	-Yes	0.481
-flush connected to tank	0.190	Agricultural Land	
-Flush connected to sewerage	0.591	-No	-0.300
Cooking fuel		-Yes	0.598
-Other	-0.588	Livestock	
-Dung cake	-0.381	-No	-0.280
-Wood	-0.096	-Yes	0.556
-Gas	0.332	-Number of Schooling	0.124
Lighting Source		-Average Education	0.068
-Other (Gas, Wood , Candle , other)	-0.836	**Eigen value**	**2.373**
-Kerosene oil / diesel / petrol	-0.564	**Proportion**	**0.339**
-Electricity	0.067		
Telephone		Supply Drinking Water	
-None	-0.456	-Far (15-60)	-0.639
-Mobile	0.092	-Near (0-14)	0.048
-Landline and mobile	0.684	**Eigen value**	**3.820**
		Proportion	**0.382**

Table A2. Summary statistics

Variable	Variable Description	Mean
Foreign Remittances	Dummy variable, takes the value of 1 if any member of the household received remittances from abroad during last 1 year, 0 otherwise	.054
Domestic Remittances	Dummy variable, takes the value of 1 if any member of the household received remittances inside Pakistan during last 1 year, 0 otherwise	0.107
Income per capita (in log)	Income per capita includes remittances income	10.07
Household size	Total number of family members in the household	6.38
Dependency Ratio	Share of members ages under 18 and above 65 in the household	0.50
Age of head	Age of the households head in completed years	46.3
Sex of head	Dummy variable, takes the value of 1 if the household head is a female, 0 otherwise	0.09
Marital status of head	Dummy variable, takes the value of 1 if the household head is married, 0 otherwise	0.92
Work status of head	Dummy variable, takes the value of 1 if the household head is employed, 0 otherwise	0.81
Education of head	Number of years of schooling received by the household head	8.86
Household economic condition	Current situation of household as compare to previous year	-0.21
Local economic condition	Current condition of the area as compare to previous year	-0.32
Region,	Dummy variable, takes the value of 1 if the household resides in rural area, 0 otherwise	0.34
Province	Takes the value of 1 if remittance recipient household lives in Sindh, KPK, Baluchistan otherwise 0	0.41

Table A-3 Quality of Matching Indicators:

	Total assets	Consumer durable/Housing quality	Productive assets	Financial assets	Total assets	Consumer durable/Housing quality	Productive assets	Financial assets
Test indicator	**Foreign Remittances**				**Domestic Remittances**			
Before Matching								
Mean absolute bias	41.14	39.48	39.63	40.84	31.76	32.80	32.96	31.54
Pseudo R²	0.255	0.242	0.242	0.254	0.150	0.158	0.159	0.149
LR χ² (P-value)	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000
After matching								
-Nearest neighbor matching								
Mean absolute bias	5.95	3.97	4.46	4.56	9.25	4.85	6.33	6.79
Pseudo R²	0.015	0.004	0.006	0.007	0.016	0.004	0.008	0.007
LR χ² (P-value)	0.301	0.983	0.887	0.936	0.242	0.828	0.347	0.885
-Kernel based matching								
Mean absolute bias	6.82	7.27	7.38	6.75	5.71	5.86	5.85	5.73
Pseudo R²	0.011	0.010	0.010	0.011	0.004	0.005	0.005	0.004
LR χ² (P-value)	0.643	0.442	0.412	0.650	0.980	0.768	0.775	0.979
-Kernel based matching (b.w 0.01)								
Mean absolute bias	3.42	2.96	2.71	4.07	5.87	5.24	6.20	6.36
Pseudo R²	0.006	0.005	0.004	0.006	0.005	0.004	0.006	0.006
LR χ² (P-value)	0.930	0.946	0.978	0.943	0.959	0.862	0.598	0.937
-Radius matching								
Mean absolute bias	4.22	4.04	7.73	7.17	4.84	5.07	6.12	6.04
Pseudo R²	0.005	0.005	0.011	0.011	0.003	0.004	0.005	0.005
LR χ² (P-value)	0.963	0.908	0.331	0.577	0.995	0.888	0.673	0.957