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Evidence from Pakistan**

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# **How do consumption patterns of foreign and domestic remittance recipients and non-recipients compare? Evidence from Pakistan**

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## **Abstract**

This study analyzes the differential consumption patterns of foreign and domestic remittances to migrant households in Pakistan using Working-Leser framework and propensity score matching. Findings point to differing consumption behaviour across foreign and domestic recipients. Foreign remittances are considered as fungible and spent in the same way as other sources of income. In contrast, domestic remittances are considered a less permanent source of income and are spent more on improving the households' human capital.

**Keywords:** Expenditure, consumption patterns, foreign remittances, domestic remittances, Pakistan.

**JEL Codes:** O12, O15, O53

## **1. Introduction**

Migration, whether from villages to cities or from one country to another, involves a change in consumption patterns of the migrants' households back home. This takes place in several ways:

First, the money migrants remit leads to higher household income which can be differentially consumed, saved or invested. Secondly, remittances help diversify the migrant household's sources of income depending on the extent the household and migrant incomes are correlated. Thirdly, migration exposes the households to new lifestyles and consumption behaviours. These social transfers generate different patterns of food, health, education, living and recreation expenditures.

The impact of migrants' remittances on the households' expenditure behaviour crucially depends on how remittances are perceived by the households. If, given the nature of migration and the migrant's economic status, remittances are considered part of the household's permanent income; they will be treated just as other fungible sources of income and will therefore be consumed in similar fashion. However, if remittances are perceived as a temporary income arrangement, they are more likely to be saved or invested than consumed.

These marginal consumption patterns of remittances shape the growth and developmental effects of remittances on the migrants' home economy.

If the remittances lead to higher marginal shares of food, consumer goods and other non-investment expenditures, they are thought to have minimal impact on the economic development of the community. Studies such as Adams and Cuecuecha (2010), Chami, Fullenkamp and Jahjah (2003:10-11) and Clément (2011) support this pessimistic view of remittances.

On the other hand, Acosta et al. (2008), Adams (1998; 2005), Alderman (1996), Amuedo-Dorantes and Pozo (2011), Kifle (2007) and Taylor and Mora (2006) among others suggest beneficial effects of migrant remittances through improvements in the households' healthcare, educational attainment and higher investment in productive ventures.

According to Massey et al. (1987) and Russell et al. (1990), these beneficial investments occur once the migrant household's subsistence needs are satisfied.

The above mentioned differences in findings pertain to the country or area examined the nature of remittances under study, and the kind of data and estimation techniques employed.

This lack of generalizability implies that findings from one developing country cannot adequately explain the impact of migrant remittances in other developing countries. In this study, we probe the consumption patterns resulting from the migrant remittances to one of the world's top ten remittance receiving countries, namely Pakistan.

Using a large representative household survey dataset carried out in Pakistan in 2010-2011, we study remittances' impact on various expenditure categories of the migrant households' annual budgets as well as their respective shares in the household budget.

We focus both on international as well as internal remittances as the two income streams arise from different socioeconomic dynamics. We carry out our estimations using the Working Leser framework and matching algorithms and obtain robust results.

We find that after controlling for a large array of household and community characteristics, foreign remittance receiving households, at an average, do not substantially differ in their consumption habits from similar non-recipient households. Although spending among recipient households is higher in the aggregate as well as the food, durable items, consumer and miscellaneous items categories, spending on health, education, housing and recreation does not differ from that prevalent among non-recipient households. Moreover, budget shares of six out of eight spending categories among foreign remittance receiving households are insignificantly different from non-receiving households. However, spending on health and housing among recipient households is lower (2.8 % compared to 3.2 %) and (26.3% compared to 27.3%) respectively. These findings indicate that foreign remittance receiving households, being at an average more prosperous, have stable spending patterns which do not significantly change as a result of additional income. In contrast, the amounts and shares of various items in the budget of domestic remittance recipients undergo important modifications. The amount and share of healthcare spending in the household budget is higher among the recipient households whereas that for both food and recreation is lower.

The consumption behaviour of Pakistani migrant households differs with respect to their economic status. Poor households (those earning less than \$1) have spending patterns substantially different from those of the rest of the population. Those receiving remittances from abroad have smaller budget for education and housing, while those receiving domestic remittances have bigger budget for housing expenses. Recipients of domestic remittances living below one and two dollar a day also spend less on recreation and miscellaneous categories.

The remainder of the study is organized as follows: In the next section, we overview extant literature on the consumption behaviour of remittance recipient households in the developing countries. Bivariate association of foreign and internal remittances with migrant households' economic, demographic and geographical features is presented in Section 3, followed by the description of empirical model and econometric techniques in Section 4.

Section 5 presents key findings using Ordinary Least Squares, Tobit and Propensity Score Matching, followed by their discussion in Section 6. The penultimate section illustrates various robustness measures undertaken in the analysis. Section 8 concludes.

## **2. Literature Overview**

A large body of research exists on the various uses to which migrant remittances are put across the developing world, and to what extent do those patterns differ from other sources of household income. Remittances are often found to be spent mainly on consumption goods rather than saved or invested (Chami, Fullenkamp and Jahjah, 2003; Clément, 2011; Durand and Massey, 1992).

Remittances are reported to be frittered away on conspicuous consumption such as consumer items symbolizing social status and social ceremonies at the cost of more productive expenditures (Chandavarkar, 1980:39; Tabuga, 2007).

Findings from other studies challenge this pessimistic view. Even though the migrant household may increase its consumption spending as a result of receiving money from the migrant member of the household, the additional funds may improve the household's living conditions. Expenditure on more and better quality food leads to better nutrition and food security (Durand et al., 1996; Jimenez, 2009).

Moreover, part of the additional income is spent on productive consumption goods such as education and health. Adams (2005) in case of Guatemala, Cardona Sosa and Medina (2006) in case of Columbia and Kifle (2007) in case of Eritrea find evidence of an increased share of education spending in the household budget resulting from migrant remittances. Similarly, studies such as Amuedo-Dorantes and Pozo (2011), Cardona Sosa and Medina (2006) and Yang (2005) report proportionally higher marginal health spending by migrant households. Acosta et al. (2007) examine the household consumption patterns of seven Latin-American countries and find a general decrease in the share of food and other consumption spending and a significant increase in the share of health spending among migrant households.

Some studies indicate that remittances lead to higher budget allocations on construction and reparation of houses (Adams, 1991; 1996, Arif, 2009; Osili, 2004).

In certain economies, a greater proportion of remittances is invested in expanding small scale businesses, purchase of necessary capital goods and machinery and financing new ventures (see for example Taylor and Mora, 2006).

A growing body of literature compares the consumption patterns of international and domestic remittances. Given different economic and demographic profiles of migrants and migrant households, the two kinds of remittances widely differ in their usage. Clément (2011) for instance finds that recipients of international remittances in Tajikistan have a higher propensity to consume than to invest, while the consumption patterns of domestic Tajik remittance recipients do not differ significantly from the non-recipient households. The findings indicate that higher proportion of household expenditure is devoted to healthcare among domestic migrant households, whereas no increase in budgetary allocation for health, education or other productive expenditures can be traced among the recipients of foreign transfers.

In contrast, Castaldo and Reilly (2007) find that the consumption pattern for Albanian households receiving internal remittances is not statistically different from those that do not receive such transfers, whereas households who receive remittances from abroad spend, on average, a lower share of their expenditure on food and a higher share on consumer durables compared to households who do not receive any type of migrant remittances. In the same vein, Cuong (2009) concludes that internal remittances in Vietnam are spent more on consumption items as compared to international remittances.

The differential use of remittances discussed so far depends not only on the migrant's income and the consequent choice of the amount and frequency of remittance back home, but also on the socioeconomic profile of the migrant household. Remittances can add to the savings or invested gainfully once the household's basic consumption needs have been fulfilled (Russell et al., 1990). Remittances therefore represent a short-term coping strategy that allows the dependent households to achieve a basic level of consumption. A migrant household's consumption behaviour is also driven by its perception of remittances as transitory or permanent income. In the former case, remittances are more likely to be spent on physical or human capital investments than consumed (Adams, 1998). If remittances are treated as any other source of income (permanent income hypothesis), they may be spent just like other

source of household income. Migrant households' propensity to consume may then not differ in any substantial manner from the non-migrant households (Athukorala, 1990; Cardona Sosa and Medina, 2006).

A few studies have examined consumption patterns of Pakistani households receiving foreign remittances. Ahmed et al. (2010), for instance, find that foreign remittance recipients have higher budget shares devoted to food, consumer items and education. Arif (2005) analyze the 2000-2001 Pakistan Socioeconomic Survey (PSES) and concludes that total per capita monthly expenditures of migrant households are at least 50% higher than the expenditures of their non-migrant counterparts. Migrant households, at an average, spend 38% of the total expenditure on food while non-migrant households spend an average of 46% on food items.

### **3. Data description**

This study is based on the 2010 - 2011 round of Pakistan Social and Living-Standards Measurement Survey (PSLM) carried out on 16341 households. The PSLM is a representative country-wide survey that collects data on household income, consumption, wealth, savings, work, social and demographic features. A two-step random stratified sampling scheme is adopted for the purpose with the sample stratified on province and rural/urban basis. Villages and enumeration blocks are taken as primary sample units in rural and urban areas respectively, while households in each of the 1180 sampled villages and enumeration blocks are considered as the secondary sampling unit.

The dataset contains data on various sources of household income. A sizeable proportion of households (5.5%) receive foreign remittances. The corresponding share for domestic remittances is even higher at 10.7%. Tables 1 and 2 present demographic, consumption, economic and locational features of foreign and domestic remittance receiving households respectively. Households receiving international remittances appear to be significantly different from those who do not receive remittances. Recipient households are substantially larger than non-recipient households. Similarly, recipients are at an average more educated and more often located in rural areas as compare to non-recipient households. A smaller proportion of adults from recipient households work (43%) as compared to non-recipient ones (83%). Heads of foreign remittance receiving households are older and somewhat less educated. 43% of recipient households' heads are women as compared to 7% non-recipient ones, suggesting that many of the foreign migrants are male household heads in whose absence, women take up more household responsibilities. International migration from

Pakistan is overwhelmingly male with few women going abroad for employment. Houses of international remittance receiving households are better located, with shorter distances to public services and necessities such as drinking water, public transport, groceries and primary, middle and high schools. This suggests their relatively better economic status.

**Table 1.** Household Profile by Access to International Remittances

Variable	Households with no foreign remittances	Households with foreign remittances	Difference	Two sample t-test
<b>Demographic indicators</b>				
Age	46.25792	48.81812	2.560	4.010
Household size	6.358343	6.82346	-0.4651171	-2.820
Dependency	.4935284	.5356499	.0421214	0.000
Number of schooling <sup>18</sup>	1.835437	2.251813	.4163768	0.000
Sex head	0.0740946	0.4299649	0.3558703	16.110
Marital Status	0.8960914	0.8896244	-0.006467	-0.500
Work of head	0.830998	0.4261364	-0.4048616	-17.210
<b>Consumption indicators</b>				
Total expenditure	197898.1	296255.8	98357.71	6.950
Food	75227.02	103198.2	27971.17	9.050
Education	7253.349	15604.62	8351.27	6.230
Health	6272.664	8656.577	2383.913	4.500
Housing and Utilities	53664	72332.95	18668.94	5.070
Consumer non-durables	20231.83	29039.46	8807.628	6.700
Recreation	966.8521	1102.112	135.2603	0.760
Others	29364.22	51038.04	21673.82	4.360
Durables	4918.161	15283.87	10365.71	2.170
<b>Economic indicators</b>				
Income	175672.8	342627.8	166955	3.16
Cultivated Land	0.2349275	0.259245	0.024	1.100
<b>Location Indicators</b>				
Urban	.3484787	.2536354	-.0948433	0.000
Rural	.6515213	.7463646	.0948433	0.000
Punjab	.5907822	.6341893	.0434071	0.143
Sindh	.2486419	.0177649	-.230877	0.000
KPK	.1123731	.3321718	.2197988	0.000
Baluchistan	.0482029	.015874	-.0323289	0.000

Source: Authors' calculations using PSLM (HIES) 2010-110



**Table 2.** Household Profile by Access to Internal Remittances

Variable	Households with no domestic remittances	Households with domestic remittances	Difference	Two sample t-test
<b>Demographic indicators</b>				
Age	46.02843	49.4646	3.43617	6.85
Household size	6.454115	5.8002	0.65392	6.0300
Dependency	.4899497	.54467	.0547204	0.000
Number of schooling18	1.886867	1.61973	-.2671369	0.000
Sex head	0.0572262	0.3951	0.33787	20.27
Marital Status	0.9060815	0.8099	-0.09619	-7.92
Work of head	.8486824	.4782539	-.3704286	-19.86
<b>Consumption indicators</b>				
Total expenditure	205423.2	185418	-20040.4	-2.0005
Food	77558.46	70096.3	-7462.12	-3.76
Education	7673.717	8006.37	332.648	0.4
Health	6212.235	7985.15	1772.92	2.84
Housing	55597.31	47094.5	-8502.82	-4.3300
Recreation	1025.68	546.646	-479.034	-5.34
Consumer non-durables	20885.22	19288.1	-1597.18	-2.26
Others	31082.34	26116.3	-4966.03	-3.51
Durables	5388.174	6283.89	895.715	0.65
<b>Economic indicators</b>				
Income	223309.5	172900.9	-50408.65	-3.29
Cultivated land	0.2366555	0.23312	-0.00353	-0.2
<b>Location Indicators</b>				
Urban	.3616949	.1903292	-.1713657	0.000
Rural	.6383051	.8096708	.1713657	0.000
Punjab	.5739299	.7525036	.1785737	0.000
Sindh	.2596421	.0399568	-.2196853	0.000
KPK	.1146812	.2049193	.0902381	0.000
Baluchistan	.0517468	.0026204	-.0491264	0.000

Source: Authors' calculations using PSLM (HIES) 2010-110

Households receiving domestic transfers likewise show some important differences with non-recipient households (Table 2). Like foreign remittance receiving households, recipients of internal remittances are predominantly based in villages and have older and less educated heads. However, unlike foreign remittance receiving households, domestic remittance receiving households are smaller and have lower number of children and working age adults than the non-receiving ones. Socioeconomic and geographical characteristics of internal remittance receiving and non-receiving households often show no statistically significant difference. Household expenditure for foreign remittance receiving households is substantially higher than the non-receiving households (Rs. 296,251 compared with

Rs.197,924). Expenditure on all budget categories is higher among foreign remittance receivers. For instance, expenditure on food is about 50% higher while expenditure on education and purchase of durable items is approximately 100% and 300% higher. Tables 3 and 4 show the budget shares of various expenditure categories for households receiving foreign and domestic remittances respectively. The budget share of education and durables is substantially higher among foreign remittance receivers; while that of food is significantly lower (39% as compared to 41%) (Table 3).

**Table 3.** Household Budget Shares by Access to International Remittances

Items	Households with foreign remittances	Households without foreign remittances	Difference	Two sample t-test	Two-sample t-test (prob.)
Food	39.04	41.02	-1.9826	-3.2400	0.0010
Education	4.470415	2.57824	1.8922	7.3200	0.0000
Health	3.393419	3.393226	0.0002	0.0000	0.9990
Housing and Utilities	24.78104	26.37391	-1.5929	-2.9600	0.0030
Recreation	.3154598	.4159726	-.1005129	-3.6300	0.0000
Consumer non-durables	10.77991	10.9625	-0.1826	-0.9600	0.3360
Miscellaneous	14.30904	13.65572	0.6533	1.5700	0.1160
Durables	2.906913	1.594117	1.3128	4.4300	0.0000

Source: Authors' calculations using PSLM (HIES) 2010-110

**Table 4.** Household Budget Shares by Access to Domestic Remittances

Items	Households with domestic remittances	Households without domestic remittances	Difference	Two sample t-test	Two-sample t-test (prob.)
Food	40.29083	40.9949	-0.70406	-1.2900	0.1990
Education	3.304468	2.606556	0.697912	3.9300	0.0000
Health	4.472435	3.264184	1.2083	6.2100	0.0000
Housing and Utilities	26.09191	26.31014	-0.21823	-0.5400	0.5920
Recreation	0.2202343	0.4333721	-0.21314	-9.7800	0.0000
Consumer non-durables	11.15306	10.92857	0.22449	1.5000	0.1350
Miscellaneous	12.39204	13.84787	-1.4558	-1.455832	0.0000
Durables	2.077123	1.616264	0.460858	2.4700	0.0140

Source: Authors' calculations using PSLM (HIES) 2010-110

In contrast, total annual expenditure of internal remittance receiving households is slightly lower than non-recipient households (Table 2), showing that domestic remittances are usually sent to households belonging to lower income groups. This is also apparent in lower food, housing and recreation expenditures and higher health spending among receivers of domestic remittances. Compared to households receiving transfers from abroad, domestic remittance

receivers allocate higher shares of their household budget to food, health and housing and lower share to education expenditures (Table 4).

From the bivariate statistics shown above, an initial comparison between the households receiving the two types of transfers can be made: households receiving foreign transfers are larger and relatively more prosperous than either non foreign remittance receiving or domestic remittance receiving households. They spent more on education and durable item and spent less on food and health despite spending more than other households. These descriptive statistics need to be interpreted with caution as they need to be controlled for various socioeconomic and demographic factors that distinguish the two types of households.

#### **4. Empirical methodology**

The empirical strategy is based on the hypothesis of utility maximization. A household's resource distribution on various categories of expenditure are therefore assumed to reflect the household's consumption preferences. Model estimation proceeds in two steps. First, least squares are fitted to estimate the impact of remittances on household expenditures and their corresponding budget shares by employing the Working Leser specification and controlling for various economic, demographic and locational factors. In the second step, a set of propensity score matching (PSM) techniques is used to control for potential selection bias present in the model by matching various observable characteristics of the recipient and non-recipient households. First, Probit model is used to calculate propensity scores. Common support is then defined and average treatment effects on the treated (ATT) are obtained using the Nearest Neighbour (NN), Radius matching and Kernel matching methods. Given that PSM is the mainstay of this study, the set of technique is briefly described in subsection 4.2.

##### **4.1. Model Specification**

Extant empirical literature has usually used the Engel curve framework to study the consumer behaviour. This approach has recently been applied to study the role of remittances in shaping household consumption patterns (see for instance Adams, 2005; Castaldo and Reilly, 2007; Taylor and Mora, 2006). In this framework, the quantity of a good or service consumed is taken as a function of the consumer's total expenditure (Deaton & Muellbauer 1999, p. 19) . The estimation of this framework therefore requires a functional form such as the Working-Leser specification (Working, 1943; Leser, 1963). The Working- Leser model relates budget share linearly to the logarithm of total expenditure (Deaton & Muellbauer 1999, p. 19).

A change in the share of a consumption category in response to a factor such receipt of remittances can therefore tell us about the relative importance of that item in the consumption basket.

The semi log functional form of the specification employed in this study includes various economic, socio demographic and geographical variables in addition to the household's total expenditure, and can be given as:

$$\omega_{ij} = C_i/E_j = \beta_i + \gamma_i(\log E_j) + \sum_j \mu_{ij} Z_j + \varepsilon_{ij} \quad (1)$$

The marginal and average budget shares for the  $i$ -th category can be derived from equation (1) as follows

$$dC_i/dE_j = \beta_i + \gamma_i(1 + \log E_j) + \sum_j \mu_{ij} Z_j + \varepsilon_{ij}$$

$$ABS_i = C_i/E_j$$

Our baseline model can therefore be given as:

$$\omega_{ij} = \beta_i + \gamma_i(\log E_j) + \delta_i R_j + \sum_j \mu_{ij} Z_j + \varepsilon_{ij} \quad (2)$$

Where  $\omega_{ij}$  represents expenditure bracket  $i$  for household  $j$ ,  $E$  is the total expenditure of household  $j$ ,  $R_j$  indicates whether or not the household receives international or domestic remittances,  $Z_j$  represents the set of household characteristics that can affect expenditure behaviour and  $\varepsilon_{ij}$  is an error term. The variables included in the equation (2) are described in subsection 4.3.

## 4.2. Description of econometric techniques

### 4.2.1. Least Squares and Tobit

The modified Working Leser specification described above is estimated by using Ordinary Least Squares, and marginal effects of foreign and internal remittances on various expenditure categories are subsequently obtained. However, these estimates are not considered reliable if there are large numbers of zero values in the dependent variable. This can happen if spending on certain items is infrequent. Some households may not purchase any durable items during a

given year. Likewise, spending on some items may not be required. For example, households with no school-going children do not need to spend on education. For such censored datasets, Tobit is considered to be the appropriate estimation technique. This technique assumes the presence of a latent variable which is linearly associated with the set of independent variables. In this study, spending on education, recreation and durables categories show non-negligible number of zero values. The three categories contain 34%, 57% and 33% zero values respectively, and are therefore examined using Tobit specifications. Other expenditure categories contain less than one percent zero values, and are analyzed using OLS. .

#### *4.2.2. Propensity Score Matching (PSM)*

In the situation where the treatment group (e.g. remittance receiving households) are randomly distributed in the sample, the impact of treatment can be estimated by comparing the outcome of recipients with that of the non-recipients. However, households receiving remittances often differ from non-receiving households in such important aspects as financial wherewithal, education, skills and demographic characteristics. Regression-based estimation of remittances' impacts on expenditures may therefore be prone to selection bias in such non experimental situations. The observed outcome (called factual or post treatment outcome) needs to be compared with the outcome that would occur had the households not received remittances (counterfactual outcome).

One way of achieving this is by applying a matching algorithm. Matching methods assume the selection into treatment group to be based on the households' observable characteristics, implying that households in the treatment and non-treatment groups can be matched with respect to those characteristics. However, matching requires identification of comparable groups of households with similar characteristics. This can be done using Propensity Score Matching (PSM) by constructing a summary variable for observable household characteristics, called the "propensity score" (Rosembaum and Rubin, 1983; 1985).

$$P(X) = \text{prob} (R = 1|X)$$

PSM is essentially a weighting scheme that matches treated and non-treated households by comparing the conditional probabilities of receiving remittance based on a set of covariates of the observable characteristics. The probabilities are obtained by using either the Probit or Logit models. As for both types of households, only one state (receipt or non-receipt) 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 households (Bryson, Dorsett

and Purdon, 2002). Furthermore, the stable-unit-treatment-value assumption (SUTVA) has to be satisfied for all households of the sub population prior to ATT estimation (Rubin, 1991).

The ATT for remittance receipt can be given as:

$$ATT = E(C_{i1} - C_{i0} | R_i = 1) \quad (3)$$

Where  $R_i = 1$  refers to recipient households

Re-writing the equation:

$$ATT = E(C_{i1} | R_i = 1) - E(C_{i0} | R_i = 1) \quad (4)$$

The ATT compares the consumption of remittance receiving and non-receiving households conditional on receiving remittances.

Matching methods like PSM require three important assumptions to be fulfilled for the treated and untreated households to be considered similar in term of any unobserved heterogeneity that could affect the probability of treatment assignments and the outcomes of interest. These include conditional independence, common support and balancing. These assumptions are verified using Stata's `pstest` command and `rbounds` user module.

The Conditional Independence Assumption (CIA) is satisfied if the potential outcomes are same for households with identical pre-treatment observed characteristics, irrespective of their treatment assignments.

$$C^1, C^0 \perp R | X$$

This implies that given those characteristics, the allocation to treatment is random. Selection must therefore be exclusively based on the vector of observables which determine the propensity score (Rosenbaum & Rubin, 1983; Caliendo & Kopeinig, 2008).

The common support assumption implies that for each value of observable covariates, there is a positive probability of belonging both to the beneficiary and non-beneficiary groups (Heckman, Ichimura, & Todd, 1997).

$$0 < P(X) < 1$$

This assumption ensures that there is sufficient overlapping in the propensity scores of recipient and non-recipient households to allow sufficient matching. Therefore, only common support observations are used and unmatched observations are discarded.

The balancing assumption states that once households are matched, the characteristics of the constructed recipient and non-recipient households need to be statistically comparable.

$$R \perp X|P(X)$$

In other words, given the propensity score, the observable characteristics of the recipient and non-recipient households are balanced, and the potential outcomes are independent of treatment conditional on the observed covariates.

There are several matching algorithms that can be used for matching the propensity scores. These include Nearest Neighbour (NN) matching, Caliper or Radius matching, Stratification or Interval matching and Kernel matching.

In Nearest Neighbour (NN) matching, each treatment unit is matched with its closest neighbor with similar observed characteristics. A household from untreated group is selected as a matched treated household on the basis of nearest propensity score. These units are then used to produce an estimate of the counterfactual. In NN matching, 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 in the predefined radius. The matching thus obtained uses the average 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. In addition, it is difficult to know a priori the size of suitable caliper.

Kernel matching, in contrast, employs more information available in the sample by using weighted averages of all control units to construct the counterfactual. This non parametric estimator matches all participating units with weighted average of all control units. All the observations in the treated group which are inside the common support area are used. 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 one based on fixed bandwidth parameters is called Epanechnikov Kernel. In this study, Gaussian Kernel estimator is employed with a default bandwidth of 0.06. Estimations are carried out using Stata's psmatch2 module (Leuven and Sianesi, 2003).

### 4.3. Description of selected variables

In the following, we describe various economic, demographic and locational variables that are employed in the multivariate estimations to examine household consumption patterns. Table 5 gives the definition and means of these variables selected.

#### 4.3.1. Consumption variables:

PSLM 2010-2011 contains detailed data on the sampled households' expenditure. These data are aggregated in this study into eight consumption categories namely expenditure on food, education, health, housing, recreation, consumer items, durables and miscellaneous expenditures.

Consumer items include goods for personal consumption which have a life expectancy of less than one year, such as clothing, footwear, medicine etc. Durable items are consumption goods with a life expectancy of one year or more, such as furniture, fixtures, television, radio, clocks, kitchen utensils etc. The miscellaneous category contains goods and services not included in any of the other expenditure brackets.

Different expenditure outlays have different periodicities (weekly, monthly, yearly). These outlays are annualized to create comparable consumption categories. Table 6 describes the eight aggregate consumption categories. These categories are used to calculate shares in annual budget for each household. Household consumption includes the value of goods and services received in kind or own produced and consumed by the household. Total household consumption and expenditures on all categories are alternately taken as dependent variables. All consumption variables are taken in their logs. The values of expenditures are increased by one to allow logarithmic transformation.

**Table 5.** Variable description

Variables	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	.0546572
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	.1074658
Asset index	Index composed of various households assets	5.628314
Cultivated land	Dummy variable, takes the value of 1 if anyone in the household cultivated land during last 12 months, 0 otherwise	.2022447
Household size	Total number of family members in the household	6.325757



Dependency Ratio	Share of members ages under 18 and above 65 in the household	.4793055
Number of schooling <sup>18</sup>	Number of adult members ever gone to school	2.61612
Age of head	Age of the households head in completed years	44.50152
Sex of head	Dummy variable, takes the value of 1 if the household head is a female, 0 otherwise	.0567792
Marital status of head	Dummy variable, takes the value of 1 if the household head is married, 0 otherwise	.9222122
Work of head	Dummy variable, takes the value of 1 if the household head is employed, 0 otherwise	.8415389
Education of head	Number of years of schooling received by the household head	2.302951
Region,	Dummy variable, takes the value of 1 if the household resides in rural area,	.5648286
	0 otherwise	.4351714
Province	Takes the value of 1 if remittance recipient household lives in Punjab	.5998865
	2 if remittance recipient household lives in Sindh	.263429
	3 if remittance recipient household lives in KPK	.1036157
	4 if remittance recipient household lives in Baluchistan	.0330689
Distance index	Index of variables for household's distances from public amenities and basic necessities.	1.488594

**Table 6.** Description of expenditure categories

Expenditure category	Description
<b>Food</b>	Milk and Milk Product, Meat Poultry and Fish, Fresh Fruits, Dry Fruits and Nuts, Vegetables, Condiments and Spices, Sugar and Honey, Non-Alcoholic Beverages, Ready-made Food, Drinks etc. Cereals, Pulses, Edible oil and Fats, Tea and Coffee, Miscellaneous Food items.
<b>Health</b>	Medical care
<b>Housing and Utilities</b>	Housing rent and Housing expenses, Chinaware, Earth ware, Plastic ware, and other households effects. Fuel and Lighting , Communication (Telephone, telegraph, internet etc )
<b>Education</b>	Educational and Professional stationary Supplies Expenditure.
<b>Recreation</b>	Recreation and Reading
<b>Consumer Non-durables</b>	Personal Care Services, Personal Care Articles, Households Laundry cleaning and paper article, Clothing, Clothing material land services, Footwear and repair charges, Personal effects and Services and repair charges.
<b>Other</b>	Transport expenditure, Taxes and fine and all other miscellaneous expenditure, Tobacco and Chewing product,
<b>Durables</b>	Households textile and Personal effects, Kitchen appliances, Furniture, Fixture and Furnishing, Other Households effects, TV, VCP/VCR, Radio, Cassette player, Computer, Miscellaneous expenditure

#### 4.3.2. Economic indicators

A number of economic indicators are considered as explanatory variables. These include foreign and domestic remittances, household wealth, number of adult household members at work and the employment status of household head.

Following Adams (2005) and Castaldo and Reilly (2007), we take binary measures of remittances as our primary remittance indicators. This choice is motivated by several reasons: Monetary measures of remittances are prone to measurement errors, as households may be unable or unwilling to precisely recall the amount they received during the year prior to the survey from a household member living away from home. These measurement errors may in turn be correlated with those in household expenditure and other monetary values in the model. Besides, relatively few observations for monetary value of remittances are available in the PSLM dataset (497 and 1433 for foreign and domestic remittances respectively).

Household wealth has important repercussions on the expenditure indicators as wealthier households usually have higher total expenditures and spend more on education, health, housing and other categories of consumption. Household wealth status is proxied by an asset index<sup>1</sup> that consists of 29 indicators of property ownership, quality of housing and access to amenities. Principal Component Analysis (PCA) is used to obtain the first component of the assets holding index in order to explain the largest amount of information common to the constituent variables.

The income and expenditures of a household are crucially affected by whether and how many of its members work. Higher number of working household members may imply higher income resulting in greater consumption.

Household spending on different consumption categories also depends on the incidence and extent of household poverty. Poor households need to spend proportionally more on food, health and other necessities and can spare little for education, durable items and recreation. Indicators for two poverty levels are therefore included: US \$1.25 and \$2.5. Households' below these purchasing power parity poverty lines are considered poor and extremely poor respectively. The indicators are calculated by using annualized per capita adult equivalent household income. A modified OECD equivalence scale is employed assigning weights of 1, 0.5 and 0.3 to the household head, other adults and minors at home respectively. Household incomes in Rupees are converted into US Dollars by using an average exchange rate of Rs. 85.19381633 per US Dollar for the year 2010-2011. The corresponding household income thus calculated for the \$1 and \$2 poverty line is Rupee 38869.67870 and 77739.35739. Using these figures, the country's \$1 and \$2 poverty rates are estimated to be 24.3% and 76.5% respectively.

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<sup>1</sup> Available upon request.

#### *4.3.3. Socio-Demographic indicators:*

The level of household consumption depends on the household's demographic composition (Ando and Modigliani, 1963). Household size, number of children, adults and the elderly determine the specific needs and drives household spending in different expenditure categories. A household with higher share of dependents implies higher propensity to consume, and consequently a lower per capita level of consumption (Adams and Cuecuecha, 2010). Similarly, education, health and food budgets for the latter two are usually different from those of the adults. A larger household may be able to obtain economies of scale in food, housing and other expenses by sharing, transport and pooling the knowledge, space and materials involved in their production.

The number of educated members in a household also influences the household's consumption patterns. Educated individuals are better aware of health and sanitary issues and spend more on education and food.

The above mentioned socio demographic factors are controlled for in the study by including variables for household size, dependency ratio and number of literate adults in the household. Dependency ratio is defined as the share of children (less than 18 years old) and the elderly (60 years or above) in the household. Literacy pertains to the ability of an adult to read a newspaper with understanding, to write a simple letter and perform simple sums.

A household's spending pattern to a large extent reflects the consumption preferences and priorities of its head. An old head may prioritize health expenditure over education and housing. A head's age, sex, marital and employment status and level of education are therefore important in understanding a household's consumption behaviour.

#### *4.3.4. Locational variables*

Differences in consumption patterns partly owe to geography: rural and more distant areas have proportionally higher transportation costs while urban areas in the developing countries usually face higher food prices. Similarly, households in agricultural provinces spend less on food and clothing. Indicators for urban - rural and province of residence are therefore included in the baseline model. The indicator for urban residence takes a value of one if the household resides in urban area and zero otherwise. The categorical variable for provincial residence takes Punjab as the baseline. Punjab is the most populous province of Pakistan, accounting for 56% of the country's population.

In developing countries, distance from public services such as schools, hospitals, public transport and drinking water facilities varies widely with provision to households in poor localities usually far below those available in federal and provincial capitals or well-to-do areas. These distances are reflected in the household's consumption patterns. This factor is included in the model by constructing a distance index<sup>2</sup> based on Principal Component Analysis of a set of variables indicating the household's distance in minutes from various public services.

## **5. Findings**

### **5.1. Working Leser estimations**

Tables 7 and 8 show results of OLS and Tobit estimations of Working Leser specifications for the amounts of various household expenditures. The relationship between foreign remittances and expenditure is found to be statistically insignificant in six out of eight spending categories (Table 7). Only housing and utilities and health show a weakly significant association with foreign remittances, both with a negative sign indicating lower housing and health expenditures among households receiving foreign remittances. Among other variables included in the model, most demographic variables exhibit a significant association with household expenditures. For example, larger households have significantly higher expenditures on food and consumer items and lower spending on health, housing, recreation and durables. Household spending on food, health and durables increases with its head's age. Likewise, education spending increases with head's education as well as the number of literates at home. A household with a working head spends more money on food than one whose head is not at work.

Among households' economic indicators, food expenditures decrease with household's total spending and asset ownership. Households who own cultivated land have higher food expenditure and lower education spending, suggesting a low priority given to human capital development. Distance from amenities does not appear to influence households' spending patterns. Households' residence in rural or urban area or a particular province of also substantially modifies the consumption patterns.

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<sup>2</sup> Available upon request

**Table 7.** Foreign remittances and household expenditures (OLS and Tobit estimations)

	Food	Health	Education	Housing	Recreation	Cons. Non-durable	other	Durable
Log (Total expenditure)	-5.438*** (0.000)	0.182 (0.417)	2.734*** (0.000)	-1.371 (0.198)	-0.236*** (0.000)	-2.948*** (0.000)	4.276*** (0.000)	3.791*** (0.000)
Foreign remittances	1.001 (0.114)	-0.429* (0.078)	0.208 (0.670)	-1.151* (0.060)	-0.070 (0.278)	0.172 (0.456)	0.070 (0.900)	0.096 (0.811)
Assets	-0.619*** (0.000)	-0.219*** (0.000)	0.196*** (0.006)	0.712*** (0.000)	0.216*** (0.000)	0.141*** (0.001)	-0.140 (0.159)	0.114 (0.131)
Distance	0.100 (0.397)	-0.000 (0.995)	-0.097 (0.323)	-0.076 (0.515)	-0.045* (0.055)	-0.172*** (0.000)	0.299*** (0.000)	0.046 (0.425)
Cultivated land	9.123*** (0.000)	-0.167 (0.338)	-1.294*** (0.000)	-4.208*** (0.000)	-0.022 (0.653)	-1.179*** (0.000)	-2.240*** (0.000)	-0.497* (0.070)
Household size	0.924*** (0.000)	-0.082** (0.011)	0.084* (0.062)	-0.782*** (0.000)	-0.010 (0.253)	0.327*** (0.000)	-0.195*** (0.002)	-0.198*** (0.001)
Dependency ratio	-2.715*** (0.002)	0.650* (0.088)	6.809*** (0.000)	2.112** (0.043)	-0.047 (0.668)	0.175 (0.549)	-0.381 (0.586)	-2.044*** (0.001)
Number of schooling18	-0.429*** (0.003)	0.120** (0.026)	0.296*** (0.001)	0.338** (0.024)	0.011 (0.504)	0.186*** (0.000)	-0.102 (0.339)	-0.079 (0.435)
Sex of head	0.910 (0.184)	-0.175 (0.628)	2.263*** (0.000)	-0.797 (0.264)	-0.122 (0.121)	0.564** (0.020)	-2.418*** (0.000)	0.665 (0.250)
Age head	-0.163** (0.012)	-0.107** (0.029)	0.569*** (0.000)	-0.045 (0.438)	0.003 (0.611)	0.013 (0.539)	0.167*** (0.001)	-0.062 (0.137)
Age head_squ	0.002*** (0.005)	0.001** (0.019)	-0.006*** (0.000)	0.001 (0.339)	-0.000 (0.719)	-0.000 (0.340)	-0.002*** (0.001)	0.000 (0.327)
Married head	0.032 (0.952)	-0.626 (0.152)	0.413 (0.274)	-1.923*** (0.001)	0.003 (0.963)	0.525*** (0.002)	0.460 (0.255)	1.085*** (0.001)
Education head	0.133 (0.302)	-0.120* (0.082)	0.281*** (0.000)	-0.066 (0.645)	0.042*** (0.004)	-0.028 (0.517)	0.051 (0.614)	-0.412*** (0.000)
Work of head	1.263*** (0.007)	-0.067 (0.740)	0.059 (0.884)	-1.038** (0.036)	0.012 (0.805)	0.082 (0.623)	0.411 (0.330)	0.195 (0.531)
Region	-3.217*** (0.000)	-0.234 (0.139)	0.782*** (0.002)	6.600*** (0.000)	0.538*** (0.000)	-1.016*** (0.000)	-2.010*** (0.000)	-1.315*** (0.000)
1.province	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)
2.province	0.914** (0.045)	-0.730*** (0.000)	-1.677*** (0.000)	1.387** (0.023)	0.744*** (0.000)	-1.344*** (0.000)	2.291*** (0.000)	-1.481*** (0.000)
3.province	-1.109** (0.048)	1.971*** (0.000)	0.751*** (0.008)	0.497 (0.372)	-0.103 (0.103)	-0.915*** (0.000)	-0.244 (0.534)	-0.859** (0.011)
4.province	1.073* (0.092)	-1.364*** (0.000)	-2.361*** (0.000)	0.546 (0.400)	0.155* (0.096)	1.739*** (0.000)	1.474*** (0.003)	-2.258*** (0.000)
_cons	106.47*** (0.000)	5.908*** (0.001)	-50.02*** (0.000)	43.711*** (0.000)	1.004 (0.107)	43.554*** (0.000)	-39.67*** (0.000)	-41.09*** (0.000)
Number of observations	9,120	9,120	9,120	9,120	9,120	9,120	6,199	9,120
R-Squared	0.369	0.065		0.296		0.245	0.092	

Note: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 8.** Domestic remittances and household expenditures (OLS and Tobit estimations)

	Food	Health	Education	Housing	Recreation	Consumer non-durable	Other	Durable
Log (Total expenditure)	-5.418*** (0.000)	0.176 (0.427)	2.742*** (0.000)	-1.406 (0.186)	-0.239*** (0.000)	-2.942*** (0.000)	4.590*** (0.000)	3.796*** (0.000)
Foreign remittances	-1.387** (0.016)	0.953*** (0.002)	0.281 (0.438)	0.055 (0.912)	-0.141** (0.022)	0.160 (0.399)	-0.312 (0.442)	0.398 (0.297)
Assets	-0.610*** (0.000)	-0.22*** (0.000)	0.200*** (0.005)	0.696*** (0.000)	0.215*** (0.000)	0.144*** (0.001)	-0.121 (0.272)	0.117 (0.125)
Distance	0.090 (0.449)	0.006 (0.889)	-0.096 (0.326)	-0.072 (0.539)	-0.045* (0.055)	-0.172*** (0.000)	0.289*** (0.001)	0.048 (0.411)
Cultivated land	9.138*** (0.000)	-0.174 (0.315)	-1.373*** (0.000)	-4.220*** (0.000)	-0.022 (0.657)	-1.178*** (0.000)	-1.828*** (0.000)	-0.498* (0.069)
Household size	0.922*** (0.000)	-0.080** (0.012)	0.085* (0.059)	-0.784*** (0.000)	-0.010 (0.229)	0.327*** (0.000)	-0.199*** (0.005)	-0.197*** (0.001)
Dependency ratio	-2.695*** (0.002)	0.633* (0.094)	6.799*** (0.000)	2.127** (0.042)	-0.042 (0.704)	0.169 (0.563)	-1.017 (0.136)	-2.056*** (0.001)
Number of schooling18	-0.431*** (0.003)	0.120** (0.026)	0.294*** (0.002)	0.343** (0.022)	0.011 (0.479)	0.185*** (0.000)	-0.219* (0.053)	-0.081 (0.426)
Sex of head	1.571** (0.022)	-0.564 (0.108)	1.820*** (0.000)	-1.105 (0.118)	-0.103 (0.203)	0.560** (0.021)	-2.561*** (0.000)	0.572 (0.330)
Age head	-0.170*** (0.009)	-0.104** (0.033)	2.232*** (0.000)	-0.036 (0.532)	0.004 (0.547)	0.011 (0.585)	0.087* (0.074)	-0.063 (0.133)
Age head_squ	0.002*** (0.003)	0.001** (0.023)	-0.006*** (0.000)	0.000 (0.421)	-0.000 (0.661)	-0.000 (0.371)	-0.001 (0.121)	0.000 (0.321)
Married head	0.121 (0.818)	-0.671 (0.128)	0.421 (0.268)	-1.997*** (0.001)	0.000 (0.994)	0.533*** (0.002)	0.924** (0.025)	1.085*** (0.001)
Education head	0.119 (0.354)	-0.113 (0.101)	0.280*** (0.000)	-0.053 (0.708)	0.042*** (0.004)	-0.030 (0.499)	0.170* (0.094)	-0.411*** (0.000)
Work of head	1.035** (0.023)	0.070 (0.733)	0.072 (0.861)	-0.948* (0.054)	0.004 (0.931)	0.087 (0.598)	-0.372 (0.403)	0.229 (0.465)
Region	-3.320*** (0.000)	-0.173 (0.284)	0.785*** (0.002)	6.649*** (0.000)	0.535*** (0.000)	-1.016*** (0.000)	-2.120*** (0.000)	-1.301*** (0.000)
1.province	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)
2.province	0.798* (0.082)	-0.66*** (0.000)	-1.667*** (0.000)	1.428** (0.020)	0.739*** (0.000)	-1.340*** (0.000)	2.088*** (0.000)	-1.460*** (0.000)
3.province	-1.019* (0.066)	1.923*** (0.000)	0.755*** (0.008)	0.435 (0.435)	-0.102 (0.110)	-0.910*** (0.000)	-0.405 (0.278)	-0.866*** (0.009)
4.province	0.973 (0.128)	-1.30*** (0.000)	-2.343*** (0.000)	0.558 (0.393)	0.147 (0.114)	1.748*** (0.000)	1.315*** (0.005)	-2.232*** (0.000)
_cons	106.660** * (0.000)	5.730*** (0.001)	- 50.124*** (0.000)	43.916*** (0.000)	1.053* (0.091)	43.479*** (0.000)	-41.15*** (0.000)	- 41.204*** (0.000)
Number of observations	9,121	9,121	9,121	9,121	9,121	9,121	9,121	9,121
R-Squared	0.370	0.068		0.296		0.246	0.110	

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Receipt of domestic remittances is significantly associated with three expenditure categories, two of which statistically significant at the 1% level. Recipient households have lower food and recreation expenditures and higher health spending. This suggests generally low incomes of domestic remittance receiving households (average annual income being Rs. 172,900 as compared to Rs. 223,309 for non-recipient households). In contrast, households with international transfers are at an average richer (average annual income being Rs. 342,627 as

compared to Rs. 175,672 for non-recipient households), and do not significantly differ from non-recipient households in their food or recreation spending.

Estimations on budget share of various consumption categories corroborate the above discussed findings<sup>3</sup>. The marginal effects of international and domestic remittances for various model specifications are given in Table 9. Marginal shares of international remittances for six out of eight consumption categories are found to be insignificant, just like the amounts of expenditure on those categories. Share of health spending in the household budget shows a significant decrease from 3.2% to 2.77%. In other words, the share of health expenditure in the budget of foreign remittance-receiving households is 13.4% lower than that among non-recipient households, *ceteris paribus*. Also, share of housing expenditure is found to be proportionally lower among foreign remittance receiving households (26.3% as compared to 27.4%) showing a 4.2% lower share.

**Table 9.** Marginal Shares in Household Budget by Access to Foreign remittances

Items	Households with remittances	Households without remittances	Difference	z -stat	P> z
<b>Foreign Remittances</b>					
Food	39.73658	38.73554	1.001043	1.58	0.114
Education	2.293482	2.085531	.2079511	0.43	0.670
Health	2.770114	3.199359	-.4292442	-1.76	0.078
Housing and Utilities	26.28651	27.43714	-1.150632	-1.88	0.060
Recreation	-.0038411	.0658233	-.0696643	-1.09	0.278
Consumer non-durables	10.8146	10.64252	.1720843	0.75	0.456
Miscellaneous	14.19693	14.05306	.1438711	0.26	0.797
Durables	.6358827	.5397715	.0961112	0.24	0.811
<b>Domestic Remittances</b>					
Food	37.52479	38.91133	-1.386533	-2.42	0.016
Education	2.352922	2.071936	.2809863	0.78	0.438
Health	4.045246	3.092384	.9528617	3.11	0.002
Housing and Utilities	27.42554	27.37097	.0545736	0.11	0.912
Recreation	-.0666732	.0743118	-.140985	-2.29	0.022
Consumer non-durables	10.7977	10.6377	.1599976	0.84	0.399
Miscellaneous	13.77583	14.08811	-.3122784	-0.77	0.442
Durables	.9078644	.5100496	.3978148	1.04	0.297

<sup>3</sup> Estimations not shown to conserve space.

Marginal effects of domestic remittances on different expenditure brackets are generally intuitive. Share of health spending shows the biggest difference with a share of 4% for recipient households as compared to 3.1% for the non-recipient ones, indicating a substantial difference of 30.8% between the healthcare spending shares of the two kinds of households.

Shares of food and recreation spending show less substantial differences for the two household types, the two shares are lower by 3.6% and 11.6% respectively.

Poor households (those earning under \$2.50 per capita adult equivalent per day) and those living in extreme poverty (those earning under \$1.25 per capita adult equivalent per day) show somewhat different consumption patterns (Table 10 and 11). Extremely poor foreign remittance receiving households spend lower share of their budget on education than non-recipient households do. On the other hand, consumption behaviour of poor households does not statistically differ regardless of whether or not they receive remittances from overseas.

In contrast, poor and extremely poor households receiving domestic remittances statistically differ in their spending preferences from non-recipient households in three and four out of eight spending categories respectively. Both poor and extremely poor households spend lower budget share on recreation and miscellaneous items. Extremely poor households spend higher proportion of their budget on housing and utilities, while poor households spend higher budget shares on health and education than their non-recipient counterparts.

**Table 10.** Marginal shares in household budget - Poor households

Items	Households with remittances	Households without remittances	Difference	z -stat	P> z
<b>Foreign Remittances</b>					
Food	42.48981	41.49221	.9975939	0.99	0.321
Education	1.318421	1.522631	-.2042094	-0.51	0.607
Health	3.197289	3.391121	-.1938313	-0.56	0.577
Housing and Utilities	25.29059	26.35493	-1.064335	-1.44	0.149
Recreation	-.3091244	-.2209889	-.0881355	-0.86	0.387
Consumer non-durables	11.71293	11.52581	.1871141	0.60	0.551
Miscellaneous	13.02019	12.95031	.069878	0.13	0.900
Durable	.4946494	.1227833	.371866	0.86	0.388
<b>Domestic Remittances</b>					
Food	40.63249	41.61604	-.9835506	-1.61	0.108
Education	1.902489	1.477959	.4245298	1.38	0.167
Health	4.160376	3.307113	.8532636	2.56	0.010
Housing and Utilities	26.08139	26.34154	-.2601519	-0.51	0.614



Recreation	-.3924275	-.2077073	-.1847202	-2.47	0.013
Consumer non-durables	11.80279	11.50554	.29725	1.29	0.199
Miscellaneous	12.34618	13.01287	-.6666954	-1.87	0.061
Durables	.5642422	.0936725	.4705697	1.32	0.185

**Table 11.** Marginal shares in household budget - Extremely poor households

Items	Households with remittances	Households without remittances	Difference	z –stat	P> z
<b>Foreign Remittances</b>					
Food	45.8591	42.13715	3.721952	1.12	0.262
Education	-.2773233	.978936	-1.256259	-2.52	0.012
Health	4.467064	3.694262	.772802	0.67	0.505
Housing and Utilities	20.56643	26.41012	-5.84369	-4.92	0.000
Recreation	-.7138061	-1.164207	.4504007	1.02	0.309
Consumer non-durables	12.64329	12.85606	-.2127711	-0.34	0.731
Miscellaneous	13.35487	12.00278	1.352096	1.10	0.270
Durable	1.223053	-.3358766	1.55893	1.27	0.205
<b>Domestic Remittances</b>					
Food	41.46129	42.24528	-.7839908	-0.66	0.511
Education	1.3851	.9265047	.458595	1.03	0.302
Health	3.691496	3.704444	-.0129481	-0.03	0.979
Housing and Utilities	27.8492	26.20673	1.642461	1.69	0.092
Recreation	-1.639681	-1.114591	-.5250906	-2.56	0.011
Consumer non-durables	13.05553	12.83521	.2203164	0.42	0.673
Miscellaneous	10.91281	12.11784	-1.205024	-1.92	0.055
Durable	-.4142085	-.3099727	-.1042358	-0.25	0.799

Comparing the results related to foreign and domestic remittances, domestic remittance receiving households show a robust preference for expenditure on health and low preference for recreation spending. Foreign remittance recipients, on the other hand, show little significant difference in their spending behaviour compared with non-recipient households, with a minor change in spending on human capital development. However, as mentioned earlier, OLS estimations do not take into consideration selection bias arising from observable and unobservable household and individual characteristics, and should therefore need to be interpreted with caution.

## 5.2. PSM estimations

Tables 12 - 15 give results of Propensity Score Matching estimations for foreign and domestic remittances. Results of Gaussian Kernel matching, Radius matching and Nearest Neighbour matching are quite similar<sup>4</sup>. However, only Kernel estimations are shown. Tables 12 and 13 give matching results for the amount of spending on various consumption categories. Both foreign and domestic remittance receiving households appear to be significantly different from their non-recipient counterparts in four out of eight categories. Foreign remittance receiving households spend more on food items, consumer non-durables, durables and miscellaneous goods. Increase in spending on durable goods appears to be the highest, reflecting the households' spending preference in favour of physical capital accumulation. Importantly, no significant difference in spending on education or health is discernable. It can be noticed that the difference in Average Treatment Effect in Treatment (ATT) between treated and control groups is invariably smaller than the unmatched difference. For the four categories of food, consumer non-durables, durables and miscellaneous items, the corresponding ATT and unmatched differences respectively are 0.1 and 0.28, 0.08 and 0.33, 0.45 and 1.28, and 0.12 and 0.37.

This indicates that use of matching techniques in this study was warranted as unmatched difference estimated are twice or thrice as big as matching estimates.

**Table 12.** Foreign remittances and household expenditures (Gaussian Kernel matching)

Expenditure Category	Sample	Treated	Control	Matched diff	t-stat
<b>Total</b>	Unmatched	12.5461514	12.1662361	.379915319	12.95
	ATT	12.5461514	12.4436096	.102541845	2.87
<b>Food</b>	Unmatched	11.4488173	11.1640632	.284754087	10.43
	ATT	11.4488173	11.3382707	.110546549	3.47
<b>Health</b>	Unmatched	8.62514392	8.27672431	.348419606	6.18
	ATT	8.62514392	8.62041905	.004724867	0.07
<b>Housing</b>	Unmatched	11.1661649	10.8007747	.365390144	10.33
	ATT	11.1661649	11.0899202	.076244646	1.78
<b>Education</b>	Unmatched	7.57987224	6.30814573	1.27172651	6.67
	ATT	7.57987224	7.48226277	.097609465	0.43
<b>Recreation</b>	Unmatched	4.46108986	3.96157301	.499516848	2.75
	ATT	4.46108986	4.47409725	-.013007391	-0.06
<b>Consumer Non-durable</b>	Unmatched	10.2066351	9.88011433	.326520813	11.65
	ATT	10.2066351	10.1244452	.082189987	2.47
<b>Other</b>	Unmatched	10.4182352	10.0515478	.366687387	7.78
	ATT	10.4182352	10.293642	.124593145	2.20
<b>Durable</b>	Unmatched	6.52361517	5.24525945	1.27835572	7.28
	ATT	6.52361517	6.07670687	.446908302	2.14

<sup>4</sup> Results for Radius and nearest neighbour matching available upon request.

**Table 13.** Domestic remittances and household expenditures (Gaussian Kernel Matching)

Expenditure Category	Sample	Treated	Control	Matched diff	t-stat
<b>Total</b>	Unmatched	12.1265255	12.1897513	-.063225735	-2.56
	ATT	12.126314	12.1632327	-.036918745	-1.36
<b>Food</b>	Unmatched	11.0882192	11.1853141	-.097094926	-4.24
	ATT	11.0875297	11.1408789	-.053349255	-2.01
<b>Health</b>	Unmatched	8.43806051	8.28271194	.155348565	3.29
	ATT	8.43924175	8.33994412	.099297631	1.67
<b>Housing</b>	Unmatched	10.7382897	10.8253467	-.087056966	-2.93
	ATT	10.7380116	10.7947111	-.056699451	-1.84
<b>Education</b>	Unmatched	6.67322619	6.34787506	.325351131	2.04
	ATT	6.68323103	6.63767861	.045552423	0.26
<b>Recreation</b>	Unmatched	3.02830316	4.06174371	-1.03344055	-6.81
	ATT	3.03284334	3.4535786	-.420735258	-2.60
<b>Consumer Non-durable</b>	Unmatched	9.86560506	9.8987872	-.03318214	-1.41
	ATT	9.86486195	9.87064103	-.005779082	-0.22
<b>Other</b>	Unmatched	9.8677683	10.0857019	-.217933594	-5.52
	ATT	9.86776033	9.93776153	-.070001197	-1.53
<b>Durable</b>	Unmatched	5.45933272	5.2973228	.162009924	1.10
	ATT	5.45812437	5.31968308	.138441291	0.84

Unlike households receiving international transfers, domestic remittance recipients spend less on three of the total eight consumption categories compared with their non-recipient counterparts, namely food items, housing and utilities, and recreation (Table 13). Again, lower food expenditure than comparable non recipient households reflects the relatively less prosperous financial situation of households receiving domestic remittances. However, as found in Working Leser specifications, they spend more on healthcare than non-recipient households. The increase in health spending is in absolute terms as well as relative to other spending categories (Table 13, 15). health spending is one of the two categories on which domestic remittance receivers spend proportionally more than non-recipient households, the other being consumer non-durables. In fact, health expenditure of recipient households is at an average 20.7% higher than that of non-recipients (4.3% among recipient households compared to 3.6% among non-recipient households).

As shown above, recreation spending is lower among domestic remittance receivers than among non-recipients.

Budget shares of various expenditure categories among households receiving foreign remittances (Table 14) again show a behaviour different from those receiving domestic remittances (Table 15). Shares of none of the consumption categories indicate a significant difference between foreign remittance receiving and non-receiving households. This result would suggest that households receiving international remittances treat those transfers as

another source of income and do not modify their spending preference in response to those receipts.

**Tables 14.** Foreign remittances and household expenditure shares (Kernel Matching)

Expenditure Category	Sample	Treated	Control	Matched diff	t-stat
<b>Food</b>	Unmatched	35.5617381	38.6641969	-3.10245881	-5.56
	ATT	35.5617381	35.5322183	.02951975	0.04
<b>Health</b>	Unmatched	3.14940496	3.19460438	-.04519942	-0.24
	ATT	3.14940496	3.54834155	-.398936596	-1.90
<b>Housing</b>	Unmatched	27.3409626	27.5465634	-.205600779	-0.39
	ATT	27.3409626	27.9850515	-.644088821	-1.02
<b>Education</b>	Unmatched	5.94208807	3.33295201	2.60913606	10.12
	ATT	5.94208807	5.14247963	.79960844	1.93
<b>Recreation</b>	Unmatched	.4732211	.54970731	-.07648621	-1.95
	ATT	.4732211	.478734424	-.005513325	-0.11
<b>Consumer Non-durable</b>	Unmatched	10.3171718	10.8550282	-.537856448	-2.96
	ATT	10.3171718	10.5867499	-.269578119	-1.25
<b>Other</b>	Unmatched	14.1873332	14.1804815	.006851683	0.02
	ATT	14.1873332	14.1463664	.040966804	0.08
<b>Durable</b>	Unmatched	3.02919418	1.67806853	1.35112565	5.84
	ATT	3.02919418	2.58136111	.447833068	1.24

**Table 15.** Domestic remittances and household expenditure shares (Kernel Matching)

Expenditure Category	Sample	Treated	Control	Matched diff	t-stat
<b>Food</b>	Unmatched	37.5842802	38.5824057	-.998125488	-2.14
	ATT	37.5676162	38.1099702	-.542353962	-1.04
<b>Health</b>	Unmatched	4.30984248	3.10404862	1.2057938	7.61
	ATT	4.31482312	3.57417114	.740651973	3.43
<b>Housing</b>	Unmatched	26.9697439	27.5820181	-.61227416	-1.40
	ATT	26.9710724	27.6338501	-.66277767	-1.40
<b>Education</b>	Unmatched	4.51842597	3.37949968	1.13892629	5.27
	ATT	4.52519951	4.23864144	.28655807	0.98
<b>Recreation</b>	Unmatched	.338544085	.562212582	-.223668497	-6.83
	ATT	.339050942	.41092475	-.071873808	-2.38
<b>Consumer Non-durable</b>	Unmatched	11.1548016	10.8025679	.352233665	2.32
	ATT	11.1492443	10.7807392	.368505049	2.10
<b>Other</b>	Unmatched	12.8303993	14.2869331	-1.4565338	-4.58
	ATT	12.8359606	13.197056	-.36109536	-0.95
<b>Durable</b>	Unmatched	2.29566177	1.70188284	.593778929	3.07
	ATT	2.29873279	2.05629607	.24243672	0.98

## 6. Discussion

The effect of remittances on consumption behaviour of recipient households depends on how remittances are perceived by the households. If they are considered part of the household's permanent income, they will be spent like any other income source, and would not lead to any substantial change in the household's spending pattern. On the other hand, if they are treated as a temporary source of income, they will probably be used on priority expenditures and may

therefore lead to higher spending on the household's human capital development. In this study, we argue that these two hypotheses need not be mutually exclusive, and may co-exist depending on the nature of remittances and household characteristics.

Our findings indicate that foreign remittance receiving households do not differ substantially in consumption behaviour from non-receiving households. Likewise, no robust inference can be drawn regarding foreign remittances' proclivity to improve the household's spending on education and health. This lack of remittances' significant effect on recipient households' spending preferences corroborates the findings of Adams et al. (2008) in the context of Ghana.

On the other hand, we find some evidence for change in spending behaviour of domestic remittance receiving households. The share of food consumption and recreation in domestic remittance recipients is lower and that of health spending higher as compared to non-recipient households. This suggests domestic remittances' beneficial impact on human capital accumulation. Increase in health spending among remittance receiving households is probably meant for out of pocket health expenditures. In Pakistan, public health care services are generally inadequate and the country has lagged behind other South Asian countries in this regard. As a result, well-off households have increasingly resorted to private service providers for healthcare provision.

The difference between consumption patterns of households receiving international and domestic remittances may lie in the economic situation of those households. International remittances, especially those migrants settled in North America or Europe or workers residing since long in Gulf States, are usually higher and often go to more prosperous households.

Better financial wherewithal of these households implies that basic necessities are met and additional income source in the form of receipts from abroad no more alters the households' spending preferences.

Domestic remittance receiving households, on the other hand, are at an average poorer, and may still have unmet basic consumption needs. Greater spending on health care may therefore result from this additional source of income. This corroborates the argument of Clément (2011) in the context of Tajikistan that improving health outcomes is a short-term priority that comes before more long-term investments such as education or agriculture. Moreover, the finding that food spending among domestic remittance receiving households is lower than

non-receiving households supports Engel's law, a finding also found in Adams (2005), Castaldo and Reilly (2007) and Tabuga (2007).

The finding that spending patterns of extremely poor households differ from the rest of the population also supports the argument that differences in consumption preferences among remittance receiving and non-receiving households are mainly due to differences in economic conditions of the two groups of households.

The propensity to spend on various consumption items may vary with receipt of remittances at low levels of household income. However, beyond a certain level, remittances are perceived as fungible and no more alter the receiving households' expenditure preferences.

## **7. Robustness and sensitivity checks**

The quality of analysis based on propensity score matching depends on the validity of the underlying assumptions of common support, balancing and conditional independence. Figures A-1 to A-3 and table A-1 show tests for these assumptions. Figures A-1 and A-2 show density distributions for the estimated propensity scores for receiving and non-receiving households for foreign and domestic remittance recipients respectively, while Figures A-3 to A-5 show pre- and post-matching bias reduction for Gaussian kernel matching estimations. The conditions of common support and balancing appear to be somewhat satisfied. The common support region of the dataset is nonetheless limited as there is limited overlap between the households in the treatment and control groups. However, the characteristics of the constructed recipient and non-recipient households are mostly comparable.

Conditional independence is tested through Rosenbaum bounds test<sup>5</sup>. The test indicates mixed evidence for conditional independence, suggesting that the odds of unobservable characteristics influencing the average treatment effects cannot be satisfactorily rejected, and the findings of matching analysis may be sensitive to hidden bias.

## **8. Concluding remarks**

This study examined consumption patterns of Pakistani households in the context of international and domestic remittances by using the representative Pakistan Social and Living Standards Measurement survey. Marginal propensities to consume goods and services from eight expenditure categories were estimated for both kinds of remittances. Estimations were

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<sup>5</sup> The findings are estimated using Stata's rbounds user module are available upon request.

carried out in the Working Leser consumption framework as well as a propensity score matching setting. A number of conclusions can be drawn from the study:

First, although expenditure on some items is higher among households receiving foreign remittances, no significant difference in the share of household budget allocated to any consumption category could be discerned. This suggests that international remittances are mainly considered a fungible income source by the receiving households and thus spent like any other source of income. This finding is in line with conclusions of Adams et al. (2008) who found remittances to be fungible in case of Ghana. It is worth remarking that both Ghana and Pakistan are low middle income developing countries at similar levels of development. Secondly, although spending on several expenditure categories is similar among the recipients and non-recipients of domestic remittances, health care spending is substantially higher among domestic remittance receiving households. As a result, domestic remittances cannot be deemed as entirely fungible. This positive impact of remittances on health spending is in line with the findings of previous studies such as Acosta et al. (2008), Adams (2005) and Clément (2011).

Third, differences in consumption patterns owing to foreign and internal remittances may be due to different income levels of the two sets of households. International remittance receiving households in Pakistan are at an average more prosperous than domestic remittance receiving households, and probably enjoy different level of consumption satisfaction. In the same vein, differences in consumption patterns are also clearly visible among poor and extremely poor recipient households.

Fourth, as regards remittances being spent in a productive manner, evidence from this study is mixed. While foreign remittances are spent no more or less productively than the rest of migrant households' income, proportionally more domestic remittances are spent on health care. Nonetheless, there is no evidence of remittances raising the share of 'unproductive expenditures' such as conspicuous spending on social ceremonies and status-oriented consumer products.

To sum up, remittances are not a panacea for the ailments a developing economy suffers through. Nor is there scope of an overly pessimistic view of remittances as an unproductive waste of resources. Rather, their use corresponds to the financial situation of the recipient households and their economic needs.

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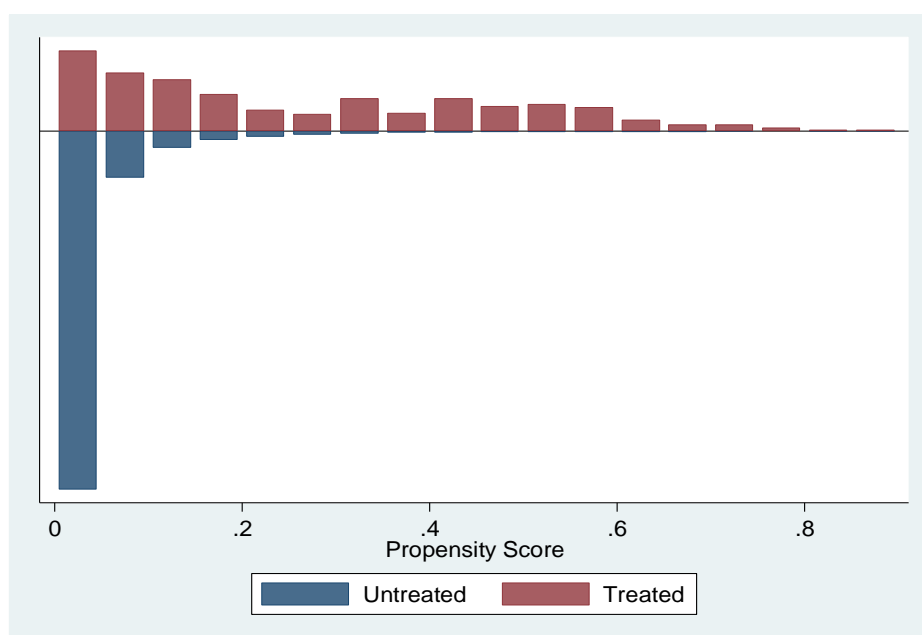


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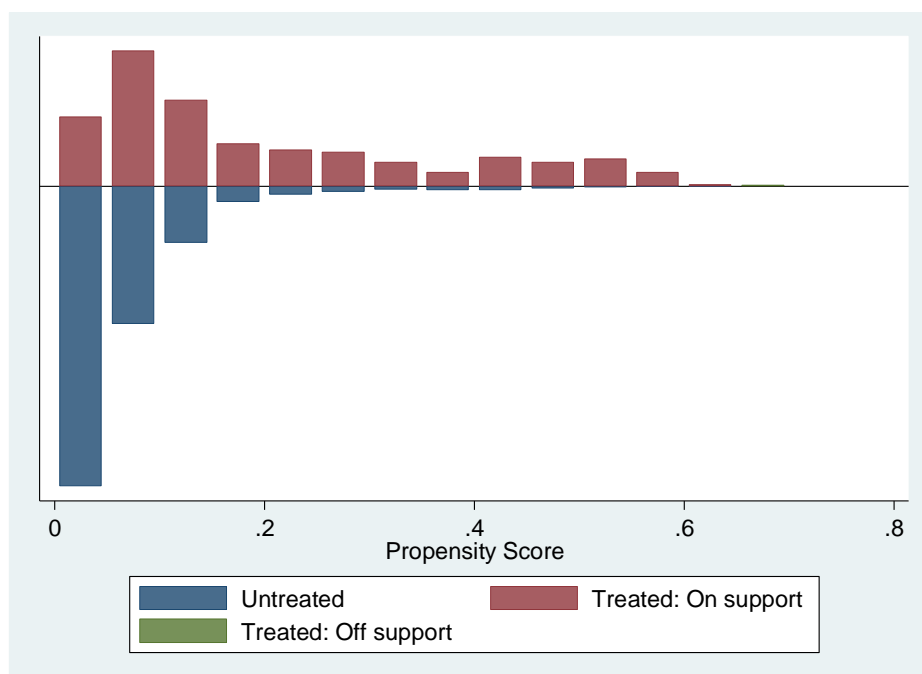
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## Appendix

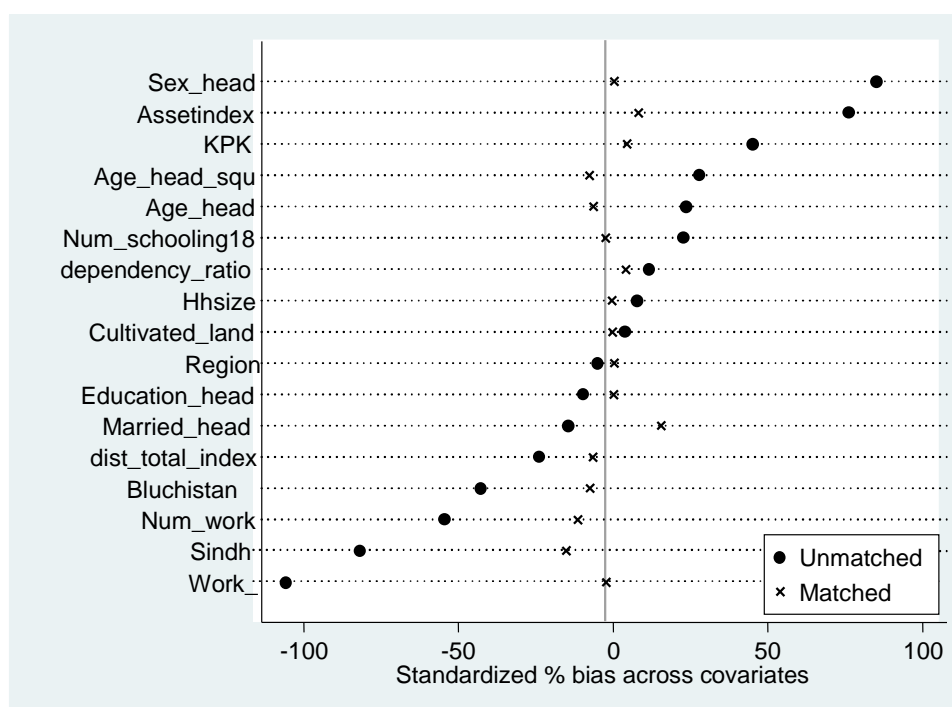
**Figures A-1** Density distributions for the estimated propensity scores for foreign remittance receiving and non-receiving households



**Figures A-2** Density distributions for the estimated propensity scores for domestic remittance receiving and non-receiving households



**Figure A-3** Pre- and post-matching bias reduction for Kernel matching estimations.



**Table A-1** Quality of matching indicators:

Test indicator	
Before Matching	
Mean absolute bias	37.73379
Pseudo $R^2$	0.323
LR $\chi^2$ (P-value)	1168.56 (0.000)
After matching using kernel based matching	
Mean absolute bias	5.5
Pseudo $R^2$	0.026
LR $\chi^2$ (P-value)	32.19 (0.014)