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Foreign Remittances and Household Poverty: Evidence from Pakistan

Faisal Mehmood Mirza, Muhammad Saim Hashmi, Saima Iqbaland Asif Iqbal[1]

Abstract

This paper evaluates the impact of foreign remittances on household incomes and poverty using household data in Pakistan. Employing propensity score matching method, average treatment effects on treated suggest that remittances increase per capita income by 45 percent when compared to per capita income of households that do not receive remittances. Poverty results suggest that remittances reduce the probability of households getting under poverty line by 30 percent. This percentage is higher for rural households at 36 percent than the urban households at 23 percent. Findings suggest that government should facilitate expatriate Pakistanis in sending remittances to their home country.

Key Words: Foreign Remittances, Poverty, Pakistan

JEL Classification: F22, F16, O15

1. Introduction

Remittances are becoming an increasingly important source of external financing for many countries[2]. Especially for some developing countries these receipts are among the biggest sources of external financing. Remittances to developing countries through official sources reached US$ 221 billion in 2006, double the value of official aid to the developing countries (Adams and Cuecuecha, 2010)[3]. Remittances these days are not only a source of high foreign exchange earnings for developing countries but also a mode to reduce

[1]Assistant Professor at Department of Economics, Hafiz Hayat Campus, University of Gujrat, Gujrat; Assistant Professor at Mirpur University of Science and Technology, Bhimber Campus, Azad Jammu & Kashmir; visiting Lecturer at Hafiz Hayat Campus, University of Gujrat, Gujrat; and MS scholar at UMB School of Business and Economics, Norwegian University of Life Sciences, Norway, respectively.
Corresponding author email: saim.hashmi@uog.edu.pk

[2] The number of migrants around the world increased from around 70 million in 1960 to more than 190 million in 2005 (Ahmed et al., 2010)

[3] Remittances to developing countries exhibited a growth rate of 6.5 percent between 2006 to 2012 (World Bank, 2012)

poverty. Remittance inflows reduce poverty by stimulating incomes of the recipient country, enhancing human development through financing better education and health hence contribute remarkably to the economic uplift of the poor households (Andersson, 2012; Adams and Cuecuecha, 2010; Banga and Sahu, 2010; Cox-Edwards and Rodriguez-Oreggia, 2009; Shroff, 2009; Munir et al., 2007; Qayyum et al., 2007; Koc and Onan, 2001).

Remittances affect poverty levels and household income through two different channels. First, the direct channel in which remittances act like cash transfers and households can directly spend the money on poverty reducing activities. Second, the macro channel in which remittances work as macro stabilizer in the economy by providing the foreign exchange and contributing to the capital formation and increased employment. However, it is also argued that the economy at macro level can also suffer in the form of loss of labor supply in which huge amount of human capital is embedded. This is referred to as "brain drain" hypothesis. Nevertheless, costs associated with brain drain might not be very high due to prevailing high unemployment/underemployment rates and low levels of skill acquisitions in developing countries (Khan, 2008).

There are two major reasons to carry out this study. First, evidence on the relationship between foreign remittances and poverty is inconclusive when studied at the household level. Quite a rich literature suggests that foreign remittances reduce poverty levels in the home country (Andersson, 2012; Adams and Cuecuecha, 2010; Khan, 2008; Jongwanich, 2007; Chukwuone; 2007). Jongwanich (2007) suggests that remittances directly reduce poverty levels in home countries by increasing household income and smoothingconsumption. On the contrary, it is argued that the migration process itself is one of the key determinants of returns to migration and thus its impact on poverty levels. Migration is a very expensive process due to high travel costs (Adams et al., 2003). If the migrants belong to low income segments of the society, the impact of migration on poverty might not be direct and immediate, rather might work with a lag and the intensity might vary with time (Kapur, 2004). Most of the remittances during initial years are spent on repayment of loans acquired for meeting the travel costs associated with migration.

The second reason for carrying out this study corresponds to the lack of sufficient evidence on impact of foreign remittances on poverty at the household level especially for Pakistan. Although a number of studies have

been carried out at the macro level to assess the impact of foreign remittances on poverty levels, the literature on impact assessment of foreign remittances in the case of Pakistan at the household levels is quite scant. Therefore, current study employs a novel methodology and attempts to fill this gap in empirical literature on the relationship between remittances and poverty in Pakistan

A Study of this issue is well suited to the case of Pakistan mainly due to two reasons. First, foreign remittances have become the second biggest source of foreign exchange earnings after exports in Pakistan[4]. Second, this analysis is also suited from public policy perspective. The government of Pakistan has been discussing to issue remittance bonds to attract more remittances from Pakistanis settled abroad. This analysis will also contribute to the discussions regarding the issuance of bonds and might help policy makers in taking a look at the issue from the perspective of poverty alleviation.

Given these theoretical motivations and relevance of the issue to Pakistan's economy, the objective of the current paper is to estimate the impact of foreign remittances on per capita income household poverty in Pakistan. For this purpose, we use Household Integrated Economic Survey of Pakistan (2007-08) data and employ propensity score matching method to estimate the average treatment effect on treated.

The rest of the paper is organized as follows; Section 2 discusses the methodological approach applied in this paper. Section 3 presents data and the basic household characteristics; section 4 discusses empirical evidence while section 5 concludes the paper.

2. Methodology

To evaluate the impact of foreign remittances on Household poverty in Pakistan, we employ Propensity Score Matching (PSM) technique (Rosenbaum and Rubin. 1983, 1985). Receiving remittances is just like receiving a "treatment" and we can estimate an average treatment effect function for probability of being under the poverty line. Therefore, using PSM, we compare the probability of being in poverty situation for remittances receiving households to the households that do not receive remittances. If a statistically significant difference between the two exists, we can attribute it to

[4] By the end of FY 2010-11, Pakistan's total exports stood at US$ 25.3 billion compared to foreign remittances at US$ 8.9 billion. Remittances increased by 10 times during 2000 to 2012 compared to the total exports that merely doubled during this time period.

the presence of remittances. The underlying assumption of this methodology is that although the decision to receive a treatment (receive remittances) is non-random, it can still be attributed to some observable household specific characteristics. Estimation of average treatment effect using observational data can produce biased results when the non-experimental data is used (Esquivel and Pineda, 2006). This is mainly because of non-random assignment of households to treatment and control groups in the presence of confounding factors. We can overcome this problem using PSM technique which constructs a statistical comparison group based on the probability of participating in the program and conditioned on the observable characteristics. (World Bank, 2009).

At the first step, for every household from the treatment group a household with similar characteristics is chosen from the control group. This implies that after controlling for the household specific variables, any difference between the two groups can be associated with the receipt of remittances. Thus the mean effect of paired individuals can be considered as the average treatment effect on treated (ATET). Once the matching is made between two groups then the effect of remittances on the probability of being in poverty is calculated.

The treatment variable D is a binary variable, coded as 1 if the household receives remittances and zero otherwise.

$$ATET = \mathrm{E}\left[\mathrm{Y}(1) - \mathrm{Y}(0) \mid \mathrm{D} = 1\right] = \mathrm{E}\left[\mathrm{Y}(1) \mid \mathrm{D} = 1\right] - \mathrm{E}\left[\mathrm{Y}(0) \mid \mathrm{D} = 1\right]$$

Y is the outcome variable. The second term of the right hand side tells us about how a treated individual would have performed had he not received the treatment. The propensity score index is defined as the probability of receiving treatment conditional on observed covariates $X : P(X) = \Pr(D = 1 \mid X)$.

In matching based scores, outcomes of treated and control groups are compared based on single index P(X) instead of all variables in X. For identification of the program effect, the assumptions of condition independence and common support have to be fulfilled. The average treatment effect in this paper has been estimated using nearest neighbor, Kernel and Radius matching algorithms.

3. Data and Household Characteristics

In this study the official definition of poverty used by government of Pakistan to estimate the food based poverty line has been employed. The poverty line of 2350 calorie per adult per month has been taken. The monetary value to purchase these calories for 2007-08 was Rs.944 per month. We have used data from household integrated economic survey (HIES) 2007-2008 to carry out the analysis. The survey covers 15,512 households from all over the country and contains information on variables like household characteristics, education, region, remittance receivers, individual's income and expenditures. HIES is a national representative survey that draws a representative sample covering all the geographical parts of the country by employing a two stage stratified sample design. It records information on domestic and the international remittances separately. However in this study, data only on international remittances has been used to carry out the analysis. It can be observed from table 1 that about 5 percent of the households in the dataset receives foreign remittances. This percentage is higher at about 6 percent in the rural households compared to 4.6 percent of the households in urban areas.

Table 1: Percentage of households receiving

	Overall	Urban	Rural
Households not receiving	94.64	95.4	94.12
Households receiving	5.36	4.6	5.88
Total	100	100	100

Figure 1 below suggests that poverty seems to be more prevalent in rural areas. Irrespective of the region poverty is less prevalent in households that receive remittances compared to the households that do not receive remittances. Almost 57 percent of the rural households that do not receive remittances fall below the poverty line compared to 29 percent of the urban households that do not receive remittances.

4. Empirical Evidence

Household specific variables used in this analysis for matching purposes include the number of adult females in the household, number of adult family members with primary education, Age of the household head, Age squared, Education level of household head, education squared, gender of the household head, interaction term between the age of household head and his educational attainments, interaction between age squared and the

educational attainments, Dummy variable for households having access to landline phone, Dummy variable for the presence of natural gas connection, Dummy variable for the access to electricity, Dummy variables if the residence of the households is personal property and finally the dummy variable for the household resides in urban area. These dummy variables have been used to pick up the differences in wealth effects while the squared and interaction terms have been employed to model any kind of existing non-linearity.

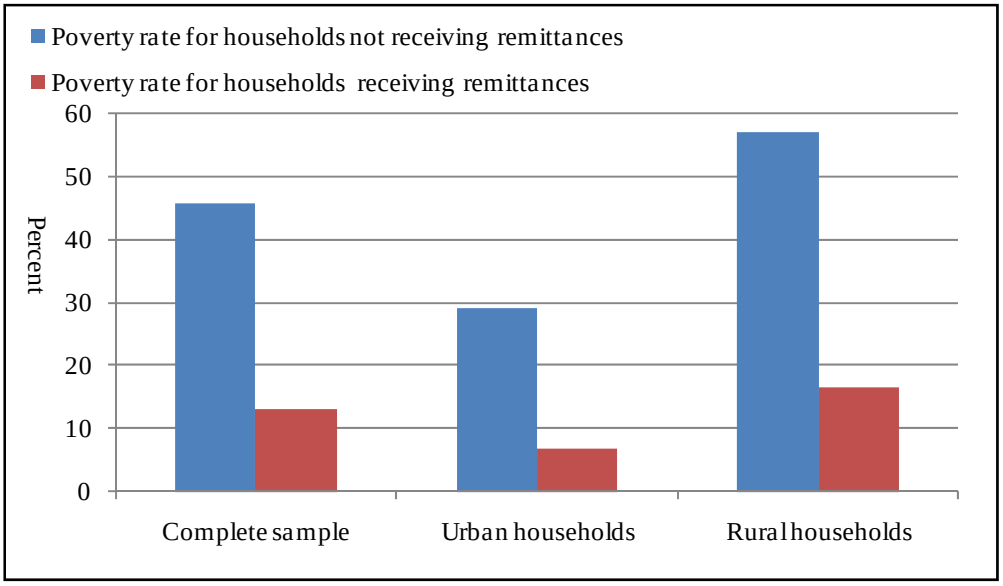

Figure 1: Percentage of households below poverty line viz-a-viz remittances

Table 2 presents the estimates from the probit model which has been employed in our analysis. Almost all the key variables are statistically significant and carry correct sign. The coefficients from this probit model have then been used to compute the propensity score for households to receiveTable 3 presents the results of average treatment effect on treated with different outcome variables under alternative matching techniques. Average treatment effect results for the outcome variables of per capita income and poverty are significant statistically. Per capita income results indicate that remittances increase per capita income across all the households irrespective of the region. For the complete sample, remittances increase the per capita

income by about 45 percent[5] when we compare it to the per capita income of the households that do not receive remittances[6]. This percentage tends to be even higher at 64 percent for the case of urban households. Results have remained robust across all the matching methods and confirm that per capita income increases substantially as a result of increase in remittances.

When we look at poverty as the outcome variables, we find that remittances significantly reduce the probability of households getting under the poverty line. Results have stayed robust under alternative matching methods employed for the analysis. For the complete sample remittances reduce the probability of households getting under the poverty line by 30 percent. This percentage is higher for the rural households at 36 percent compared to the rural households at 23 percent. These estimates for complete sample are in line with the estimates of Khan (2008) for the case of Bangladesh. Khan (2008) finds that the marginal probability of getting under the poverty line decreases by 20 percent if a household receives foreign remittances. Impact of remittances on the per-capita incomes of the households between rural and urban areas appears symmetric, however; probability of households getting out of poverty line is higher for the case of rural households than the urban households. This pattern is explained if we look at the household expenditures on the consumption of basic necessities of life. Households in the rural areas spend more of their income on food and clothing compared to their urban counter parts. Rural households spend about 49 percent of their incomes on food items compared to the urban households who are left with about 38 percent of their incomes to be spent on food items. Even in the case of housing, clothing, transportation, recreation and education, rural households allocate less of their budget share than the urban households[7]. This implies that the difference in the cost of living between rural and the urban areas and rural household's propensity to spend more money to their basic needs enhances their ability to get out of the poverty situation.

[5] We obtain this number by calculating the treatment effect amount as a percentage of per capita income of households that do not receive foreign remittances.

[6] We have used Kernel matching method for these calculations. For interpretational purposes we prefer Kernel matching method over other methods because Kernel matching uses weighted average of all non-participants to construct match with the participants whereas other methods use only a small set of non-participants for carrying out the comparison.

[7] For details see Pakistan Bureau of Statistics (2008), pp. 8

Table 2: Probit Estimates
Dependent Variable: Dummy variable for households receiving remittances

	Complete sample		Urban Households		Rural Households	
	Coefficient	Std. Err.	Coefficie	Std. Err.	Coefficie	Std. Err.
Age of household head	0.0025	0.0074	0.0003	0.0131	-0.0018	0.0090
Education level of household head	0.0388	0.0199	0.0763	0.0365	0.0107	0.0240
Gender of household head	0.0732	0.0413	0.0646	0.0667	0.0957	0.0509
Age squared	-7.23E-06	7.97E-	-6.98E-05	0.0002	0.0001	0.0001
Education squared	-0.0018	0.0009	-0.0048	0.0017	0.0003	0.0011
	3.05E-06	3.56E-	9.52E-06	6.37E-	-1.37E-06	4.53E-06
Age* Education level of household head	-0.0005	0.0001	-0.0005	0.0002	-0.0004	0.0001
No. of adult females in household	0.2013	0.0096	0.2188	0.0151	0.1884	0.0126
No. of adult family members with primary	-0.0891	0.0200	-0.1076	0.0346	-0.0842	0.0248
Dummy for landline phone connection	0.4666	0.0408	0.3455	0.0627	0.5726	0.0534
Dummy for gas connection	-0.1192	0.0516	-0.1169	0.0660	-0.0942	0.0815
Dummy for electricity connection	0.5519	0.0846	0.4333	0.3958	0.5390	0.0872
Dummy if the residence is a personal	0.1778	0.0629	0.1233	0.0782	0.2667	0.1083
Dummy for rural/urban area	0.2329	0.0491				
Constant	-3.5266	0.2483	-3.0577	0.5471	-3.0053	0.2812
Pseudo R^2	0.1246		0.1308		0.1228	

Table 3: Average treatment effects of foreign remittances under alternative matching

Outcome variable: Per capita income

	Nearest Neighbor		Kernel		Radius	
	ATT	Std. Err.	ATT	Std. Err.	ATT	Std. Err.
Complete sample	5665.564	1512.119	6965.432	870.036	7432.712	1225.866
Urban households	8702.175	2851.808	7706.225	2990.074	5192.109	2936.533
Rural households	4842.265	1392.006	7827.305	935.508	5273.251	1824.345

Outcome Variable: Poverty

	Nearest Neighbor		Kernel		Radius	
	ATT	Std. Err.	ATT	Std. Err.	ATT	Std. Err.
Complete sample	-0.278	0.024	-0.30	0.016	-0.29	0.022
Urban households	-0.23	0.037	-0.23	0.021	-0.20	0.031
Rural households	-0.37	0.031	-0.36	0.017	-0.35	0.028

4. Concluding Remarks

In this paper we evaluate the impact of foreign remittances on household poverty in Pakistan using Household Integrated Economic Survey of Pakistan (HIES) data for 2007-08. Propensity score matching (PSM) method was used to estimate average treatment effect on treated for the impact assessment of foreign remittances on per capita income and poverty levels in Pakistan.

Average treatment effect estimates suggest that remittances increase the per capita income by about 45 percent when we compare it to the per capita income of the households that do not receive remittances. This percentage is even higher at 64 percent for the case of urban households.

Average treatment effects on poverty estimates suggest that for the complete sample, remittances reduce the probability of households getting under the poverty line by 30 percent. This percentage is higher for the rural households at 36 percent compared to the rural households at 23 percent.

Our impact assessment results conclude that keeping other factors constant, remittances increase the per capita income and reduce the poverty of the households not only for complete sample but also for the households from the rural and urban areas separately. Government should facilitate expatriate Pakistanis in sending remittances to their home country. Issuance of Remittance bonds seems to be a step in the right direction. Increase in remittances will not only help in achieving macroeconomic stability, but also support the government initiatives in reducing poverty levels.

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