Do Migrant Remittances Reduce Poverty?
Micro-Level Evidence from Punjab, Pakistan

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Abstract: This paper provides a poverty profile of households and then investigates the effects of international remittances on poverty incidence and severity in Punjab, Pakistan. Using cross-section data from the latest *Multiple Indicator Cluster Survey* for Punjab, the disaggregated analysis on the remittance-poverty nexus is examined by districts and urban-rural locales. From the poverty profile for migrant households with remittances and the counterfactual scenario of no remittances, the differences in the poverty reduction effect seem larger for poverty headcount than on the depth of poverty. The same trend holds for the urban-rural locales. This implies that remittances inflow were not really helpful for the poorest of the poor. The regression analysis further reveals that migrant remittances have significantly reduced the level and depth of poverty for households in all districts of Punjab, with the highest probability of being non-poor for rural households in the districts of South Punjab.

Keywords: Migrant households, Pakistan, poverty, Punjab, remittances
JEL classification: F24, I32, I39

1. Introduction

Migrant remittances are an important part of the Pakistan households (HHs). Hence, a flurry of papers has focused on evaluating the level, depth and severity of poverty with remittances inflow, at the national and sub-national provincial levels for Pakistan (Cheema, 2005; Jafri, 1999; Mughal & Anwar, 2012; Qureshi & Arif, 2001; Siddiqui & Kemal, 2006). In doing so, however, there are only a few studies, like Ali (2011), Arif and Farooq (2014), Arif and Nazim (2012), Cheema, Khalid and Patnam (2008), Gazdar (1999), Jamal (2003), Jamal (2007), Malik (2005) and Wilder (1999), which examine this relationship at the district-level. More importantly, the urban-rural analysis in the intra-district context remains limited (Adams, 1996; Iqbal, 2013). Data constraints explain the limited studies related to the geography of poverty at a disaggregated level.

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District-level[1] and urban-rural poverty analyses for migrant HHs[2] in Pakistan are important for the following reason. There is substantial HH inequality between and within districts (urban-rural). Further, the Pakistan economy is bifurcated into distinct rural and urban locales, with observed disparities in poverty between the two (Planning Commission of Pakistan, 2014). The rural economy hosts a larger population and is agriculture-based, while the urban economy is associated with industrial and service sectors. A micro-level analysis is therefore important as it may reveal useful insights from the varying impacts of remittances for migrant HHs. Following which, the contributions of the paper to the literature on the relationship between remittances and poverty are twofold. First, the paper examines the remittance-poverty nexus for migrant HHs at the disaggregated sub-national level, namely district-level (Punjab[3]), and also compares the relationship within districts (urban-rural locales). Second, we use several measures of poverty[4] that makes it possible to investigate the robustness of the effects of remittances on different measures of poverty.

The rest of the paper is organised as follows. Section 2 reviews the literature on remittances and poverty. Section 3 describes the data and details the methodology. Section 4 provides a poverty profile for Punjab and its districts to set the background of the study. Section 5 reports and discusses the empirical findings on the impact of foreign remittances on the incidence and severity of poverty. Section 6 concludes.

2. Literature Review

From a theoretical perspective, the poverty effects of remittances on migrant HHs and sending locales can be placed between two possible ends (de Haas, 2005; Taylor, Armitage, & Poston, 2005). One extreme of the spectrum structures the "optimistic" state in which migration lessens poverty in migrant-source communities by increasing the earnings of HHs and improving their well-being. The other end defines a "pessimistic" scenario where poor HHs that lack money face risks as emigration involves high entry costs. If emigration is expensive and risky, the middle or upper income would be the persons to emigrate since it will become unaffordable for HHs from the poorest segments.

The empirical literature however supports the optimistic scenario of poverty reducing impacts of remittances in home country communities. The findings for many country-based studies appear to demonstrate that remittances positively affect the income of the people and HHs (Adams, 1989; 2006; Adams & Page, 2003; 2005; Barham & Boucher, 1998; Miambo & Ratha, 2005; Rodriguez, 1998; World Bank, 2006; Yang

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[1] The "*district*" is the third level of the administrative unit in Pakistan and is a subdivision of the province. Pakistan contains 132 districts, of which 36 fall within Punjab. Central Punjab comprises 15 districts, while the South and North Punjab consist of 11 and 10 districts, respectively.

[2] A HH that receives money from at least one migrant working abroad.

[3] Punjab is the largest province of Pakistan with 36 districts. It can be divided into 3 locales: Central (15 districts), North (11 districts), and South (10 districts).

[4] The new poverty line for Pakistan, PKR. 3030/adult/month, was recently announced by the Finance Minister ("New poverty line", 8 April 2016). It is computed for individuals, then rescaled to the HH level using the OECD-modified equivalence scale.

& Martinez, 2005). The estimated impact varies from country to country. In some instances, however, it was observed that remittances do not adequately counterbalance the losses from emigration (Acosta, Fajnzylber, & Lopez, 2007). In these cases, remittances hamper development by keeping HHs at their pre-migration income levels, while reducing their labour supply. The situation under which migration happens is thus crucial in determining the poverty impacts.

Migrant remittances are usually considered as a direct private financial support for the HH; it serves as a key source of finance to augment income and smooth consumption for the vulnerable poor (Quartey, 2005). Apart from smoothing consumption patterns, Chimhowu, Piesse and Pinder (2003) discuss other indirect channels through which remittances can reduce poverty. At the HH level, migrant remittances provide better food intake, improve access to health services, improve education levels and reduce child labour. With imperfect rural credit and labour markets in developing economies, remittances also provide HHs with the resources required to innovate or cover the full costs of agricultural production (for purchasing seed and inputs, and machinery equipment), which otherwise would not be possible. At the community level, remittances inflow improve local infrastructure, which then leads to the development of the local goods markets and growth of new services. This generates local employment and leads to a reduction in poverty.

Growing evidence from HH survey data support that international remittances have reduced the incidence and severity of poverty in several low-income countries (Adams, 2004; 2006; Beyene, 2014; Chukwuone, 2007; Durand, Parrado & Massey, 1996; Esquivel & Pineda, 2006; Funkhouser, 2006; Gustafsson & Makonnen, 1993; Jones, 1998; Rapoport & Docquier, 2006; Russell, 1986; Taylor, 2006; Taylor et al., 1996; Taylor et al., 2005; UNCTAD, 2011). Specifically, Gustafsson and Makonnen (1993) found international remittances to have more impact on reducing the depth of poverty than on the poverty headcount; in other words, they were really helpful for the poorest of the poor (World Bank, 2006).

Related studies that have examined remittances on urban and rural poverty include Adams (1991), Drèze and Sen (1989), Lachaud (1999), Lucas and Stark (1985) and Stark and Lucas (1988). The results by Lachaud (1999) suggested that remittances lower rural poverty more than urban poverty. Yet, the ratio of poverty reduction was found to be significant for subsistence farmers only and the inactive in rural locales, and for more susceptible socio-economic groups (unemployed and/or self-employed) of urban areas.

3. Data and Methodology

3.1 Data Description

The data is sourced from the latest *Multiple Indicator Cluster Survey* (BOS, 2015; BOS & UNICEF, 2016). The survey was conducted by the Bureau of Statistics, Planning & Development Department, Government of Punjab in collaboration with the United Nations Children's Fund (UNICEF). The survey covered all the 36 districts of Punjab, with 2,050 clusters and approximately 20 HHs in each cluster, giving a sample of 41,413 HHs. MICS data is used for this paper as it comprises important social, economic and

demographic related information. The survey information is divided into four parts: child related, women related, HH members' education status and HH characteristics related data. After dropping the HHs with incomplete data, a total of 36,400 HHs are available for the analysis. Some information is made available at the individual level, for instance the education level. We compile them at the HH level, and then by district and urban-rural locales. Finally, we arrange the dataset for each district by migrant HHs and non-migrant HHs. For the former group, we obtain 2,891 (7.9 percent) HHs by re-filtering the data and applying the geometric mean technique.

3.2 Model Specification

Combining the existing literature on poverty, like Adams (2006), Andersson, Engvall and Kokko (2006), Beyene (2014), Phangaphanga (2013) and Taylor (2006), we draw upon some determinants of poverty for the empirical investigation, including remittances as one of the explanatory variables. The specification is as follows:

$$Pov_i = \beta_0 + \beta_1 RI_i + \beta_2 Dep_i + \beta_3 HS_i + \beta_4 HHedu_i + \beta_5 HHage_i + \beta_6 MHH_i + \beta_7 HHMS_i + e_i \tag{1}$$

The subscript i represents each HH, and e is an error term.

where
Pov = poverty
RI = migrant remittances
Dep = dependency
HS = household size
$HHedu$ = education level of HH head
$HHage$ = age of HH head
MHH = male HH head
$HHMS$ = marital status of HH head

The extent of HH poverty (*Pov*) is calculated based on the Foster-Greer-Thorbecke (FGT) class of poverty measures, which include the head count ratio[5] (HCR), poverty gap[6] (PG) and the poverty gap squared[7] (PGS, also known as the poverty severity index). The HCR and the PGS measures are used interchangeably as the dependent variable in equation (1) to proxy the incidence of poverty and the severity of poverty, respectively. Remittance inflow (*RI*) is the core variable in the model. It measures the amount received by migrant HHs during the previous year. It is expected to reduce the incidence and severity of poverty. The other independent variables are described in Table 1 and explained below.

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[5]   The HCR refers to the proportion of the population that is below the poverty line.
[6]   The PG takes the difference between poor HHs' expenditure/income and the poverty line. For everyone else the gap is accounted to become zero. Mainly, it shows how much would have to be given to HHs below the poverty line to bring their income/expenditure up to the poverty line. It can be considered the minimum cost for eliminating poverty.
[7]   The PGS averages the squares of the poverty gaps relative to the poverty line and gives more weight to the individuals that are significantly far from the poverty line.

Table 1. Description of variables

Variable	Description	Measure
Pov	Incidence of poverty / Severity of poverty	Measured as HCR for incidence of poverty, and PGS for severity of poverty
RI	Foreign remittances inflow	Binary variable 1 for remittance receivers, 0 for non-receivers
Dep	Dependency	Number of HH members that are below 14 years of age and above 64 years
HS	Household size	Number of persons of a family, residing together
HHedu	Education level of HH head	Measured as none, primary, middle, secondary and higher level
HHage	Age of HH head	Number of years
MHH	Male HH head	Binary variable 1 for male, 0 for female
HHMS	Marital status of HH head	Binary variable 1 for married, 0 for widowed and single-headed HHs

Two control variables for HH characteristics in equation (1) are dependency (*Dep*) and household size (*HS*). According to the World Bank's (2010) classification, persons below the age of 14 years and above 64 years are not productive, and therefore considered as dependents. The growing number of dependent members increases HH expenses and reduces their per capita earnings, resulting in higher poverty (Adams & He, 1995; Arif & Farooq, 2014; Farah, 2015; Hashmi & Sial, 2005; Lipton, 1983; McCulloch & Baulch, 2000; Sen, 2003; Zhang, Guariglia, & Dickinson, 2015). The *HS* factor includes the number of HH members residing together. While *Dep* is expected to be positively related with poverty, the sign for *HS* may be negative or positive, depending upon the numbers of employed members in the HH.

The other group of controls refer to the head of the HH, who is supposed to take on a decision-making role in spending and investment patterns. There are four variables that relate to the head of the HH – education, age, gender and marital status. An educated HH head can be easily employed with higher earnings and make better decisions on spending; this in turn reduces poverty (Arif, 2000; Bilenkisia, Gungorb, & Tapsinc, 2015; Hashmi & Sial, 2005; Maitra & Vahid, 2006; Mughal & Diawara 2010; Myftaraj, Zyka, & Bici, 2014; Okojie, 2002; World Bank, 1995; 1998; Yadollahi, Paim & Taboli, 2013). Likewise, older heads of HHs are experienced and are able to improve the economic well-being of their families (Ahmad, Guntur, & Shikha, 2010; Taylor, Fry, Cohn & Livingston, 2011; Verner, 2006). Male HH heads also play a more active role in earning-related activities as they are considered physically stronger than women for difficult jobs related to farming, mechanical work, plumbing and masonry (Azevedo et al., 2007; Farah, 2015; Myftaraj et al., 2014; Snyder, McLaughlin & Findeis, 2006; Yadollahi et al., 2013). In Punjab, married members of the HH are further considered responsible for meeting the financial needs of the family (Ali, Zafar & Hussain, 2005; Hussian, 2012).

Analysing the poverty impacts of remittances involve some empirical challenges. One is how remittances are compared to income from other sources (non-remittance income). This study treats remittances as an exogenous source of income. The approach taken therefore is to simply look at poverty with remittances, and a counterfactual scenario of without remittances (see Gustafsson & Makonnen, 1993; Taylor et al., 2005).

For examining the determinants of the incidence of poverty (HCR), the logit technique is employed. However for the determinants of the severity of poverty based on the PGS index, the instrumental variable (two-stage least squares, 2SLS[8]) approach for examining regressions is used. This is because the PGS index is not a dichotomous variable, and has unique values for each district. Propensity score matching (PSM) is also used to compare the severity of poverty of migrant HHs and non-migrant HHs (Rosenbaum & Rubin, 1983), by matching the comparable characteristics (number of dependents, male HH head, education level of HH head and residing location of HH) of both groups.

4. Poverty Profile of Punjab

Poverty is measured for all HHs, and the sub-group of migrant HHs. For migrant HHs, poverty is measured in two scenarios: with the inclusion of foreign remittances in total earnings and in the absence of these funds. The poverty incidence and severity is also measured at the urban-rural level to capture differences across locales.

Table 2 reports the incidence and severity of poverty at the provincial level. On average, almost one out of four HHs in the Punjab province is likely to be poor. The HCR measure shows that the incidence of poverty in the rural areas is higher than the provincial average and is more than twofold that of the urban locales. Approximately 15 percent of urban HHs are below the poverty line, which is less than half of the poor HHs in the rural areas. Similar to the HCR, the PG is also lower in urban relative to rural areas, suggesting that it is easier to lift the former out of poverty. For instance, the poverty gap of urban areas is estimated to be around 6 percent, indicating that the poor HHs needed an additional 6 percent of their current earnings to get the required minimum basic needs, while in the rural areas, they needed 14 percent for the same.

Table 2. Provincial poverty incidence, 2014

Punjab Province			Urban			Rural		
HCR	PG	PGS	HCR	PG	PGS	HCR	PG	PGS
0.2625	0.1115	0.0689	0.1458	0.0594	0.0385	0.3210	0.1376	0.0842

Note: HCR – Headcount ratio, PG – Poverty gap, PGS – Poverty gap squared.
Source: Calculated from *MICS, 2014* (Bureau of Statistics Punjab & UNICEF Punjab, 2016).

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[8] We use two types of tests to assure the goodness-of-fit of the model, the Pearson χ^2 and the Hosmer-Lemeshow test. The null hypothesis has been rejected for all districts based on both tests, implying that the chosen model is correctly specified. The instrument is also valid as the first stage F-statistic and eigenvalue statistic are both significantly higher than the 2SLS size of nominal Wald test.

The PGS index again reveals that the severity of poverty in the rural area is more than two-fold that of the urban.

The higher incidence and severity of poverty in the rural relative to the urban areas is directly associated with the agriculture sector, apart from the low literacy rate, poor job opportunities and low wages in rural areas. In the context of the agriculture sector, the earnings of farmers are subject to the volatile prices of intermediate inputs and crop prices, interrupted electricity supply, unfavourable weather and natural disasters. The agriculture sector also experiences unstable earnings due to inequities in the distribution of land and fragmentation of landholding. Landless HHs (more than 50 percent of farmers do not own the land) have to access non-farm sector for their survival (Arif & Farooq, 2014), while land fragmentation reduces the availability of adequate land area needed for sufficient and sustainable income (Hussain, 2004).

Table 3 reports the FGT poverty measures by districts in Punjab. More than 50 percent of the districts in Punjab have poverty levels that are higher than the overall provincial level. In terms of the poverty incidence, the districts of South Punjab like Rajanpur, Bhakkar, Muzaffargarh, Bahawalpur and DG Khan are worse off than other districts of the province. For example, in Rajanpur, every second person is surviving below the poverty line. South Punjab relies heavily on agriculture, with low yield that is linked to problems of poor irrigation (Khawaja, 2012), low rainfall and poor connectivity, resulting in lack of supply chain linkages with the food and dairy processing sector ("Origins of poverty", 2 August 2010). Central Punjab is found to be relatively more prosperous than the South and North regions, particularly districts like Gujranwala and Sialkot. These are also districts with literacy rates of more than 65 percent (BOS, 2015), heavily industrialiszed with major trading activities, and rural areas with small cultivable lands that are well irrigated, resulting in high yields.

Further, South Punjab districts also show more variation in poverty within districts. For instance, Rajanpur, the poorest rural district in Punjab, ranks 9th in the urban ranking. Similarly, Layyah ranks 4th and 16th, Bahawalpur 11th and 3rd, and DG Khan 3rd and 12th for the rural and urban provincial rankings, respectively. The trends in the severity of poverty largely reflect the findings on the incidence of poverty. The severity of poverty is again noted mainly for districts in South Punjab.

The poverty levels are also compared within migrant HHs under two income scenarios, without remittances (based solely on other sources of income, *OI*) and with remittance income (in addition to *OI*). The results for Punjab (overall, urban and rural) and by districts are reported in Tables 4 and 5, respectively. From Table 4, it is clear that remittances have drastically changed the poverty level of migrant HHs; it lowered the poverty incidence, gap and severity by 38 percent, 30 percent and 28 percent, respectively. The same can be said for urban and rural migrant HHs.

From Table 5, remittances bring about more than 30 percent reduction in the incidence of poverty (HCR) among migrant HHs in 75 percent of the districts. Likewise, more than 30 percent of the migrant HHs were lifted out of extreme poverty (PG) and severity of poverty (PGS) in 42 percent and 28 percent of the districts, respectively. The largest differences in the HCR (and PG) in migrant HHs with and without remittances is observed for districts Attock and Chakwal at 55 percent each (42 percent and 41 percent respectively), and Narowal at 54 percent (38 percent). DG Khan and Layyah

Table 3. District-wise poverty level for Punjab, by urban-rural locales, 2014

District	Punjab Province				Zone	Urban				Rural			
	HCR	PG	PGS	Rank		HCR	PG	PGS	Rank	HCR	PG	PGS	Rank
Rajanpur	0.4935	0.2204	0.1301	1	South	0.2199	0.0920	0.0537	9	0.5399	0.2422	0.1431	1
Bhakkar	0.4713	0.2235	0.1400	2	South	0.3112	0.1209	0.0686	1	0.5017	0.2429	0.1535	2
Muzaffargarh	0.4351	0.1938	0.1232	3	South	0.2999	0.1223	0.0756	2	0.4607	0.2074	0.1322	5
DG Khan	0.4297	0.2057	0.1319	4	South	0.2050	0.0877	0.0564	12	0.4818	0.2330	0.1494	3
Layyah	0.4273	0.1886	0.1155	5	South	0.1885	0.0690	0.0408	16	0.4696	0.2098	0.1287	4
Pakpattan	0.3569	0.1556	0.0950	6	Central	0.2331	0.1054	0.0748	5	0.3793	0.1647	0.0986	10
Bahawalnagar	0.3532	0.1399	0.0782	7	South	0.2196	0.0800	0.0445	10	0.3846	0.1540	0.0861	9
Sahiwal	0.3527	0.1522	0.0921	8	Central	0.1374	0.0611	0.0392	28	0.3975	0.1712	0.1031	7
Khushab	0.3514	0.1679	0.1073	9	North	0.2041	0.0651	0.0335	13	0.4083	0.2077	0.1358	6
Mianwali	0.3417	0.1590	0.1004	10	North	0.2375	0.0840	0.0457	4	0.3661	0.1766	0.1133	14
Bahawalpur	0.3327	0.1281	0.0713	11	South	0.2396	0.0923	0.0532	3	0.3735	0.1438	0.0793	11
Sargodha	0.3317	0.1515	0.0963	12	North	0.2073	0.0934	0.0610	11	0.3913	0.1793	0.1132	8
Rahim Yar Khan	0.3298	0.1181	0.0621	13	South	0.1932	0.0733	0.0426	15	0.3661	0.1300	0.0673	13
Okara	0.3244	0.1407	0.0881	14	Central	0.1845	0.0663	0.0426	17	0.3720	0.1660	0.1035	12
Kasur	0.2938	0.1271	0.0784	15	Central	0.1819	0.0713	0.0470	18	0.3422	0.1512	0.0920	15
Attock	0.2836	0.1338	0.0911	16	North	0.2284	0.0993	0.0669	6	0.3025	0.1456	0.0994	16
Lodhran	0.2797	0.0983	0.0511	17	South	0.2270	0.0872	0.0505	7	0.2889	0.1003	0.0512	21
Jhang	0.2727	0.1021	0.0542	18	Central	0.1975	0.0699	0.0361	14	0.2921	0.1104	0.0589	19
Narowal	0.2697	0.1389	0.1040	19	Central	0.1570	0.0966	0.0833	24	0.2895	0.1463	0.1076	20
Nankana Sahib	0.2686	0.1146	0.0717	20	Central	0.1671	0.0788	0.0539	22	0.3012	0.1261	0.0775	17
Hafizabad	0.2640	0.1222	0.0770	21	Central	0.2266	0.0956	0.0622	8	0.2781	0.1321	0.0826	23
Mandi Bahaudin	0.2620	0.1113	0.0691	22	North	0.1703	0.0715	0.0476	21	0.2788	0.1186	0.0730	21
Chakwal	0.2539	0.1210	0.0839	23	North	0.1270	0.0520	0.0351	29	0.2729	0.1313	0.0913	29
Khanewal	0.2496	0.0866	0.0474	24	South	0.1729	0.0619	0.0363	20	0.2667	0.0921	0.0498	20
Chiniot	0.2475	0.0972	0.0541	25	Central	0.1795	0.0646	0.0334	19	0.2769	0.1113	0.0631	19
Vehari	0.2443	0.0799	0.0414	26	South	0.1515	0.0497	0.0315	26	0.2628	0.0859	0.0433	26
Multan	0.2399	0.0965	0.0578	27	South	0.1411	0.0582	0.0373	27	0.2976	0.1188	0.0698	27

Table 3. Continued

District	Punjab Province					Urban				Rural			
	HCR	PG	PGS	Rank	Zone	HCR	PG	PGS	Rank	HCR	PG	PGS	Rank
Sheikhupura	0.2297	0.0987	0.0624	28	Central	0.1528	0.0662	0.0442	25	0.2740	0.1175	0.0729	25
Jhelum	0.2109	0.0881	0.0565	29	North	0.1656	0.0682	0.0494	23	0.2267	0.0950	0.0589	23
Toba Tek Singh	0.1986	0.0678	0.0346	30	Central	0.1257	0.0434	0.0231	30	0.2200	0.0750	0.0379	30
Faisalabad	0.1942	0.0771	0.0454	31	Central	0.1175	0.0453	0.0281	31	0.2650	0.1065	0.0613	31
Gujrat	0.1928	0.1105	0.0882	32	North	0.0800	0.0408	0.0321	36	0.2312	0.1341	0.1073	36
Rawalpindi	0.1755	0.0872	0.0620	33	North	0.1043	0.0528	0.0394	34	0.2596	0.1279	0.0887	34
Gujranwala	0.1345	0.0504	0.0308	34	Central	0.0966	0.0330	0.0190	35	0.1764	0.0696	0.0438	35
Sialkot	0.1282	0.0581	0.0398	35	Central	0.1053	0.0579	0.0478	33	0.1370	0.0581	0.0367	33
Lahore	0.1254	0.0522	0.0351	36	Central	0.1069	0.0430	0.0293	32	0.2055	0.0921	0.0602	32

Note: HCR – Headcount ratio, PG – Poverty gap, and PGS – Poverty gap square.
Source: Calculated based on *MICS, 2014* (Bureau of Statistics Punjab & UNICEF Punjab, 2016).

Table 4. Differences in poverty within migrant HHs, provincial level

	Income without remittances (OI)			Income with remittances (RI + OI)		
	HCR	PG	PGS	HCR	PG	PGS
Overall						
	0.4590	0.3373	0.2989	0.0782	0.0328	0.0196
Urban						
	0.4114	0.3332	0.3109	0.0389	0.0181	0.0116
Rural						
	0.4822	0.3394	0.2930	0.0974	0.0399	0.0236

Note: OI – other income, RI – migrant remittances, HCR – Headcount ratio, PG – Poverty gap, PGS – Poverty gap squared.
Source: Calculated from *MICS, 2014* (Bureau of Statistics Punjab & UNICEF Punjab, 2016).

Table 5. Differences in poverty within migrant HHs, district level

No.	District	Income without remittances (OI)			Income with remittances (RI+OI)			Difference		
		HCR	PG	PGS	HCR	PG	PGS	HCR	PG	PGS
1	Bahawalpur	0.4284	0.2625	0.2217	0.1295	0.0445	0.0213	0.2990	0.2180	0.2005
2	Bahawalnagar	0.4092	0.2421	0.2090	0.0733	0.0666	0.0605	0.3358	0.1755	0.1485
3	Rahim Yar Khan	0.2844	0.2148	0.1848	0.1174	0.0654	0.0422	0.1669	0.1494	0.1426
4	DG Khan	0.7242	0.5620	0.4973	0.3727	0.1599	0.0975	0.3516	0.4021	0.3998
5	Layyah	0.4972	0.4319	0.4014	0.1091	0.0191	0.0088	0.3881	0.4128	0.3926
6	Muzaffargarh	0.5434	0.4143	0.3604	0.1985	0.0644	0.0303	0.3449	0.3499	0.3300
7	Rajanpur	0.4947	0.3380	0.3053	0.1816	0.0537	0.0265	0.3131	0.2843	0.2788
8	Faisalabad	0.4552	0.3408	0.3047	0.0626	0.0278	0.0164	0.3926	0.3130	0.2884
9	Chiniot	0.3988	0.2591	0.2192	0.0396	0.0140	0.0049	0.3591	0.2451	0.2143
10	Jhang	0.2002	0.1412	0.1183	0.0545	0.0059	0.0006	0.1456	0.1353	0.1176
11	Toba Tek Singh	0.3475	0.2172	0.1785	0.0579	0.0142	0.0059	0.2896	0.2030	0.1726
12	Gujranwala	0.4231	0.3121	0.2832	0.0280	0.0120	0.0071	0.3952	0.3001	0.2762
13	Gujrat	0.4697	0.3578	0.3187	0.0179	0.0071	0.0049	0.4519	0.3507	0.3139
14	Hafizabad	0.5256	0.3524	0.3001	0.0780	0.0264	0.0103	0.4476	0.3260	0.2898
15	Mandi Bahaudin	0.4550	0.2718	0.2114	0.0707	0.0334	0.0203	0.3843	0.2384	0.1912
16	Narowal	0.5518	0.3830	0.3380	0.0253	0.0059	0.0017	0.5265	0.3771	0.3364
17	Sialkot	0.4498	0.3492	0.3158	0.0603	0.0144	0.0053	0.3895	0.3348	0.3105
18	Lahore	0.3526	0.3148	0.3054	0.0409	0.0288	0.0216	0.3117	0.2860	0.2839
19	Kasur	0.2281	0.1011	0.0806	0.0000	0.0000	0.0000	0.2281	0.1011	0.0806
20	Nankana Sahib	0.3488	0.2645	0.2452	0.0175	0.0045	0.0012	0.3313	0.2600	0.2441
21	Sheikhupura	0.4146	0.2930	0.2584	0.1047	0.0400	0.0215	0.3099	0.2530	0.2370
22	Multan	0.6009	0.3759	0.3138	0.1270	0.0520	0.0348	0.4739	0.3239	0.2790
23	Khanewal	0.4120	0.2422	0.2039	0.0494	0.0129	0.0048	0.3626	0.2293	0.1991
24	Lodhran	0.5823	0.3150	0.2516	0.1491	0.0897	0.0672	0.4332	0.2252	0.1844
25	Vehari	0.3881	0.2620	0.2171	0.0916	0.0283	0.0132	0.2965	0.2336	0.2039

Table 5. Continued

No.	District	Income without remittances (OI)			Income with remittances (RI+OI)			Difference		
		HCR	PG	PGS	HCR	PG	PGS	HCR	PG	PGS
26	Rawalpindi	0.5067	0.3895	0.3491	0.1152	0.0490	0.0289	0.3916	0.3405	0.3202
27	Attock	0.6112	0.4493	0.4074	0.0579	0.0245	0.0147	0.5534	0.4249	0.3928
28	Chakwal	0.6333	0.4542	0.3894	0.0842	0.0457	0.0321	0.5492	0.4085	0.3573
29	Jhelum	0.4924	0.3661	0.3267	0.0453	0.0210	0.0111	0.4471	0.3452	0.3156
30	Sahiwal	0.4028	0.2912	0.2534	0.0565	0.0236	0.0141	0.3463	0.2676	0.2394
31	Okara	0.3262	0.2857	0.2715	0.0909	0.0662	0.0492	0.2353	0.2195	0.2223
32	Pakpattan	0.5055	0.3144	0.2401	0.0581	0.0023	0.0001	0.4474	0.3121	0.2401
33	Sargodha	0.3375	0.2224	0.1821	0.0874	0.0503	0.0337	0.2501	0.1721	0.1484
34	Bhakkar	0.4684	0.3120	0.2163	0.2655	0.0600	0.0182	0.2029	0.2520	0.1981
35	Khushab	0.4145	0.2592	0.2225	0.0895	0.0584	0.0443	0.3250	0.2008	0.1783
36	Mianwali	0.3688	0.2351	0.2027	0.000	0.0000	0.0000	0.3688	0.2351	0.2027

Note: OI – other income, RI – migrant remittances, HCR – Headcount ratio, PG – Poverty gap, PGS – Poverty gap squared.
Source: Calculated from *MICS, 2014* (Bureau of Statistics Punjab & UNICEF Punjab, 2016).

experienced the largest reduction based on the PGS at 39 percent. Unlike other districts, migrant HHs in DG Khan and Layyah benefited more from the reduction in severity of poverty relative to the incidence of poverty with remittance income. Alternatively, the differences in the "remittance-reduction" effect on the incidence, poverty gap and severity of poverty is lowest for Jhang.

5. Empirical Results

5.1 Remittances and District-Wise Poverty

Table 6 presents the logit regression results[9] of the incidence of poverty across the districts of Punjab. The results reveal that remittances have a highly significant negative impact on the incidence of poverty. In fact, the marginal effect of remittances, ranging from 0.0726 to 0.3224, is significantly higher than other determinants of poverty. For district Attock, the marginal effect of remittances suggests that the probability to be poor is 0.1711 lower for migrant HHs than for non-migrant HHs. Further, the findings indicate that the highest probability of HHs to be non-poor due to remittances are those located in the South, such as Rajanpur (32 percent less than non-migrant HHs), Muzaffargarh (32 percent) and Bahawalnagar (31 percent). The HHs in these districts depend largely on remittances because their agro earnings are low. For instance, in Bahawalnagar, the cultivable area is limited to only 25 percent of the total geographic area. Further the land size per farm is also small, 18 percent of farm size is below 0.5 hectares and 56 percent is 2 hectares (BOS, 2015). Alternatively, the least probability of migrant HHs to be non-poor are two Northern districts, Lahore (7 percent) and Sialkot (11 percent), and Multan (12 percent) from the South.

Although the estimated impact of remittances on poverty varies from district to district, the probability of being poor among migrant HHs is significantly lower than for the non-migrant HHs in all districts of Punjab. These results are consistent with previous studies (Acosta, Calderon, Fajnzylber & Lopez, 2008; Adams 2004, 2006; Gustafsson & Makonnen, 1993; Koç & Onan 2004).

The number of dependents has a positive and significant association with the incidence of poverty in all districts. In districts such as DG Khan and Jhelum, the addition of a dependent member increases the probability of the HH being poor on average by 5 and 4 percent, respectively. The lowest probability values were observed in districts Gujrat and Hafizabad. On the contrary, the probability of being poor due to growing household size is found to be lower in developed districts, such as Faisalabad, Gujranwala, Sheikhupura, Kasur, Lahore and Multan. Alternatively, a larger household size leads to higher poverty in the least developed districts that offer less employment opportunities.

For the other remaining variables related to the HH head, education plays a crucial role in lowering the incidence of poverty. The highest probability values for *HHedu* were noted in Central Punjab, namely for districts Lahore (−0.1076) and Gujranwala (−0.0966), as the abundant employment opportunities in these districts

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[9] Since convergence was not attained, the *OI* variable has been dropped.

Table 6. District wise logit regression results for poverty incidence (marginal effects)

No.	Districts	RI	Dep	HS	HHedu	HHage	MHH	HHMS	Constant	Obs.
1	Attock	-0.1694*** (0.0251)	0.0307*** (0.0062)	0.0573* (0.0361)	-0.0206*** (0.0052)	-0.0013*** (0.0005)	0.0147 (0.0593)	-0.0305*** (0.0179)	-0.1598*** (0.0251)	981
2	Bhakkar	-0.2698** (0.1114)	0.0218* (0.0073)	0.1255*** (0.0394)	-0.0312*** (0.0118)	-0.0021* (0.0011)	-0.0088 (0.1151)	-0.0207 (0.0268)	-0.2287*** (0.0151)	773
3	Chakwal	-0.1713*** (0.0333)	0.0238* (0.0055)	-0.0754 (0.0515)	-0.0401*** (0.0093)	-0.0017* (0.0011)	-0.1301** (0.0599)	-0.0081 (0.0207)	-0.2098*** (0.0612)	1012
4	Gujrat	-0.1214*** (0.0161)	0.0074** (0.0032)	-0.0603** (0.0380)	-0.0875*** (0.0043)	-0.0017** (0.0008)	-0.1547** (0.0233)	-0.0073 (0.0123)	-0.0937* (0.0584)	1014
5	Jhelum	-0.1942*** (0.0373)	0.0435* (0.0076)	-0.0076 (0.0435)	-0.0525* (0.0115)	-0.0014*** (0.0005)	-0.2042* (0.0621)	-0.0009 (0.0218)	-0.1887*** (0.0305)	825
6	Khushab	-0.2487* (0.044)	0.0158*** (0.0081)	0.0655* (0.0394)	-0.0392*** (0.012)	-0.0020* (0.0012)	0.0899 (0.078)	-0.0171 (0.031)	-0.1781 (0.1344)	645
7	Mandi Bahaudin	-0.154*** (0.024)	0.0191* (0.0066)	0.0664* (0.0395)	-0.0516*** (0.0098)	-0.0022* (0.0013)	-0.0424 (0.051)	-0.0328* (0.0202)	-0.1124*** (0.0468)	729
8	Mianwali	-0.229** (0.116)	0.0136*** (0.007)	0.0977*** (0.0336)	-0.0325* (0.003)	-0.0056*** (0.0011)	-0.1173*** (0.0589)	-0.0275 (0.0237)	-0.2051*** (0.0092)	715
9	Rawalpindi	-0.1164*** (0.0207)	0.0109*** (0.0061)	-0.0554* (0.0307)	-0.0781*** (0.009)	-0.0008** (0.0004)	0.0338 (0.0445)	-0.021 (0.0205)	-0.1349*** (0.0248)	688
10	Sargodha	-0.1372* (0.0383)	0.0147** (0.0065)	-0.0964*** (0.0319)	-0.0747*** (0.0087)	-0.0030* (0.0019)	-0.0976** (0.0479)	-0.0001 (0.0178)	-0.1301** (0.0646)	1145
11	Chiniot	-0.1738* (0.0542)	0.0242* (0.0066)	0.1240*** (0.0411)	-0.051*** (0.0102)	-0.0022** (0.0013)	-0.011 (0.0814)	-0.0014 (0.021)	-0.1107*** (0.0285)	732
12	Faisalabad	-0.1348* (0.0185)	0.0169* (0.0033)	-0.0121 (0.0249)	-0.0745*** (0.0044)	-0.0058 (0.0367)	-0.0682** (0.0319)	-0.0006 (0.0112)	-0.0952*** (0.0272)	1727
13	Gujranwala	-0.1285** (0.0121)	0.0103* (0.003)	-0.1211*** (0.0249)	-0.0949* (0.0089)	-0.0014** (0.0009)	-0.1045** (0.0248)	-0.0036** (0.013)	-0.1485 (0.1021)	1345

Table 6. Continued

No.	Districts	RI	Dep	HS	HHedu	HHage	MHH	HHMS	Constant	Obs.
14	Hafizabad	-0.1216** (0.0553)	0.0079*** (0.0045)	-0.0698* (0.0411)	-0.0555*** (0.0115)	-0.0018*** (0.0005)	0.0964 (0.0731)	-0.0011 (0.0253)	-0.2547*** (0.0274)	642
15	Jhang	-0.1917* (0.0441)	0.039* (0.0053)	0.0986*** (0.0339)	-0.0439*** (0.0088)	-0.0006 (0.0004)	-0.1224*** (0.071)	-0.008 (0.0175)	-0.1227*** (0.0156)	978
16	Kasur	-0.1554* (0.0894)	0.0269* (0.0057)	-0.0792 (0.3519)	-0.0643*** (0.0089)	-0.0024*** (0.0010)	-0.1807* (0.0619)	-0.0084 (0.02)	-0.1461*** (0.0549)	1067
17	Lahore	-0.0709* (0.0212)	0.0085* (0.0025)	-0.0786*** (0.0259)	-0.1059*** (0.0116)	-0.0011* (0.0007)	0.0385 (0.0285)	-0.0178 (0.0151)	-0.0757 (0.0481)	1747
18	Nankana Sahib	-0.1432*** (0.0248)	0.0211* (0.0068)	0.0106 (0.0392)	-0.0579*** (0.0098)	-0.0020*** (0.0004)	-0.0504*** (0.0665)	-0.0251** (0.0219)	-0.149*** (0.0336)	718
19	Narowal	-0.1639*** (0.017)	0.0097*** (0.005)	-0.0831** (0.0393)	-0.0531*** (0.0091)	-0.0015* (0.001)	-0.3226* (0.041)	-0.0362 (0.0284)	-0.1284** (0.0552)	881
20	Okara	-0.2141* (0.0249)	0.0112*** (0.0064)	0.0549 (0.0329)	-0.0596*** (0.01)	-0.0005 (0.0015)	-0.1131** (0.0498)	-0.0085 (0.0202)	-0.1305*** (0.0447)	758
21	Pakpattan	-0.1642*** (0.0235)	0.0108*** (0.0052)	-0.0332 (0.0382)	-0.0525*** (0.0102)	-0.0023*** (0.0010)	-0.1722*** (0.0599)	-0.0147 (0.0199)	-0.1204*** (0.0312)	840
22	Sahiwal	-0.1158*** (0.0227)	0.0161* (0.004)	-0.0220 (0.0318)	-0.0516*** (0.0056)	-0.0010* (0.0006)	-0.1003* (0.035)	-0.0223 (0.0207)	-0.1404*** (0.0424)	1287
23	Sheikhupura	-0.118* (0.0389)	0.0268* (0.0048)	-0.0568** (0.0314)	-0.0508*** (0.0071)	-0.0009** (0.0003)	-0.1313** (0.0558)	-0.0013 (0.0207)	-0.108*** (0.0214)	1096
24	Sialkot	-0.1076*** (0.0138)	0.0132* (0.0026)	-0.0726** (0.0328)	-0.0626*** (0.0044)	-0.0004 (0.0005)	-0.1243* (0.0236)	-0.0181 (0.0185)	-0.1239** (0.0505)	1297
25	Toba Tek Singh	-0.1471* (0.02)	0.0164* (0.0051)	-0.0592 (0.0368)	-0.0578*** (0.0065)	-0.0052*** (0.0013)	-0.1564* (0.0472)	-0.027 (0.0178)	-0.1258*** (0.04)	988
26	Bahawalpur	-0.1913* (0.0538)	0.033* (0.006)	0.0862*** (0.0354)	-0.034*** (0.0092)	-0.0021* (0.0013)	-0.1301** (0.0579)	-0.026*** (0.0161)	-0.1159*** (0.0265)	1169

Table 6. Continued

No.	Districts	RI	Dep	HS	HHedu	HHage	MHH	HHMS	Constant	Obs.
27	Bahawalnagar	-0.3055*	0.0451*	0.0782***	-0.0358***	-0.0043***	-0.129***	-0.0201	-0.1809***	1036
		(0.0239)	(0.0065)	(0.0312)	(0.0103)	(0.0014)	(0.0689)	(0.0194)	(0.0376)	
28	DG Khan	-0.1314*	0.0494*	0.1165***	-0.0318***	-0.0003	-0.0841***	-0.0141***	-0.0344	956
		(0.0461)	(0.0066)	(0.0387)	(0.011)	(0.0019)	(0.034)	(0.0084)	(0.0474)	
29	Khanewal	-0.1696*	0.029*	0.0849	-0.0476***	-0.0022**	-0.0421	-0.031**	-0.2538	1071
		(0.038)	(0.0054)	(0.0529)	(0.0078)	(0.0010)	(0.054)	(0.0142)	(0.1875)	
30	Layyah	-0.3002*	0.0357*	0.0939**	-0.0559***	-0.0016***	-0.2008**	-0.0191	-0.0394	888
		(0.0593)	(0.0078)	(0.0407)	(0.0122)	(0.0005)	(0.0801)	(0.0313)	(0.0454)	
31	Lodhran	-0.1971*	0.0374*	0.0471***	-0.0397***	-0.0019**	-0.186*	-0.0137***	-0.1331**	828
		(0.0555)	(0.0068)	(0.0017)	(0.011)	(0.0010)	(0.0695)	(0.0234)	(0.0601)	
32	Multan	-0.1152*	0.029*	-0.0382	-0.0722***	-0.0005**	-0.0642	-0.0269	-0.1352***	1345
		(0.0425)	(0.005)	(0.0337)	(0.0064)	(0.0002)	(0.0432)	(0.0157)	(0.0494)	
33	Muzaffargarh	-0.3147*	0.0445*	0.0925***	-0.0452***	-0.0027**	-0.2558***	-0.0503	-0.1251***	1289
		(0.0427)	(0.006)	(0.0351)	(0.01)	(0.0013)	(0.066)	(0.0401)	(0.036)	
34	Rahim Yar Khan	-0.1988*	0.0351*	0.1261***	-0.049*	-0.0039***	-0.1374***	-0.0494**	-0.1451***	1309
		(0.0396)	(0.005)	(0.0341)	(0.0083)	(0.0016)	(0.0624)	(0.0251)	(0.047)	
35	Rajanpur	-0.3207*	0.029*	0.1055***	-0.047***	-0.0029***	-0.1311***	-0.069***	-0.2187***	805
		(0.0568)	(0.0068)	(0.0324)	(0.0126)	(0.0006)	(0.0832)	(0.0386)	(0.0547)	
36	Vehari	-0.1516*	0.0334*	0.1327***	-0.0403***	-0.0013***	-0.0724**	-0.0042**	-0.0758***	1074
		(0.0291)	(0.0049)	(0.0345)	(0.0077)	(0.0003)	(0.0473)	(0.0177)	(0.009)	

Note: The dependent variable is HCR. The standard errors are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

benefit the educated. The results for the age of the HH head and male-headed HHs have an inverse and significant relationship with poverty incidence in a majority of the districts. A married HH head was found to be significant for poverty reduction in only 10 districts.

Table 7 reports the district wise instrumental variable (2SLS) results of the severity of poverty in Punjab. Remittances appear more important for reducing the severity of poverty in South Punjab relative to North and Central Punjab. For example, migrant HHs in DG Khan and Rajanpur have 0.8531 and 0.6871 less severity of poverty than non-migrant HHs. The remaining variables related to HH characteristics (dependency and HH size) and HH head (education, age, gender and marital status) provide similar results to that of the incidence of poverty.

5.2 Remittances and Urban-Rural Poverty

Table 8 presents the summary of the logit regression results for the incidence of poverty across districts, disaggregated by urban and rural locales. The results show a significant negative relationship between remittances and the incidence of poverty for urban and rural HHs in all districts. For a majority of the districts, remittances reduced the probability to be poor from 5 to 15 percent in urban HHs. The highest probability to be non-poor due to remittances for urban HHs are noted in districts of the South and North Punjab, namely Muzaffargarh and Khushab. The least probability values are observed for districts of Central Punjab like Gujranwala (0.0429), and Faisalabad (0.0467). For rural HHs, the highest probability to be non-poor due to remittances are found in South Punjab, like Layyah (41 percent less poor than non-migrant HHs), Muzaffargarh (36 percent), and Bahawalnagar (34 percent). The least probability values were found in Central Punjab, in districts such as Sialkot and Lahore.

The marginal effects of remittances on the incidence of poverty is much higher for rural HHs relative to urban HHs in all districts. As for the overall sample in Table 5, HHs in the urban and rural districts of South Punjab seem to benefit more from migrant remittances in terms of poverty reduction, relative to the other locales.

To identify differences in the urban-rural context, the district wise results of poverty severity are also compared. Table 9 summarises the 2SLS results for the severity of poverty for both urban and rural HHs. Similar to the incidence of poverty, the results show a significant inverse relationship between remittances and the severity of poverty for both urban and rural HHs in all districts. The results in Table 9 also demonstrate that remittances are more important to reduce the severity of poverty in rural than urban areas. The largest effect of remittances on the severity of poverty on urban HHs are noted for Lodhran and Rajanpur, and the least for Faisalabad and Lahore. In the case of rural HHs, the largest impact of remittances on the severity of poverty are found in the South districts, DG Khan, Rajanpur and Bahawalpur, while the least impact are in districts of Central Punjab, Lahore, Kasur and Faisalabad.

Migrant HHs may differ from non-migrant HHs in terms of ability, skills and motivation to work. So, to compare the severity of poverty for migrant HHs with non-migrant HHs, the PSM technique is adopted. Table 10 presents the PSM results on a quartile basis. Considering the fact that the spending patterns of remittances may differ

Table 7. District wise instrumental variable (2SLS) regression results for poverty severity

No.	Districts	RI	Dep	HS	HHedu	HHage	MHH	HHMS	Constant	Obs.
1	Attock	-0.4643**	0.0326*	0.0063*	-0.0869***	-0.0015***	-0.0432***	-0.0477*	0.0786	981
		(0.2382)	(0.0198)	(0.0035)	(0.0199)	(0.0006)	(0.0193)	(0.0268)	(0.2553)	
2	Bhakkar	-0.5988*	0.0427***	0.0104*	-0.1385***	-0.0042*	-0.0134**	-0.0686	-0.0982	773
		(0.3333)	(0.0129)	(0.0061)	(0.0313)	(0.0024)	(0.0065)	(0.0720)	(0.5335)	
3	Chakwal	-0.4435***	0.0357*	0.0161	-0.0466*	-0.0022*	-0.2715*	-0.0561***	0.2634	1012
		(0.1827)	(0.0206)	(0.0141)	(0.0239)	(0.0012)	(0.1940)	(0.0121)	(0.2596)	
4	Gujrat	-0.3553***	0.0204	0.0033	-0.0123	-0.0055***	-0.4344***	-0.0171	-0.1203	1014
		(0.1299)	(0.0306)	(0.0090)	(0.0161)	(0.0016)	(0.0663)	(0.0263)	(0.1541)	
5	Jhelum	-0.8973***	0.0535**	0.0030	-0.0922***	-0.0051**	-0.6005***	-0.0207	-0.0413	825
		(0.2975)	(0.0214)	(0.0137)	(0.0219)	(0.0026)	(0.1566)	(0.0413)	(0.2827)	
6	Khushab	-0.7900*	0.0664***	0.0114**	-0.0956***	-0.0026**	-0.6113***	-0.0319	0.1746	645
		(0.4501)	(0.0203)	(0.0059)	(0.0206)	(0.0013)	(0.1752)	(0.0457)	(0.2592)	
7	Mandi Bahaudin	-0.5998***	0.0367**	0.0016	-0.0529***	-0.0067***	-0.4157***	-0.0374*	0.0438	729
		(0.2327)	(0.0188)	(0.0131)	(0.0195)	(0.0023)	(0.1205)	(0.0246)	(0.2285)	
8	Mianwali	-0.5206***	0.0417*	0.0026*	-0.0972***	-0.0062**	-0.1228**	-0.0875	-0.2232	715
		(0.1916)	(0.0263)	(0.0015)	(0.0290)	(0.0032)	(0.0639)	(0.0587)	(0.4710)	
9	Rawalpindi	-0.4323***	0.0245	-0.0449	-0.0322***	-0.0009*	-0.0420*	-0.0317	-3.5759	688
		(0.1831)	(0.0216)	(0.0564)	(0.0117)	(0.0005)	(0.0264)	(0.1652)	(3.4642)	
10	Sargodha	-0.5972*	0.0241	-0.0092	-0.0552***	-0.0034**	-0.1786*	-0.0766**	0.3638*	1145
		(0.3225)	(0.0178)	(0.0131)	(0.0179)	(0.0018)	(0.0990)	(0.0349)	(0.1996)	
11	Chiniot	-0.4519*	0.0543***	0.0238*	-0.0041*	-0.0028***	-0.0177**	-0.0312	0.2248	732
		(0.2871)	(0.0193)	(0.0134)	(0.0024)	(0.0012)	(0.0902)	(0.0399)	(0.2583)	
12	Faisalabad	-0.2787*	0.0317	-0.0006**	-0.0507*	-0.0072**	-0.0868****	-0.1084*	-1.0205*	1727
		(0.1677)	(0.0277)	(0.0003)	(0.0300)	(0.0038)	(0.0506)	(0.0582)	(0.5356)	
13	Gujranwala	-0.2464*	0.0595	-0.0012*	-0.0226*	-0.0070***	-0.1756***	-0.0563***	-0.4174*	1345
		(0.1302)	(0.0449)	(0.0007)	(0.0154)	(0.0024)	(0.0594)	(0.0272)	(0.2430)	

Table 7. Continued

No.	Districts	RI	Dep	HS	HHedu	HHage	MHH	HHMS	Constant	Obs.
14	Hafizabad	-0.4336*** (0.1934)	0.0549*** (0.0213)	-0.0127 (0.0149)	-0.0909*** (0.0224)	-0.0046** (0.0030)	-0.1875* (0.1275)	-0.0784 (0.0513)	-0.1850 (0.3798)	642
15	Jhang	-0.3244** (0.1566)	0.0524*** (0.0168)	0.0019 (0.0241)	-0.0474*** (0.0139)	-0.0017** (0.0008)	-0.1579** (0.0653)	-0.0600 (0.0614)	-0.4859 (0.5694)	978
16	Kasur	-0.5060*** (0.1703)	0.0432 (0.0282)	-0.0153 (0.0115)	-0.0636*** (0.0194)	-0.0026** (0.0012)	-0.2517*** (0.0907)	-0.0304 (0.0366)	-0.1233 (0.2607)	1067
17	Lahore	-0.0959* (0.0620)	0.0332 (0.0306)	-0.0284*** (0.0102)	-0.0767*** (0.0136)	-0.0018* (0.0011)	-0.0455** (0.0290)	-0.0069 (0.0320)	0.2600 (0.1683)	1747
18	Nankana Sahib	-0.2547** (0.1200)	0.0358** (0.0162)	0.0043*** (0.0010)	-0.0518*** (0.0184)	-0.0027* (0.0017)	-0.0827*** (0.0511)	-0.0635*** (0.0222)	0.0918 (0.2332)	718
19	Narowal	-0.4645* (0.2935)	0.0357** (0.0145)	0.0008* (0.0005)	-0.0340*** (0.0174)	-0.0025* (0.0015)	-0.4927*** (0.1005)	-0.1175*** (0.0411)	0.0840 (0.1789)	881
20	Okara	-0.3845*** (0.0980)	0.0395* (0.0205)	0.0047** (0.0021)	-0.0367* (0.0234)	-0.0028* (0.0015)	-0.2970*** (0.1254)	-0.0412 (0.0474)	-0.0271 (0.2762)	758
21	Pakpattan	-0.3893*** (0.1509)	0.0541*** (0.0149)	0.0054** (0.0026)	-0.0608* (0.0325)	-0.0035*** (0.0014)	-0.2833*** (0.1219)	-0.0860 (0.0628)	-0.1286 (0.4238)	840
22	Sahiwal	-0.2756*** (0.1129)	0.0466** (0.0204)	0.0021* (0.0013)	-0.0816*** (0.0214)	-0.0019* (0.0012)	-0.1851** (0.0083)	-0.0453 (0.0423)	0.0663 (0.2820)	1287
23	Sheikhupura	-0.2468** (0.1144)	0.0221 (0.0205)	-0.0047 (0.0143)	-0.0435** (0.0221)	-0.0044* (0.0027)	-0.2686*** (0.1290)	-0.0258** (0.0059)	-0.6832* (0.3734)	1096
24	Sialkot	-0.2679** (0.1309)	0.0530 (0.1447)	-0.0032** (0.0013)	-0.0328** (0.0161)	-0.0088*** (0.0026)	-0.1956** (0.1168)	-0.0744* (0.0495)	-0.5195** (0.2483)	1297
25	Toba Tek Singh	-0.3867* (0.2189)	0.0475*** (0.0131)	0.0152* (0.0093)	-0.0778*** (0.0128)	-0.0030* (0.0015)	-0.2456*** (0.1069)	-0.0578** (0.0249)	0.6204*** (0.1493)	988
26	Bahawalpur	-0.5755*** (0.1637)	0.0508** (0.0251)	0.0078* (0.0048)	-0.0396* (0.0201)	-0.0031* (0.0017)	-0.2641** (0.1222)	-0.0343*** (0.0153)	0.2328 (0.3200)	1169

Table 7. Continued

No.	Districts	RI	Dep	HS	HHedu	HHage	MHH	HHMS	Constant	Obs.
27	Bahawalnagar	-0.7667** (0.3668)	0.0750*** (0.0274)	0.0024* (0.0015)	-0.0317* (0.0202)	-0.0052* (0.0030)	-0.2503** (0.1367)	-0.0298** (0.0126)	-0.6082 (0.4188)	1036
28	DG Khan	-0.8531** (0.3942)	0.0536*** (0.0145)	0.0025* (0.0016)	-0.1663* (0.1015)	-0.0109** (0.0041)	-0.1742*** (0.0681)	-0.0686** (0.0307)	-3.2997 (4.6451)	956
29	Khanewal	-0.3652*** (0.1437)	0.0634*** (0.0228)	0.0083 (0.0168)	-0.0391* (0.0210)	-0.0026** (0.0012)	-0.0658*** (0.01921)	-0.0761* (0.0470)	-0.5415 (0.5863)	1071
30	Layyah	-0.4584*** (0.1403)	0.1341* (0.0767)	0.0026* (0.0017)	-0.0295** (0.0155)	-0.0050** (0.0029)	-0.3102*** (0.1341)	-0.0972 (0.1592)	-1.6914 (1.7673)	888
31	Lodhran	-0.4797*** (0.1794)	0.0515* (0.0306)	0.0062 (0.0216)	-0.1191*** (0.0316)	-0.0037* (0.0023)	-0.2961* (0.1848)	-0.0208* (0.0138)	0.0221 (0.3824)	828
32	Multan	-0.1759* (0.0944)	0.0475 (0.0539)	-0.0064 (0.0391)	-0.0695* (0.0457)	-0.0037** (0.0017)	-0.0942* (0.0514)	-0.0352 (0.2338)	-2.1659 (1.6427)	1345
33	Muzaffargarh	-0.5595*** (0.2464)	0.0694** (0.0278)	0.0013* (0.0007)	-0.0919*** (0.0266)	-0.0039** (0.0017)	-0.3939* (0.2242)	-0.0860*** (0.0168)	-0.5984 (0.5603)	1289
34	Rahim Yar Khan	-0.4970*** 0.1718	0.0502** (0.0300)	0.0059*** (0.0021)	-0.0961*** (0.0257)	-0.0052** (0.0031)	-0.2419* (0.1417)	-0.0624** (0.0280)	-0.2013 (0.4056)	1309
35	Rajanpur	-0.6871*** (0.2652)	0.0615** (0.0329)	0.0024* (0.0015)	-0.0630* (0.0331)	-0.0041** (0.0017)	-0.1850** (0.0797)	-0.0996* (0.0539)	-0.8838 (0.6637)	805
36	Vehari	-0.4417*** (0.0655)	0.0333* (0.0213)	0.0237 (0.0215)	-0.0389* (0.0228)	-0.0029** (0.0014)	-0.1357* (0.0705)	-0.0692** (0.0337)	-0.5703 (0.4264)	1074

Note: The dependent variable is PGS. The standard errors are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8. Summary of logit regression results for poverty incidence, by districts and urban-rural locales (marginal effects)

No.	Districts	RI (urban)	RI (rural)	Observations
1	Attock	-0.1031*** (0.0321)	-0.1617*** (0.0344)	303
2	Bhakkar	-0.1188*** (0.0466)	-0.2168*** (0.0957)	237
3	Chakwal	-0.1175*** (0.0345)	-0.2310** (0.0960)	201
4	Gujrat	-0.0682*** (0.0189)	-0.0663*** (0.0248)	418
5	Jhelum	-0.1265*** (0.0298)	-0.2075*** (0.0543)	281
6	Khushab	-0.1332** (0.0577)	-0.3359*** (0.0636)	260
7	Mandi Bahaudin	-0.0710* (0.0374)	-0.2512*** (0.0325)	245
8	Mianwali	-0.1069*** (0.0433)	-0.2076*** (0.0017)	247
9	Rawalpindi	-0.0607** (0.0307)	-0.1447*** (0.0295)	710
10	Sargodha	-0.0554* (0.0311)	-0.0801* (0.0490)	463
11	Chiniot	-0.1295* (0.0817)	-0.1315*** (0.0068)	268
12	Faisalabad	-0.0467** (0.0216)	-0.0892*** (0.0301)	840
13	Gujranwala	-0.0429*** (0.0159)	-0.0697*** (0.0214)	725
14	Hafizabad	-0.0570*** (0.0019)	-0.1750*** (0.0633)	258
15	Jhang	-0.1027*** (0.0410)	-0.1824** (0.0925)	367
16	Kasur	-0.0729** (0.0369)	-0.0886* (0.0519)	396
17	Lahore	-0.0473*** (0.0155)	-0.0589* (0.0171)	1243
18	Nankana Sahib	-0.0972* (0.0575)	-0.2544*** (0.0472)	221
19	Narowal	-0.0528* (0.0332)	-0.1836*** (0.0236)	237

Table 8. Continued

No.	Districts	RI (urban)	RI (rural)	Observations
20	Okara	-0.1078* (0.0670)	-0.2521*** (0.0328)	374
21	Pakpattan	-0.1037** (0.0525)	-0.2689*** (0.0379)	252
22	Sahiwal	-0.0782* (0.0466)	-0.1287*** (0.0376)	308
23	Sheikhupura	-0.0817** (0.0356)	-0.0995* (0.0580)	450
24	Sialkot	-0.0486*** (0.0186)	-0.0540** (0.0219)	478
25	Toba Tek Singh	-0.1083*** (0.0233)	-0.3280*** (0.0438)	327
26	Bahawalpur	-0.0954* (0.0567)	-0.2501*** (0.0731)	442
27	Bahawalnagar	-0.0897** (0.0454)	-0.3410*** (0.0459)	329
28	DG Khan	0.1027* (0.0618)	-0.3223*** (0.0591)	279
29	Khanewal	-0.0919* (0.0578)	-0.2138*** (0.0463)	337
30	Layyah	-0.0964* (0.0545)	-0.4117*** (0.0688)	244
31	Lodhran	-0.1197* (0.0708)	-0.1949** (0.0781)	257
32	Multan	-0.1028*** (0.0361)	-0.1054*** (0.0367)	620
33	Muzaffargarh	-0.1672* (0.1022)	-0.3601*** (0.0514)	352
34	Rahim Yar Khan	-0.1033** (0.0512)	-0.2507*** (0.0591)	452
35	Rajanpur	-0.1305** (0.0658)	-0.2929*** (0.1104)	246
36	Vehari	0.0919* (0.0586)	-0.1583*** (0.0460)	354

Note: The dependent variable is HCR. The standard errors are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9. Summary of instrumental variable (2SLS) regression results for poverty severity, by districts and urban-rural locales

No.	Districts	RI (urban)	RI (rural)	Observations
1	Attock	-0.0677*** (0.0271)	-0.1209*** (0.0237)	303
2	Bhakkar	-0.0683* (0.0443)	-0.1991*** (0.0383)	237
3	Chakwal	-0.0835*** (0.0324)	-0.1105*** (0.0127)	201
4	Gujrat	-0.0428*** (0.0172)	-0.086*** (0.0136)	418
5	Jhelum	-0.0647* (0.0418)	-0.1111*** (0.0335)	281
6	Khushab	-0.0888*** (0.0102)	-0.1915*** (0.0452)	260
7	Mandi Bahaudin	-0.0716* (0.0441)	-0.0906*** (0.006)	245
8	Mianwali	-0.0899*** (0.0386)	-0.2021*** (0.027)	247
9	Rawalpindi	-0.0628** (0.0328)	-0.0914*** (0.0212)	710
10	Sargodha	-0.0389** (0.0193)	-0.0908*** (0.0136)	463
11	Chiniot	-0.0393* (0.0229)	-0.1129*** (0.0558)	268
12	Faisalabad	-0.0316** (0.0158)	-0.0618*** (0.0176)	840
13	Gujranwala	-0.0380* (0.0231)	-0.1210*** (0.0342)	725
14	Hafizabad	-0.0552* (0.0328)	-0.1426*** (0.0253)	258
15	Jhang	-0.0659** (0.0310)	-0.1828*** (0.0199)	367
16	Kasur	-0.0480* (0.0308)	-0.0595* (0.0387)	396
17	Lahore	-0.0324* (0.0175)	-0.0590*** (0.0092)	1243
18	Nankana Sahib	-0.0721** (0.0361)	-0.1211*** (0.0289)	221
19	Narowal	-0.0794* (0.0486)	-0.1072*** (0.0146)	237

Table 9. Continued

No.	Districts	RI (urban)	RI (rural)	Observations
20	Okara	-0.0736* (0.0457)	-0.1105*** (0.0082)	374
21	Pakpattan	-0.0831*** (0.0286)	-0.1217*** (0.0342)	252
22	Sahiwal	-0.0661*** (0.0244)	-0.1097*** (0.0378)	308
23	Sheikhupura	-0.0518** (0.0241)	-0.0716*** (0.023)	450
24	Sialkot	-0.0482* (0.0263)	-0.0655*** (0.0073)	478
25	Toba Tek Singh	-0.0636* (0.0366)	-0.1118*** (0.019)	327
26	Bahawalpur	-0.0712* (0.0461)	-0.2311*** (0.0283)	442
27	Bahawalnagar	-0.0491*** (0.0177)	-0.1775*** (0.0491)	329
28	DG Khan	-0.0839*** (0.0104)	-0.2663*** (0.04)	279
29	Khanewal	-0.0477* (0.0315)	-0.1119*** (0.024)	337
30	Layyah	-0.0685* (0.0455)	-0.1825*** (0.0561)	244
31	Lodhran	-0.0902** (0.0408)	-0.1151*** (0.0258)	257
32	Multan	-0.0786** (0.0415)	-0.1338*** (0.0347)	620
33	Muzaffargarh	-0.0944*** (0.0359)	-0.1621*** (0.0213)	352
34	Rahim Yar Khan	-0.0791** (0.0397)	-0.1284*** (0.0328)	452
35	Rajanpur	-0.0947*** (0.0338)	-0.2191*** (0.0501)	246
36	Vehari	-0.0884** (0.0403)	-0.1012*** (0.0449)	354

Note: The dependent variable is PGS. The standard errors are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 10. PSM (Kernel, Gaussian) per quartile of household poverty

Quartile	Treated	Control	ATT	T	No. of treated	No. of untreated
1&2	0.3347	0.5926	0.2579***	10.64	873	17333
3	0.2197	0.5635	0.3438***	9.65	860	8237
4	0.0913	0.3558	0.2645***	12.76	1158	7939

Note: *** $p < 0.01$.

between the poor and rich HHs, the sample is divided into four groups according to their propensity scores. The matching is done for the HHs in each quartile separately. Due to the lower inflows of remittances to the less wealthy HHs, the first two quartiles are merged in order to get a sufficient sample size. The results show that in the case of Punjab, remittances are more beneficial for the rich relative to the poor HHs (Average Treatment effect on Treated or ATT of richer HHs are higher than the ATT of the poorest HHs).

6. Concluding Remarks

This study profiles the HH-based poverty incidence and severity at the district-level before examining the impact of remittances on the former. Importantly, this paper finds that provincial level statistics on poverty are not useful for understanding the situation at the HH-level for the following reasons: First, poverty levels in Punjab vary significantly across districts and within districts (urban-rural). Notably, South Punjab is not only found to be much poorer based on headcount poverty and severity of poverty relative to districts in the North and Central Punjab; it is also the region with profound intra-district variations in poverty. The level and depth of poverty is also higher in the rural relative to the urban locales. Second, though poverty is reduced for migrant HHs when considering their income with remittances and the counterfactual scenario of no remittances, the differences in the 'remittance reduction effect' on poverty varies significantly across districts. The positive differences of remittances on migrant HHs were found to be relatively large in three districts located in the Central and North Punjab locales. The district-level differences in the remittance reduction effects on poverty also reveal that it affects the incidence of poverty for most districts rather than the severity of poverty. International remittances have more impact on reducing the poverty headcount than on the depth of poverty, in other words, they were not really helpful for the poorest of the poor.

The varying patterns in poverty profiled at the district and locale contexts justify examining the remittance-poverty nexus at this disaggregated level. The regression analyses reveal international remittances have an inverse relationship with the level and depth of poverty for all districts and urban-rural locales of Punjab, especially for South Punjab. Targeting poverty at higher levels of aggregation would thus likely miss pockets of extreme poverty.

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