

NORWEGIAN UNIVERSITY OF LIFE SCIENCES



**Impact of Foreign Remittances on Household Poverty in Pakistan:
Evidence from household Data**

Master Thesis in Economics

(30 credits)

By

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Summary

The impact of foreign remittances on household poverty in Pakistan using Household Integrated Economic Survey of Pakistan (HIES) data for 2007-08 are studied by employing Propensity Score Matching (PSM) method. Average treatment effect on treated for the impact assessment of foreign remittances on per capita income and poverty levels in Pakistan are estimated.

Results of average treatment effect estimates suggest that remittances enhance the per capita income by about 45 percent when compared 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.

Results also indicate 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, 36 percent, compared to the rural households at 23 percent.

Our impact assessment results conclude that keeping other factors constant, remittances boost up 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. To reduce poverty, the Government should facilitate and encourage expatriate Pakistanis in sending remittances to their home country. Issuance of Remittance bonds seems to be an appropriate step in this regard. 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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1. Introduction

Remittances are becoming an increasingly more important source of external financing for many countries¹. 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 during 2006, double the value of official aid to the developing countries (Adams and Cuecuecha, 2010)². Remittances these days are not only a source of high foreign exchange earnings for developing countries but also a mode to reduce poverty, act as a catalyst for fostering investment in physical and human capital and increased labor force participation (Andersson, 2012; Adams and Cuecuecha, 2010; Cox-Edwards and Rodriguez-Oreggia, 2009; Shroff, 2009). Remittance inflows can reduce poverty by stimulating incomes of the recipient country, enhancing human development through financing better education and health hence contribute remarkably in economic uplift of the poor households (Koc and Onan, 2001; Munir et al., 2007; Qayyum et al., 2007; Banga and Sahu, 2010;).

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 foreign exchange that can lead to 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

¹ 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)

² Remittances to developing countries exhibited a growth rate of 6.5 percent between 2006 to 2012 (World Bank, 2012)

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 smoothing consumption. 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 it 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. Furthermore, the impact of remittances on poverty at the household level is also conditional on whether the migration has been performed legally or through illegal channels. In the case of illegal migration, migrants find it harder to be an active member of the workforce in the host country. This affects their ability to send remittances back home and halts their capabilities to raise the income levels of their families.

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, the 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 Pakistan³. 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 paper is to answer following three questions.

First, what is the impact of foreign remittances on the per capita incomes of the households?

Second, do the remittances reduce the probability of households getting under the poverty line in Pakistan?

Third, are there any rural-urban differences between the impacts of remittances on poverty levels?

By answering these questions in this paper, we attempt to fill this gap in the empirical literature on Pakistan and identify the potential of foreign remittances as a poverty eradication tool. For this purpose, we use Household Integrated Economic Survey of Pakistan (2007-08) data

³ 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.

to evaluate the impact of foreign remittances on household poverty and employ propensity score matching approach to estimate the treatment effects on treated.

The rest of the paper is organized as follows; Section 2 discusses the trends of foreign remittances in Pakistan. Section 3 reviews relevant literature on the issue; section 4 delineates the methodological approach, section 5 presents empirical results while section 6 concludes the paper.

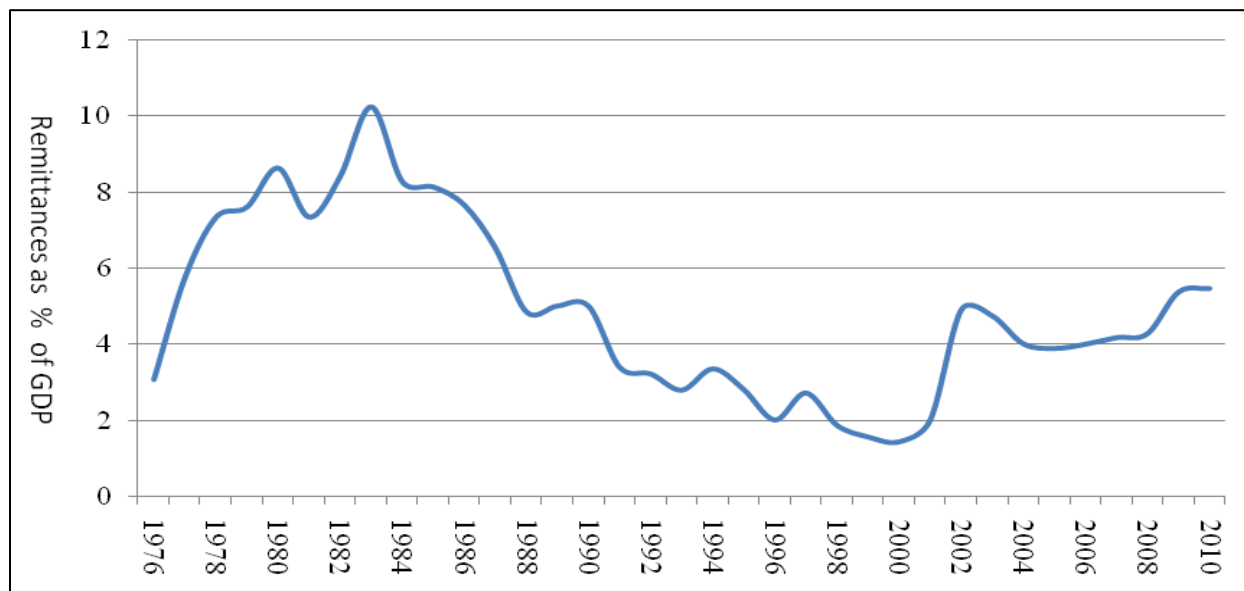
2. Remittances and Poverty trends in Pakistan

Labor migration from Pakistan to different parts of the world started with a relatively higher pace from mid-1970s where migration to the Middle East was the most significant one. Until the start of the 1970s, UK was the largest contributor to remittances inflows to Pakistan with 54% share in the total remittances. However this distribution changed in the aftermath of 1970s oil crisis as demand for labor in Gulf countries increased and substantial number of workers moved to the Middle Eastern countries. These developments led to an increase in remittances to GDP ratio which reached to the highest level of its history in 1983 (Figure 1) and for this particular year, receipts from remittance inflows were even higher than the export receipts. Towards the end of the 1980s, the share of foreign remittances from Saudi Arabia and UAE became considerably high. Later, due to the introduction of *green card policy* by USA in 1990s, USA became a favorite destination of workers from Pakistan and huge numbers of laborers moved to USA and have been significantly contributing to the home remittances since then⁴.

Remittances as a percentage of GDP started to decline after 1983 and reached its minimum levels during 1990s mainly due to low GDP growth rate and political instability throughout the

⁴ This is represented by the share of remittances from US to the total remittances in Pakistan sent through official channels. In 1973, the share of remittances sent to Pakistan from US was 7 percent, which increased to 20 percent in 2010. Share of remittances from US was highest at 37 percent in 1996.

decade⁵. This ratio started to rise again in 2002 when the inflow of remittances increased in the aftermath of 9/11 incidents (Figure 1) and their underlying trend is upward since then.

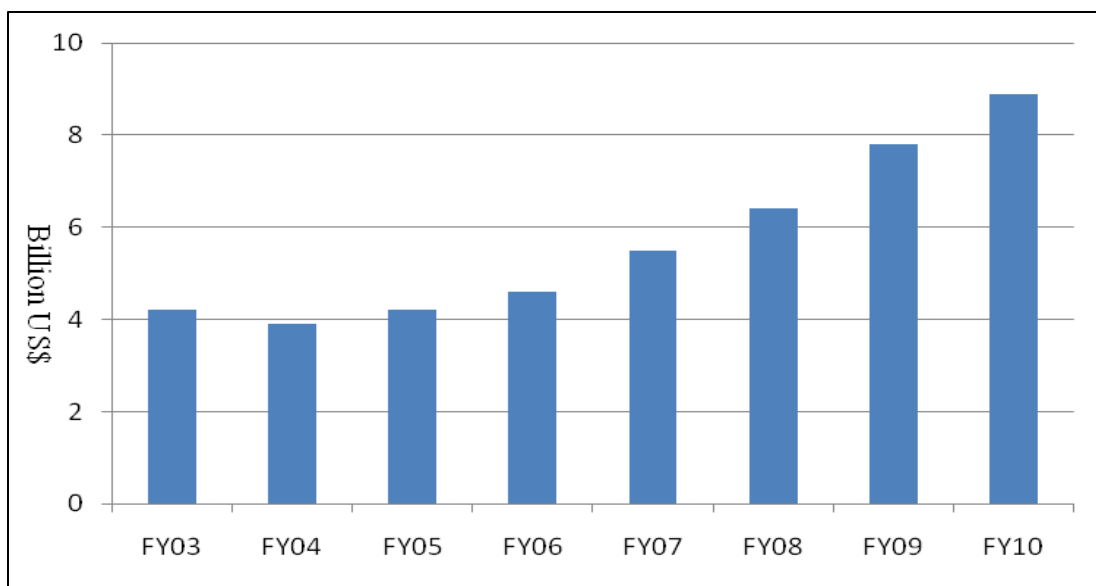


Source: World Development Indicators, World Bank, 2012

Figure 1: Remittances inflows as percentage of GDP

Inflow of foreign remittances in absolute terms increased to 8.9 US\$ during fiscal year 2010 (Figure 2) and Pakistan became the 10th largest recipient of foreign remittances in the world. Remittances growth, especially from 2008-09 onwards, can also be attributed to global financial crisis when migrant workers returned to home country along with accumulated savings. Most of these remittances have originated from the Gulf region with a contribution of 54 percent to the overall remittance inflows (Table 1). Within the Gulf region, United Arab Emirates (UAE) and Saudi Arabia are the biggest contributors respectively. Remittances from these two countries alone comprise of 82 percent of the total remittances from the Gulf region. Other than the Gulf region, USA and UK are the major contributors to remittance inflows in Pakistan.

⁵ The decade of 1990s is considered to be the “lost decade” in Pakistan’s history due to worst economic performance caused mainly by political instability after the return of democracy to the country. Especially in 1998, Government of Pakistan’s decision to freeze foreign currency accounts of the residents brought financial insecurity to the expatriate Pakistanis and flow of remittances to Pakistan reduced further.



Source: State Bank of Pakistan, 2011

Figure 2: Recent trends in foreign remittances to Pakistan

Countries	FY09	FY10
Gulf region:	4 086.20	4 875.30
Bahrain	153.2	151.3
Kuwait	432	445.1
Qatar	24.9	34.8
Saudi Arabia	1 559.50	1 917.90
Oman	227.8	287.3
U.A.E	1 688.60	2 038.90
U.S.A	1 735.90	1771.3
U.K	605.60	876.3
Canada	79.10	115.1
Germany	100.70	81.2
Japan	5.10	5.6
Australia	34.30	56.2
Others	1 164.10	1 124.50
Total	7 810.90	8 905.80

Source: State Bank of Pakistan, 2010-11

The use of remittances in Pakistan has also been largely debated where quite a number of studies suggest that remittances are mainly spent on consumption expenditures, debt repayment, construction of houses, purchase of real estate and performance of pilgrim (Hajj) (Muhammed et al., 2010; Arif, 2010; Khan et al., 2009; Saleem and Aslam ,2007). The role of remittances in setting up of new businesses and capital formation has been quite limited at the household level. Saleem and Aslam (2007) find that income from foreign remittances is mostly spent on meeting basic needs, purchasing property, business and on paying off the debts. Khan et al. (2009) examine that a significant change occurs in all households’ accessories and facilities after they start receiving remittances. Ahmed et al. (2010) found that the shares of household expenditures on food, education, clothing, and recreation increases with the availability of resources through foreign remittances.

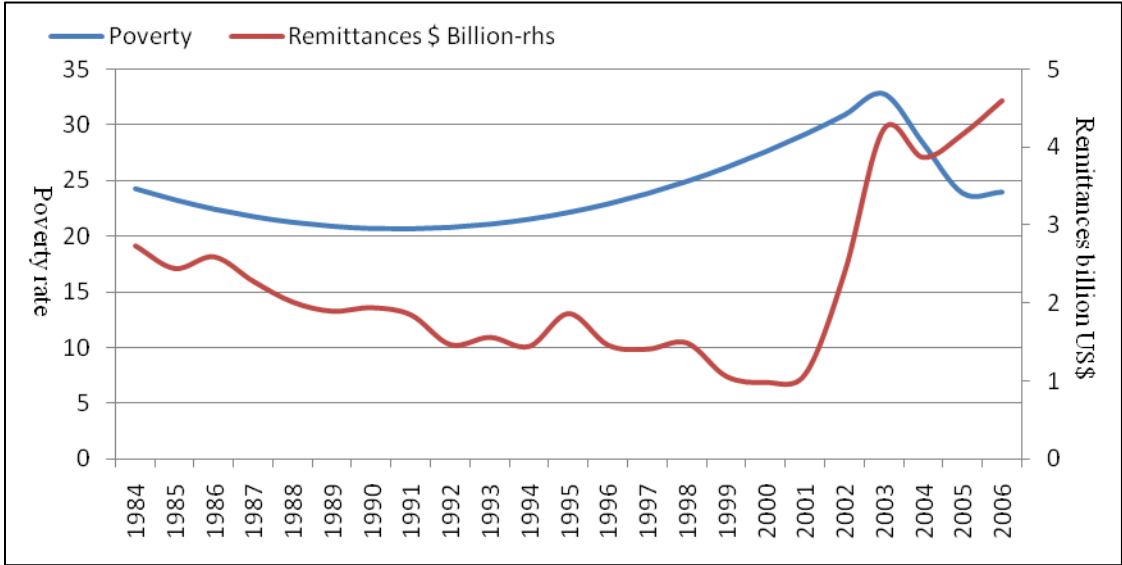


Figure 3 Relationship between remittances inflow and poverty in Pakistan⁶

Figure 3 presents the relationship between remittances and poverty in Pakistan. We can observe a negative relationship between remittances receipts and the macro poverty levels in

⁶ Graph covers a time period up to 2006 only because the data on poverty rate for a continuous period with a consistent poverty line definition is not available for the later period.

Pakistan over the large part of the graph. Along the increase in remittances, poverty rate is declining annually at smooth rate and there are no jumps in poverty rate. We expect to see a similar negative relationship between foreign remittances and poverty rate in our analysis at the household level.

3. Literature review

There is a rich literature available on the relationship between remittances and poverty levels globally. Analysis has been carried out both at the micro and macro levels. In case of Pakistan, a number of studies are available that examine the impact of remittances on macro variables including poverty; however the literature on micro level impacts of remittances is quite scant.

3.1 Macro level studies

Adams (1991) using Household survey 1986 & 87 estimates that international remittances have a small but positive, effect on poverty levels in rural Egypt. Poverty-line calculations indicated that the number of poor households decline by 9.8 percent when predicted per capita household income includes international remittances.

Adams and Page (2003) using data from 71 developing countries find that a 10 percent increase in the share of remittances in developing countries' GDP can lead to about 1.6 percent decline the poverty headcount on average.

Miambo and Ratha (2005) analyze the impact of international remittances on poverty using a growth-poverty model for south Asia. The estimated results conclude that remittances of both types either official or unofficial reduce the poverty levels in these countries.

Kalim and Shahbaz (2009) using time series data for Pakistan between 1973 to 2006 and employing Co-integration analysis suggest that poverty has positive association with FDI,

inflation, tax and initial trade openness while it has negative relationship with remittances, GDP per capita, and urbanization.

Jongwanich (2007) estimate the impact of Workers' Remittances on Economic Growth and Poverty in developing Asia and the Pacific countries using panel data from 1993 to 2003. Results indicate that remittances seem to have a positive but marginal impact on economic growth in these countries through the enhancement of domestic investment and human capital consumption. However, Remittances have direct impact on poverty reduction by increasing household income and smoothing consumption.

Banga and Sahu (2010) estimated the impact of remittances on poverty in 77 developing countries using panel data from 1980 to 2008. Using three stage least squares estimation procedure (3SLS), outcomes show that for the given level of GDP, a 10 percent rise in remittances can potentially cause a reduction of 3.9 percent in poverty headcount ratio. The associated reduction in poverty gap in developing countries with this increase in remittances could be between 3- 3.5 percent.

Qayyum et al. (2007) study the long run relationship between remittances and poverty in Pakistan. Using time series data, co-integration and other diagnostic tests reflect that international migration of labor has considerable benefits for poor in Pakistan. In the long run remittance inflow can leads to sustainable growth and up-gradating of poor households. Similarly, Irfan (2011) evaluates Remittances and Poverty Linkages in Pakistan using time series data from 1975 to 2009. Results suggest that remittances have significant impact on poverty alleviation.

Javid and Qayyum (2012) evaluate the impact of remittances on poverty and economic growth in Pakistan using time series data during 1973-2010. Results find that remittances have

very strong and statistically significant relation with economic growth and poverty reduction in Pakistan.

3.2 Micro level studies

Suleri and Savage (2006) study the role of remittances in the post crisis situations. Using primary data; assembled through interviews after the earth quake in Pakistan, results from the study show that the households that also receive remittances are less vulnerable to the effects of the crisis.

Gerardo and Pineda (2006) used Mexican Household survey data to study the impact of foreign remittances on poverty levels. Results derived from Propensity score matching technique (PSM) suggest that receiving remittances from abroad reduces the probability of being in food-based and capabilities-based poverty in Mexico up to 8 and 6 percentage points respectively.

Koc and Onan (2001) estimate the effects of remittances on poverty at the local level in Turkey. Results find that 12% of households use about 80% of remittances to improve their standard of living.

Siddiqui and Kemal (2006) using input output table of 1989-1990 and Households data of 1993 for Pakistan estimate the relationship between remittances, trade liberalization and poverty in Pakistan. Results find that a decline in remittances leads to an increase in poverty level. Trade liberalization also reduces poverty but its effects are more pronounced in urban areas compared to the rural areas.

Rajan and Zachariah (2007) use primary data On Kerela (an Indian state) and find that recipient families spend a high proportion of their remittances on housing and education in Kerala.

Saleem and Aslam (2007) explore the socio-economic impact of foreign remittances on households in four villages of Tehsil Summundri, Pakistan. Primary data results point that income from remittance sources is mostly being spent on meeting basic needs, purchasing property, business and on repayment of the debt.

Chukwuone (2007) evaluates the impact of remittances on poverty and inequality in Nigeria using Nigerian national living standard survey of 2004. The results of empirical study indicate that at one hand remittances create income inequality and social differentiation and on the other hand arrange for powerful contribution in vulnerability and poverty reduction among the households.

Arif (2009) evaluated the poverty status of households after receiving remittances and concludes that the level of poverty among recipient households is considerably lower, and there is a marked difference between pre and post-migration perceived economic status.

Sarfraz et al. (2009) evaluate the role of remittances in improving living standard of the of emigrants families in District Gujrat (Pakistan). Results of survey based study show that an extensive change occurs in all of the household accessories and facilities. Most of the emigrant families improved their social status as well as the living standards after receiving remittances.

Ahmed et al. (2010) estimate the effect of remittances on household welfare in Pakistan. Using Household data for 2005-06, the results from computing general equilibrium (CGE) model suggest that poverty decreases by 7.8% if the households receive remittances from abroad. Poverty gap and poverty severity decline by 11.5 percent and 14.9 percent respectively as a result of foreign remittances.

Muhammad et al. (2010) suggest that remittances contribute positively to the socio-economic conditions of recipient families. By improving their life style, medium of schooling of

children, purchasing landholdings and new brand vehicles, constructing cemented houses and investing in real estate.

4. 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 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 program and conditioned on the observable characteristics (World Bank, 2009).

We adopt PSM technique for impact evaluation mainly because of the paucity of the data. We do not have before and after data for remittances receiving households therefore regression based standard difference-in-difference (DID) models cannot be employed. An application of DID models in the current context can produce biased results (Khan, 2008).

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 , of the study is a binary variable, coded as 1 if the household receives remittances and zero otherwise.

$$ATET = E[Y(1) - Y(0) | D = 1] = E[Y(1) | D = 1] - E[Y(0) | D = 1]$$

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 : $P(X) = \Pr(D = 1 | X)$.

In matching based scores, outcomes of treated and control groups are compared based on single index $P(X)$ instead of all variables in X .

4.1 Assumptions

There are two assumptions for the identification of the program and four alternatives methods for impact evaluation. The assumptions include conditional independence and presence of the common support.

4.1.1 Conditional independence

Conditional independence is a strong assumption; according to which the observable characteristics (which are not affected by program) determine the program participation but

include only those observable characteristics that remain unaffected by the treatment. $P(X)$ is independent of the treatment so the following situation should be satisfied.

$$Y(0), Y(1) \perp D/X$$

Here \perp sign shows the conditional independence. But if unobserved characteristics determine program participation, conditional independence will be violated, and PSM will not be an appropriate method.

4.1.2 Common support or overlap condition

Second assumption is called common support or overlap condition. This implies that treatment observations have comparison observations in the propensity score distribution. This is basically the region where positive density of balancing score occurs for both the treated and control group. PSM depends on having large and roughly equal number of participants and nonparticipants so that the area of common support can be found. This assumption requires the fulfillment of condition that

$$0 < P(D = 1) < 1$$

Households which do not satisfy the overlap condition are excluded.

4.2 Methods used for propensity score matching

Different matching methods can be used for comparison of participants to non-participants on the basis of propensity matching score. The methods are nearest neighbor matching (NN), Caliper or Radius matching (RM), Stratification or Interval matching (IM) and kernel matching (KM).

4.2.1 Nearest neighbor matching

NN is the most frequently used technique, in which every treatment unit is matched with its closest propensity score unit. Every treated unit can be matched with one or more control units.

If matching is based on one control unit it causes to minimize bias and increases variance. Matching which include more than one nearest neighbor increase the bias and decrease variance. Matching can be done with or without replacement. However without replacement process has an advantage that it results in a low variance. In NN matching, there can be a problem of high difference in propensity score of participants and non-participants, which can cause poor results.

4.2.2 Caliper or Radius matching

The problem of poor results can be avoided by using caliper matching. This is a variation of NN and drop out bad matches because it involves only matching with replacement within a certain range. But due to dropping out of the participants the chance of sample bias occurs.

4.2.3 Stratification or Interval matching

Interval matching calculates the program's effect by using intervals. "Interval is a time or space between two periods or objects". Within each interval, the program effect is counted by the mean difference in outcomes between treated and control observations. To each interval, average weights are assigned and share of each participant is measured according to given weights.

4.2.4 Kernel matching

Under Kernel matching all participating units are matched with weighted average of all control units (non-participants). All the observations in the treated group which are inside the common support area are used while outside variables are excluded. Weights used are inversely proportional to the difference of treated unit from the control unit.

4.3 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 expenditures⁷. 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 international remittances separately. However in this study, data only on international remittances have been used to carry out the analysis. It can be observed from table 2 that about 5 percent of the households in the dataset receive 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 2: 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

Source: Author's calculations

Figure 4 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.

⁷ Income here includes income from both the primary and secondary sources. This includes income from salaries, earnings from business/agriculture, pensions, and returns on investments, cash transfers in the form of Zakat and remittances (both internal as well as foreign remittances) etc.

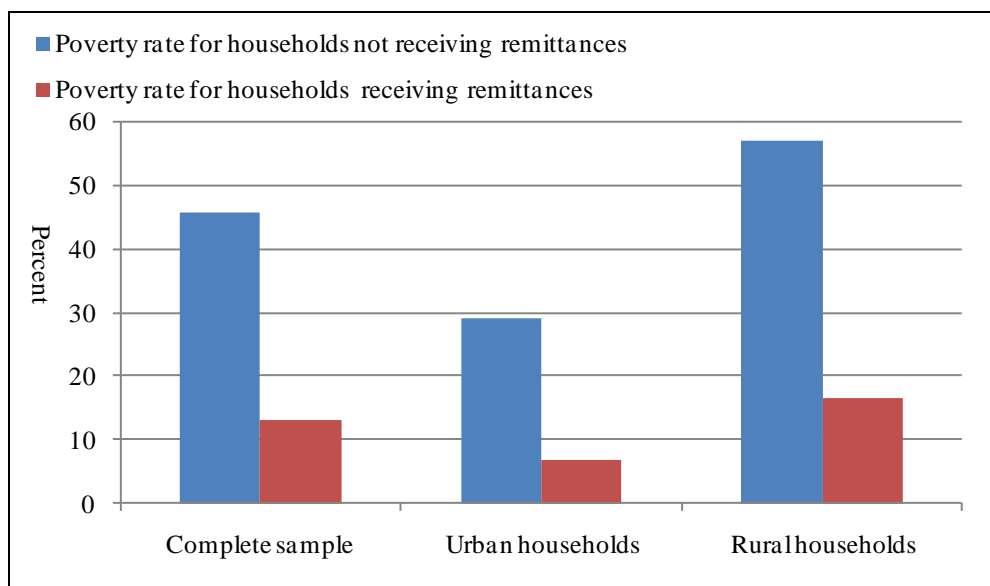


Figure 4: Percentage of households below poverty line viz-a-viz remittances

Table 3 presents the summary statistics of the data employed for the analysis. There are no significant differences between the rural and urban households in household specific variables except the education level of the household head and the household size. The household heads from urban areas are more educated than the household heads in the rural areas. Similarly, the family size in urban areas is smaller than the family size in the rural areas. For household receiving remittances, average income is a little more than two times higher than the average income of households that do not receive remittances. This ratio is even higher at 2.4 times for the case of rural households.

The impact of remittances becomes more evident when we compare the incomes of the households with remittance income and without remittance income. The income of the households that receive remittances is more than double the income of the households that do not receive remittances. This ratio becomes even higher for the case of rural households.

Table 3: Descriptive statistics

	Complete sample				Urban households				Rural households			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
No. of adult females in household	2.35	1.586	0	15	2.422	1.655	0	12	2.302	1.535	0	15
No. of adult family members with primary education	0.424	0.909	0	9	0.413	0.912	0	9	0.431	0.907	0	9
Dummy for landline phone connection	0.21	0.407	1	0	0.329	0.47	1	0	0.129	0.335	1	0
Dummy for gas connection	0.316	0.465	1	0	0.678	0.467	1	0	0.072	0.258	1	0
Dummy for electricity connection	0.887	0.316	1	0	0.986	0.118	1	0	0.821	0.384	1	0
Dummy if the residence is a personal property	0.861	0.346	1	0	0.758	0.428	1	0	0.931	0.254	1	0
Age of household head	45.964	13.418	10	99	45.978	12.742	12	99	45.905	13.857	10	99
Education level of household head	8.667	3.837	0	23	9.663	3.976	0	23	7.974	3.583	1	23
Gender of household head (Male =1)	0.208	0.465	0	1	0.227	0.481	0	1	0.204	0.453	0	1
Household size	7.951	2.84	2	61	7.766	2.757286	2	37	8.076	2.889	3	61
Annual household income excluding remittances (Pak Rs.)	123828.4	129303.2	200	10200000	161767.8	216807.4	300	7524000	98330.48	157303	200	10200000
Annual household income including remittances (Pak Rs.)	129202	186261.7	200	10200000	166572.5	223414	600	7524000	104089	163290.8	200	10200000
Annual per capita income (Pak Rs.)	16762.	22966.	37.636	1254000	22556.15	30808.35	86	1254000	12842.57	14289.62	37.63636	510900
Annual income of the households that receive remittances (Pak Rs.)	269651	255208	18600	2470000	344488	337867	42400	2470000	235343.6	197860.6	18600	1344000
Annual income of the households that do not receive remittances (Pak Rs.)	123884	187337	200	10200000	161260.9	216895.1	600	7524000	98250.79	159029.4	200	10200000

For developing a deeper understanding of poverty dynamics and observe the impact of remittances on poverty, we further investigate whether remittances affect household income across all the income groups in a similar fashion. Therefore the distribution of income deciles is plotted across those households that receive remittances versus the households that do not receive remittances.

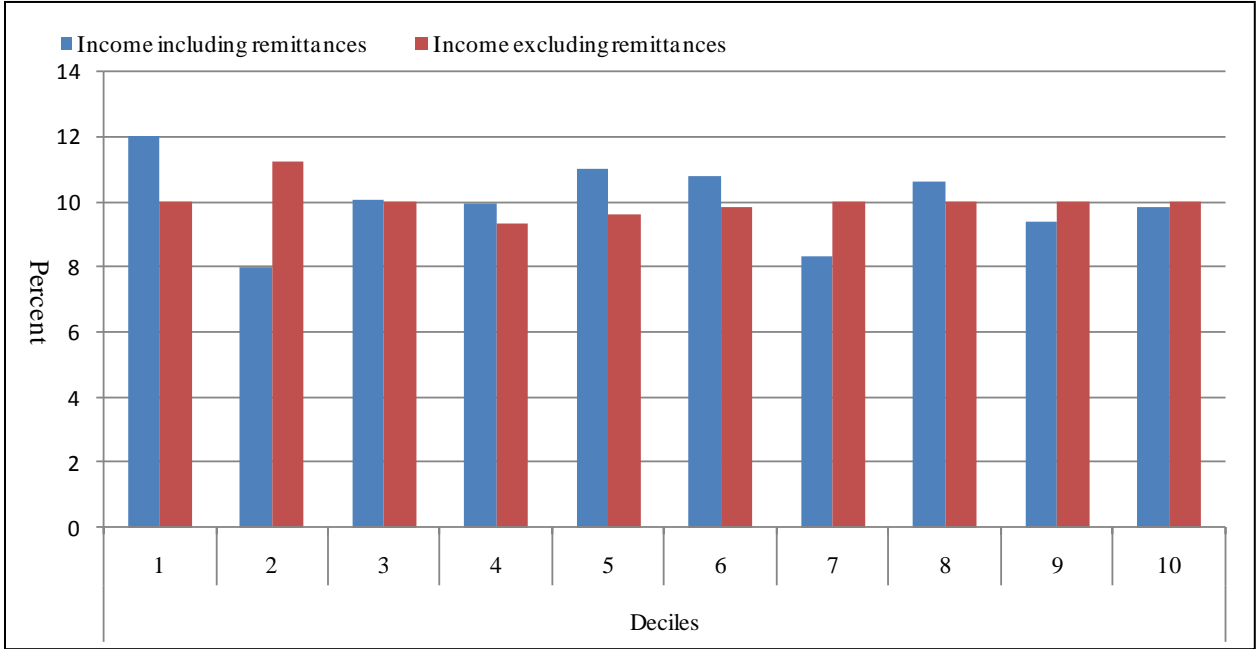


Figure 5: Deciles of households with and without remittance income

In figure 5 we have plotted the deciles of total household income excluding remittances and the household income including remittances. Figure suggests that in most of the cases the distribution of households along income groups has remained the same whether we include income from foreign remittances in the analysis or not. In more of the cases, remittances increase the incomes of all household groups. This trend is especially more pertinent in the case of low and the middle income groups with the exception of the second decile.

Although figure 5 seems to suggest that incomes of the households would not have been significantly affected even in the absence of foreign remittances in Pakistan; we cannot make this inference only on the basis of this diagram as we do not observe the counterfactual nor do we have data to develop such benchmarks. Otherwise, we could have compared the household income in the presence of the remitter outside the country compared to the household income in the absence of the remitter.

However, uniform distribution of remittance income across all income groups conveys information on two different aspects of the relationship between remittances and poverty in Pakistan. First, migration from Pakistan is not income group specific and remitters belong to all different income strata. This is contrary to the submissions of Khan (2008) that migrants might belong to higher income groups because migration process itself is costly. Second, poverty is prevalent even in the presence of remittance income. It highlights that remittance income might not always reduce poverty and therefore requires an elaborated investigation from the perspective of developing countries. These trends also amplify our pertinent question whether remittances increase the probability of households coming out of poverty or not.

5. 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.

Table 4: Probit Estimates

<i>Dependent Variable: Dummy variable for households receiving remittances</i>						
	Complete sample		Urban Households		Rural Households	
	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	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-05	-6.98E-05	0.0002	0.0001	0.0001
Education squared	-0.0018	0.0009	-0.0048	0.0017	0.0003	0.0011
Age squared*Education of household head	3.05E-06	3.56E-06	9.52E-06	6.37E-06	-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 education	-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 property	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	

Source: Author's calculations

Table 4 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 receive treatment (receive remittances). Propensity scores are then used to estimate the average treatment effect on treated.

Table 5 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 percent⁸ when we compare it to the per capita income of the households that do not receive remittances⁹. 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.

Table 5: Average treatment effects of foreign remittances under alternative matching schemes

<i>Outcome variable: Per capita income</i>						
	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
<i>Outcome Variable: Poverty</i>						
	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

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

⁸ 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.

⁹ 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.

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 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 counterparts. 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 households¹⁰. 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.

6. Concluding Remarks

In this study, 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

¹⁰ For details see PBS (2008) pp. 8

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.

References

- Adam, R.H. Cuecuecha, A. and Page, J. (2003). International Migration, Remittances and Poverty in Developing Countries. *World Bank Policy Research Working Paper 3179*, Washington, D.C.
- Adams, R.H. and Cuecuecha, A. (2010). Remittances, Household Expenditure and Investment in Guatemala. *World Development*, doi:10.1016/j.worlddev.2010.03.003.
- Adams. (1991). The Effects of International Remittances on Poverty, Inequality, and Development in rural Egypt. *Research Report No.86*, International Food Policy Research Institute, Washington, DC.
- Ahmad, V. Sugiyarto, G. and Jha, S. (2010). Remittances and Household Welfare: A Case Study of Pakistan. *ADB Economics Working Paper Series No. 194*. Asian Development Bank.
- Andersson, A. (2012). Migration, Remittances and Household Welfare in Ethiopia. *unpublished manuscript*, University of Gothenburg.
- Arif, G.M. (2010). *Economic and Social Impacts of Remittances on Households: The Case of Pakistani Migrants Working in Saudi Arabia*. International organization of migration, Geneva.
- Banga, R. Sahu, P.K. (2010). Impact of Remittances on Poverty in Developing Countries, *unpublished manuscript*.
- Chukwuone, N. (2007). Analysis of impact of remittances poverty and inequality in Nigeria. *6th pep research network general meeting, Peru*.
- Cox-Edwards, A. and Rodriguez-Oreggia, E. (2009). Remittances and Labor Force Participation in Mexico: An Analysis Using Propensity Score Matching. *World Development Vol. 37,1004–1014*.
- Esquivel, G. and Pineda, A.H. (2007). Remittances and poverty in Mexico: a propensity score matching technique. *Integration and trade.27*, 45-71.
- Irfan, M. (2011). Remittances and Poverty Linkages in Pakistan: Evidence and Some Suggestions for Further Analysis. *PIDE working paper 2011:78*. Pakistan institute of development economics Islamabad.
- Javid, M. Arif, U. and Qayyum, A. (2012). Impact of remittances on poverty and economic growth in Pakistan. *Academic Research International*.
- Jongwanich, J. (2007). Workers' Remittances, Economic Growth and Poverty in Developing Asia and the Pacific Countries. UNESCAP working paper WP/07/01, United Nations.

- Kalim, R. and Shahbaz, M. (2009). Remittances and Poverty Nexus: Evidence from Pakistan. *International Research Journal of Finance and Economics*.**29**, 46-59.
- Kapur, D. (2004), "Remittances: the New Development Mantra?", *G-24 Discussion Paper Series*, Nr. 29, United Nations Conference on Trade and Development, April.
- Khan, M.W.R. (2008). The Micro Level Impact of Foreign Remittances on Incomes in Bangladesh: A Measurement Approach Using the Propensity Score. *Discussion paper*, Centre for policy dialogue Bangladesh.
- Khan, S. Sajid, M.R. Gondal, M.A. Ahmad, N. (2009). Impacts of Remittances on Living Standards of Emigrants' Families in Gujrat-Pakistan. *European Journal of Social Sciences*, **12**, 205-215.
- Koc, I. and Isil O. (2001). The Impact of Remittances of International Migrants on the Standard of Living of the Left-behind Families in Turkey. Hacettepe University Institute of Population Studies.
- Miambo, S.M. and Ratha, D. (2005) *Remittances: Development Impact and Future Prospects*. World Bank, Washington.
- Muhammad, N. Ahmad, M. Ahmad, N. Shah, M. Alam, I. Jawad, M. (2010). The impact of foreign remittances on the socio economic conditions of households. *Sarhad J. Agric.* **26**, 141-145.
- Munir, K. Rahim, T. Bakhtiar, Y and Nawab, B. (2007). Remittances as a Determinant of Consumption Function: Empirical Evidence from Pakistan). *Sarhad J. Agric.***23**, 1195-1198
- Pakistan Bureau of Statistics (2010). Statistical handbook of Pakistan. Ministry of economic affairs and statistics, statistics division, Islamabad.
- Pakistan Bureau of Statistics (2008). Household Integrated Economic Survey of Pakistan. Ministry of economic affairs and statistics, statistics division, Islamabad.
- Qayyum, A. Javid, M. Arif, U. (2007). Impact of Remittances on Economic Growth and Poverty. *Working paper*, Pakistan Institute of Development Economics.
- Rajan, S.I. and Zachariah, K.C. (2007). Remittances and its impact on the Kerala Economy and Society. *Unpublished manuscript*, Institute of Social Studies, The Netherlands.
- Rosenbaum, P. and Rubin, D.B. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects, *Biometrika*.
- Rosenbaum, P. and Rubin, D.B. (1985) Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score," *The American Statistician*, **39**, 33-38.

- Saleem, M.W. Aslam, R. (2007). Socio Economic Impact of Foreign Remittance on Household in Rural Areas of Pakistan, *unpublished manuscript*.
- Samuel. M. M. & Dilip. R. (2005). Remittances: Development Impact and Future Prospects. *World Bank, Washington, D.C.*
- Shroff, K. (2009). Impact of Remittances on Poverty in Mexico. *Working paper. Global Citizenship Conference & Hewlett Foundation.*
- Siddiqui, R. and Kamal, A.R. (2006). Remittances, Trade Liberalization and Poverty in Pakistan: The Role of Excluded Variables in Poverty Change Analysis. *PIDE Working Paper No. 2006/1*, Pakistan Institute of Development Economics, Islamabad.
- State Bank of Pakistan (2011). State of the Pakistan Economy, SBP Karachi.
- Suleri, Q.A. and Savage, K. (2006). Remittances in crisis: a case study from Pakistan. *HPG background paper*, overseas development institute.
- World Bank. (2012). Migration and brief. *Migration and remittances unit, Development prospects group.*
- World Bank. (2010). World development indicators. World Banks group, Washington.
- World Bank (2011). World Bank fact book. World Banks group, Washington.