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**Centre d'Analyse Théorique et de  
Traitement des données économiques**

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**REMITTANCES, INEQUALITY  
AND POVERTY IN PAKISTAN:  
MACRO AND MICROECONOMIC  
EVIDENCE**

**Mazhar MUGHAL  
Amar Iqbal ANWAR**

# **Remittances, inequality and poverty in Pakistan: macro and microeconomic evidence**

**Mazhar Mughal<sup>†</sup> and Amar Iqbal Anwar<sup>††</sup>**

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## **Abstract**

This paper studies the impact of remittance incidence on inequality and poverty in Pakistan. Using the 2005-06 and 2007-08 Household Integrated Economic Survey data, we find that remittances substantially lower the poverty headcount, as well as the depth and severity of poverty. Foreign remittances have also a beneficial effect on economic inequality in Pakistan. The contribution of foreign remittances in poverty alleviation and inequality reduction is much stronger than that of internal remittances. Time series analysis for the period 1979 – 2007 suggests that among the three main remittance-sending regions, remittances from North America have the strongest equalizing effect in Pakistan.

**Keywords:** Remittances, inequality, poverty, Pakistan, South Asia

**JEL Codes:** O10, O15

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## **Introduction**

Remittances from overseas Pakistanis have grown spectacularly in the last decade, rising from under \$1 billion in 2000 to over \$12 billion in 2011 (State Bank of Pakistan 2012). These inflows today make up over 6 percent of Pakistan's GDP, and constitute the country's largest annual financial inflow. Surprisingly, there is little recent research on the economic impacts of remittances, given their significance in the national economy. Their impact on the poverty and economic disparity particularly needs attention.

Earlier studies on the development aspects of Pakistan remittances have found mixed results. Lucas (2005), for instance, suggest an equalizing and poverty-alleviating impact of remittances to Pakistan, given that international migration from Pakistan has mainly been from the disadvantaged households of the rural areas. In a CGE analysis of trade liberalization policies of Pakistan, Siddiqui and Kemal (2006) demonstrate that the decline in remittance inflows is a major contributory factor in explaining the increase in poverty in Pakistan during the 1990s.

On the other hand, in their pioneering study on migration from rural areas of Pakistan, Gilani et al. (1981) found an inequality increasing effect of international remittances. Similarly, Adams (1998) determined that even though poverty in rural Pakistan may have dropped as a result of international migration, the inability of the poorest households to participate in the process may have led to an increased economic disparity. Remittances, according to his analysis, make up only 1 % of the poorest 20 % rural households' income, while for the richest households, the share rises to 14 %. In contrast, in an earlier study, he showed that remittances had a neutral effect on income distribution as they were distributed fairly equally through the income order (Adams, 1992). Likewise, Ilahi and Jafarey (1999) show that in Pakistan, the returns of international migration are shared across non-migrant households. This may cause the overall rate of inequality to rise or fall, depending on the initial location of the households in the income distribution, even though poverty may inevitably be reduced.

This paper brings new evidence of the developmental impacts of remittances. We use the 2005-06 and 2007-08 Household Integrated Economic Surveys (HIES) for this purpose. Besides, long-run effects of remittances on poverty and inequality are studied. We also consider remittances to Pakistan from the world regions with major concentrations of Pakistani migrants, and examine their impact on inequality of income and consumption as well as poverty in the country. To the best of our knowledge, this is the first study of international remittance flows to Pakistan using region-wise and time series remittances data.

## **Hypotheses tested and research questions**

We seek to test the following hypotheses.

### **H1. Remittances to Pakistan alleviate poverty.**

A high proportion of Pakistani immigrants, especially those in the Gulf States, have historically been low or semi-skilled workers, who have come from poor households. The money these workers sent must therefore help their families back home in coming out from poverty. The impact of remittances from educated migrants to their well-off families should also be welfare-improving. This is because whether through investment or investment-like consumption (e.g. home-building and real-estate), or through consumption of domestic products and services, remittances provide jobs to many. This, in our view, should have a strong poverty-reducing effect in a country where underemployment and unemployment are

rampant. Similarly, if remittances are spent on the education of the household members, the resulting human capital accumulation should ultimately also lead to better skills and lower poverty.

## **H2. Remittances from North America increase inequality in Pakistan.**

Pakistani Diaspora in Canada and the United States mostly comes from upper-middle and high income background. Besides being highly educated<sup>1</sup>, emigrants to North America have been the highest earners among all groups of Pakistani migrants, their average income being even higher than the average U.S household income<sup>2</sup>. Therefore, such brain drain remittances inflows from North America should exacerbate disparities, both in absolute and relative terms.

## **H3. Remittances from the Middle East and Europe have an ambiguous impact on inequality.**

Compared to North American migrants, Pakistanis in the Persian Gulf and Europe (mainly the U.K.) a relatively heterogeneous group. Migrants to these countries have included unskilled and semi-skilled labour as well as doctors and engineers. The impact of remittances from the Middle-East and Europe is therefore hard to determine. Nevertheless, given that migrants to these regions have mostly come from low-income households in rural areas, these remittances may reduce income inequality in the country.

## **H4. Remittances have an ambiguous impact on inequality.**

The net impact of remittances on inequality cannot be judged a priori, and depends on the cumulative effect of remittances from the three migrant-sending regions. Given that altruism is probably the dominant motive behind remittances to Pakistan (Anwar and Mughal, 2012), remittances should improve the income and consumption levels of the low and middle-income recipient households, thereby reducing overall level of inequality. However, the skill composition of migration from Pakistan is evolving, as more and more skilled and highly qualified Pakistanis immigrate (Kock and Sun, 2011). These migrants are usually from the middle or upper income groups, and the money they send should therefore increase the disparities further. Consequently, the aggregate impact of remittances on inequality depends on which of these inequality reducing and enhancing effects dominates.

We find that remittances to Pakistan have a substantial impact on the incidence, depth and severity of poverty in the country. The impact on overall inequality is likewise salutary. Among region-wise inflows, remittances from North America are found to reduce inequality most strongly.

In the coming sections, we detail these findings and elaborate the datasets used. We begin by a brief description of the state and evolution of remittances, poverty and inequality in Pakistan. In section 3, we present our microeconomic study, followed by the time series analysis in section 4. Section 5 concludes and discusses policy implications of our main findings.

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<sup>1</sup> The 2005 American Community Survey undertaken by the US Census Bureau shows that among the male Pakistani population aged 25 years and over, 60.9% had bachelor's degrees or higher while the American average for the same category was 28.5% (Oda, 2009). In contrast, tertiary enrolment rate in Pakistan is hardly 5 percent.

<sup>2</sup> In 2005, the mean and median incomes for Pakistani male full-time workers in the United States were \$59,310 and \$42,718 respectively, while those for American male full-time workers were \$56,724 and \$41,965 (Oda, 2009).

## **2. Remittances, inequality and poverty in Pakistan: an overview**

### **2.1. Remittances**

In 1970-71, Pakistan received less than \$50 million in the form of remittances. From such meager sums, the remittances flows grew beyond \$12 billion in the year 2011. Today, Pakistan is one of the top ten remittances-receiving countries. Remittances make up over 5 % of the GDP, which compares favorably with many developing countries (figure 1).

The United States, Saudi Arabia, United Arab Emirates, the United Kingdom and the Gulf states of Kuwait, Qatar, Bahrain and Oman are the major sources of remittance flows. Official remittances have often exceeded other sources of foreign exchange for the country (figure 2).

Remittances to Pakistan first picked up in the 1970's, when the construction boom in the Persian Gulf engaged millions of Pakistani temporary migrants. Remittances from these migrants peaked in early 1980's, when they surpassed exports as the biggest source of foreign capital, constituting as much as 10 % of the country's GDP. These flows slowed down during the cheap oil period of late 1980's and the 1990's with the weakening of Arab economies. The Gulf war in the early 1990's also had a dampening effect on remittances. The second and ongoing phase of growth in official remittances began in the aftermath of the tragic events of September 11, when in the financial year 2001-02, remittances to Pakistan more than doubled. This ongoing phase has seen a sharp and sustained rise in remittance inflows from all the major concentrations of Pakistanis around the world. Remittances from the United States have risen the most, from a mere \$73.3 million in 2000 to over \$1.7 billion in 2008-09. Even though the pattern of official remittance inflows to Pakistan is procyclical, remittances to Pakistan have indeed risen at the time of natural catastrophes. Many victims of the October 2005 earthquake in northern Pakistan were able to get back on their feet thanks to financial support from the Pakistani diaspora (Suleri and Savage, 2006).

Formal remittances however merely represent the tip of the iceberg. Unofficial flows of remittances could be as much as 50% of the recorded flows (World Bank, 2006), or potentially adding as much as 75% to the official receipts of the developing countries (Freund and Spatafora, 2005). The sharp rise of remittance flows to Pakistan since 2001-02 can partly be attributed to curbs on informal remittance-transferring channels, known as Hundi or Hawala. Other reasons include panic transfers in the immediate aftermath of the 9 11 attacks, the maturing of Pakistani Diaspora in North America and the European Union, increase in the number of Pakistanis abroad, reduction in the cost of remitting, changing skills profile, and the desire to avail the opportunities offered by an expanding economy during the 2000s. Overseas Pakistanis are thought to have substantially participated in the record rise of Karachi Stock Exchange (KSE), the country's prime stock market<sup>3</sup>, as well as in the real-estate boom.

Available evidence suggests that much of the remittances to the country are spent on consumption. In an early study of remittances in Pakistan, Gilani et al. (1981) found that over three-fifths of the remittances were spent on consumption. Part of this consumption spending goes on education and health, with a gender-equalizing effect in education (Mansuri, 2007). To the extent the remittances are saved and invested, they are associated with higher farm

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<sup>3</sup> The KSE rose from 1,247 points shortly before the September 11 attacks to over 15,000 points in early 2008 (Oda, 2009).

productivity owing to increased spending on farm equipment (Kerr, 1996). In rural Pakistan, the propensity to save out of remittance receipts appears to be much higher than that for other income sources (Adams, 1998; 2002). Remittances should thus have a positive role in reducing poverty in the country.

## **2.2. Inequality and poverty**

Inequality in Pakistan manifests itself not only at the individual and family level, but also in its geographical and temporal dimensions. As an example of the inequality of opportunities, literacy rate on the district level, according to a 2007 estimate, varied from over 70% in Islamabad to 10% in Musa Khel and Kohistan. In Pakistan, economic inequality has not been extreme, with the Gini index for income and consumption ranging in the 30's for much of its history (figure 4). Even though the country lies in the middle of the pack, inequality in the country has nevertheless fluctuated significantly. Income inequality (expressed in terms of Gini index) has grown from around thirty in the 1960's to over 40 in the 2000's. Possible reasons for this secular rise include overemphasis on growth at the cost of equity in the 1960's, trade and capital account opening in the 1990's, persistent food and fuel cost inflation and indirect taxation that disproportionately hurt the poor, as well as the government policies that promoted industrialization and urban development to the detriment of agriculture and majority rural population.

Poverty, on the other hand, has treaded a different trajectory. It sharply fell from over 70% in the 1960's to 20% in 1990, from when onwards; it has been on the increase (figure 5). The first phase of poverty reduction was associated with the green revolution and steps towards industrialization in the 1960's, which even though made the rich richer, did provide many poor with better earning opportunities. In the 1970's and 80's, the migration of up to 2 million Pakistanis, often semi and unskilled workers from poor rural background, also contributed to the reduction in poverty. From the 1990's however, debt servicing of the loans incurred from the international lenders, along with high Defense spending due to insecurity on the eastern borders left little to be potentially spent on poverty alleviation. Political instability, corruption and nepotism also hindered the judicious use of development funds. In the 2000's, despite the revival of economic growth and sharp rise in remittances and FDI's, poverty has not abated. This could possibly be due to the services and capital-intensive industry led growth and the ensuing double-digit inflation. The ongoing geopolitical instability and recurring natural disasters during the decade have worsened the situation.

## **3. Microeconomic Analysis**

**In the next section, we empirically examine the relationship between poverty and inequality in the country and the transfers from abroad.**

### **3.1. Data and estimation method**

The data in this study are taken from the Household Integrated Economic Survey (HIES) 2005-06 and 2007-08. This series of nationwide representative surveys, conducted as phase II of Pakistan Social and Living-Standard Measurement (PSLM) survey, comprises of observations for over fifteen thousand households in each survey. According to the 2007-08 HIES, 4.3 percent of the population receives foreign remittances, while 8.4 percent households receive domestic remittances. Both income and consumption observations are

available in the survey data. However, we rely on consumption data for constructing our poverty and inequality indicators. One reason for this preference is that consumption is less subject to short term economic shocks. Moreover, in developing countries, the presence of a large informal sector and large scale tax evasion means that incomes are underestimated. This causes income inequality to be on the lower side. Besides, in a country where close to half the population depends, directly or indirectly, on agriculture for its income, vagary of weather can cause incomes to vary substantially. Consumption, in comparison, is less prone to short-term shocks, and can therefore give a better picture of inequality at a given point of time. Consumption can also be deduced and estimated with less error. Besides, official poverty line in many developing countries, including Pakistan, is based on the minimum required caloric intake monetized to give individual consumption figures. Therefore, basing the inequality measure on consumption makes the analysis of poverty and inequality coherent.

We use the official poverty lines of Rs. 11333 (Ul Haq et al. 2008) and Rs. 11400<sup>4</sup> for the years 2005-06 and 2007-08 respectively to construct the three binary variables for poverty. These three variables are the headcount poverty rate, the poverty gap and the squared poverty gap. The first corresponds to the proportion of the population below the poverty line; the second measures the total shortfall of consumption below the poverty line, while the last squares the poverty gap to estimate the severity of poverty. As regards inequality, we use Mean Log Deviation (MLD) as well as the five consumption quintiles. Our baseline poverty and inequality equation can be given as:

$$\text{Explained} = \beta_0 + \beta_1 \text{forrem} + \beta_2 \text{hhsiz} + \beta_3 \text{femalehead} + \beta_4 \text{nworker18} + \beta_5 \text{age} + \beta_6 \text{married} + \beta_7 \text{enrollmentstatus} + \beta_8 \text{lninc} + \beta_9 \text{lnsavings} + \beta_{10} \text{region} + \beta_{11} \text{province} + \varepsilon$$

Where  $p_0$ ,  $p_1$  and  $p_2$  are the three explained poverty variables and  $mld$  and  $q_1 - q_5$  are the explained expenditure inequality variables. The independent variables included in the equations control for household income and wealth, demographic, local and geographical features. Household size has a direct effect on poverty and inequality. Female fertility ratio tends to be higher among the poor households. Large households, therefore, are often poorer and less educated. This effect is checked if the number of at-work adults is correspondingly high. The marital status of the household head also affects the probability of being poor. People usually marry and form a household once they begin work and earn a living.

Another factor determining the incidence of poverty is the level of education. More educated individuals and households have better earning opportunities, and are therefore, less likely to be poor. Education also impacts inequality significantly (Mughal and Diawara 2011). The education indicator in our model is a dummy variable taking the value of 1 if the individual has ever gone to school or is currently enrolled in one. This variable is relevant in our context as 43 percent of the respondents in the 2007-08 HIES are found to have never gone to school (see table A1).

Household income is taken in logarithmic form for scalability purpose. Likewise, we take the logarithm of accumulated household savings as an indicator of wealth in our poverty and inequality equations. We also use agricultural land ownership as alternative indicator of wealth. The urban area dummy controls for the poorer, more unequal characteristic of the population, while provincial dummies consider the four provinces' diverse economic profile. Description of the above variables as well as their summary statistics are given in table A1 in

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<sup>4</sup> Taken from [http://www.finance.gov.pk/survey/chapter\\_10/09\\_Poverty.pdf](http://www.finance.gov.pk/survey/chapter_10/09_Poverty.pdf) (page : 141)

the appendix.

We also carry out the above mentioned model with internal remittances as the explanatory variable of interest.

The poverty headcount and consumption quintiles equations are estimated using Probit, given the dichotomous nature of the respective dependant variables, while the two remaining poverty equations as well as the Mean Log Deviation inequality models are estimated using the Ordinary Least Squares (OLS). All standard errors in our models are robust to heteroscedasticity.

### **3.2. Remittances and Poverty:**

Our 2007-08 dataset indicates a poverty headcount rate of 22.39 percent, which is 13.8 percent higher than the ones for recipient households (Table 1). The difference in the poverty depth and severity is also striking, the two indicators dropping from 5.36% and 1.95% (dataset with foreign remittances-receiving households excluded) to 2.27% and 0.077% respectively (dataset including foreign remittance-receiving households). The corresponding fall in poverty headcount rate, gap and squared gap for the 2005-06 dataset is also remarkable at 7.2%, 2.2% and 0.9% respectively.

Controlling for other drivers of poverty using the aforementioned equation, these strong poverty-alleviating effects are confirmed (see table 2). Foreign remittances show a strong and significant poverty reducing probability of 0.58 and 0.94 for 2007-08 and 2005-06 respectively, both significant at 1%. Only the urban-rural residence variable shows an equally strong probability. Remittances receiving households have a 18.4 percent marginal probability of being below the official poverty line *ceteris paribus*, as opposed to 30.1 percent for the non-recipient households (2007-08 results). The results pertaining to the depth and severity of poverty are similarly significant, and rival those of the household's rural-urban location. All the results on poverty are stronger in 2005-06 than in 2007-08.

The substantial reduction in the depth and severity of poverty can be explained by the fact that for all migrants, including the unskilled overseas workers, the rise in income arising as a result of migration is quite high as compared to the household income back home. These findings confirm our first hypothesis that foreign remittances significantly improve Pakistan's poverty situation.

Among other explanatory variables, household size appears to be positively associated with poverty, while number of workers and the person's education status show a significant negative relationship. Higher education logically brings better income and higher consumption, reducing poverty. In contrast, the age and marital status of the individual does not appear to significantly influence the household's poverty incidence.

We also estimate an alternative model taking agricultural land ownership as proxy for household wealth. The results (shown in table 3) are similar, with highly significant negative impact for all the three indicators of poverty. In this model, foreign remittances become the single most important factor behind the likelihood of the household being not poor. Foreign remittance-receiving households, for instance, appear to have a 24% and 32.9% lower marginal probability of being below the official poverty line in 2005-06 and 2007-08

respectively.

Table 3. Foreign Remittances and Poverty – alternative model

When compared with internal remittances (table 4), foreign remittances show a similarly strong association with the likelihood of being poor (baseline model). However, when agricultural land ownership is taken as proxy for household wealth, the relationship becomes weak and loses all statistical significance.

Table 4. Internal Remittances and Poverty

### 3.3. Remittances and Inequality

Households in our survey data have an overall consumption Gini index of 34.76 in the 2007-08 dataset, which is slightly above 33.54 for the sample excluding foreign remittance-receiving households (the corresponding figures for 2005-06 being 35.65 and 35.49 respectively). However, once other determinants of inequality are controlled for, we get a different picture (table 5). The coefficient for Mean Log Deviation is negative and significant at 1%, ranging from 0.30 (2005-06) to 0.32 (2007-08). Similar to the poverty results, foreign remittances appear to have the strongest association with consumption inequality after the household's residence in urban or rural area. Living in a particular province does not appear to be an important factor in determining the incidence of either poverty or expenditure inequality. The divide is rather mainly between the country's urban and rural areas, with urban areas being less poor and more equal.

Results given in Table 5 also show foreign remittances' association with the likelihood of belonging to different consumption quintiles. Foreign remittances are positively related to the upper quintiles, especially the top one, and negatively associated with the lower ones. Compared with these findings, domestic remittances show a rather weak negative association with consumption inequality (table 6), the coefficient being a low 0.07 (2007-08). This is also evident from the quintile-wise results, with internal remittances showing a significantly negative relationship with the probability of belonging to the bottom quintile and a significant positive one with the one above it, while the remaining three quintiles remain unaffected. This interaction of domestic remittances with inequality is markedly different from that of foreign remittances. The former appear to be evenly distributed in our sample, with 23 percent to be the highest share for any quintile. The reason for this difference is probably that unlike overseas Pakistani workers, internal migrants, particularly the poorest ones, do not earn enough to be able to move up the economic ladder.

The above results certainly give us some indications of the interaction between remittances and inequality. However, these are valid only as far as migrants and migrant households are considered as randomly drawn from the sample, without any selection bias. Remittance-receiving households may however not be randomly selected, and may differ from non-migrant households in such characteristics as motivation to work, ability and skills. These unobserved features might not only influence a household's likelihood of receiving remittances, but could also affect their earnings and consumption, and subsequently, the household's place in the consumption distribution. This can potentially bias our results. One way to check the randomness or not of the migrant households is to look at the figures of wealth inequality. Wealth accumulates over a matter of time, and thus reflects the household's previous earnings at a given instant. If the Gini index of wealth is lower for the sample

including foreign remittances as compared to the one without them, it will suggest that the migrants generally came from lower income groups. In our 2007-08 dataset, Gini index for agricultural land ownership, taken as a proxy for household wealth, drops by 0.6 from 91.6 to 91 when foreign remittance receiving households are included in the sample. Similarly, the Gini index of home ownership decreases by 1.6 points. The corresponding reduction in Gini index for 2005-06 is 0.75 and 1.38 points respectively. Similarly, Gini index for accumulated savings falls by a sizeable 11.1 points in 2005-06, from 70.4 to 59.3.

A more appealing way of dealing with the potential self-selection problem is by using the propensity matching technique (PSM). The method consists of matching persons from remittance-receiving households with those from non-remittance-receiving ones but similar observable characteristics (household size, female headship, education status, savings, urban or rural setting, and province of residence). First, the probability of receiving remittances given various household covariates is estimated using a probabilistic model such as probit. This gives us the propensity scores for observed covariates by ranking individuals from receiving and non-receiving households. From this, difference between labour participation of treated group (individuals from remittance-receiving households) and non-treated group (individuals from non-remittance-receiving households) is calculated. This difference is averaged out to give the Average Treatment effect on the Treated (ATT).

Table 7 gives the results of propensity score matching estimations using the Kernel estimator. We find that the upper two quintiles both have a negative average treatment effect and the three a positive one in both of our survey datasets. This goes to confirm our previous findings that foreign remittances make the consumption distribution more equal. The ATT for domestic remittances still show a muddled picture, with the first, third and fifth quintiles showing a negative sign and the second and fourth a positive one.

From these results, we can conclude that foreign remittances have indeed helped lower economic disparities in the country. Now that the positive role of foreign remittances with respect to poverty and inequality is established, we proceed to examine their sending-region-wise impacts.

#### **4. Macroeconomic Analysis**

In this section, we study the impact of remittances in the course of time. As shown in section 2, the pattern of aggregate and region-wise remittance flows to Pakistan has greatly evolved in the last three decades. Therefore, it is important to analyze their long-run impacts on inequality and poverty in the country.

##### **4.1. Data and Methodology**

###### **4.1.1. Data sources**

Household economic surveys are usually not conducted every year, and therefore the time series of income and consumption contain missing observations. Inequality figures for Pakistan are available from 1960s, while other annual aggregates are available from the year 1973. However, to the best of our knowledge, no inequality estimate exists for the years between 1972 and 1979. This seven years gap is large enough so much so that the missing data cannot be reliably interpolated. Any such attempt will bias the inequality trend downwards. Consequently, the period of study is restricted from 1979 to 2007-08.

Even though economic inequality can move in either direction relatively quickly following an economic shock (e.g. China in the last thirty years, or the ex-Communist countries of East and Central Europe during the 1990's), within-country inequality is normally considered a slow-moving variable. In Pakistan, inequality, as measured by consumption Gini index, remained in the range between 26 and 35 during the 29 year period from 1979 to 2007-8 examined in this section, with a standard deviation of 3. This can warrant the use of standard interpolation techniques without a great loss of variance. We use consumption Gini figures for this purpose, and construct our inequality series using 12 available observations. Ten observations for income inequality are also available (with a higher standard deviation of 4.2). However, we prefer consumption inequality series for reasons described in section 3.1. The inequality figures used in our study have been taken from the UNU-WIDER World Income Inequality Database (WIID, 2010). Low-quality non-representative inequality data (those ranked 4 in the WIID database) have been excluded. Care has been taken to only select the observations that appear coherent and reliable, and correspond to the changing economic realities.

Unlike inequality, poverty responds more readily to economic circumstances of the time and can thus fluctuate substantially. For instance, Pakistan's poverty headcount rate varied between 20 percent or less in late 1980s, according to some estimates, and over 35 percent in early 2000s. Besides, poverty figures for Pakistan are quite fickle. For instance, according to the World Bank World Development Indicators 2010, the poverty headcount ratio moves by an unbelievable 19% in a span of just two years, from 48.14% in 1996 to 29.05% in 1999. This fall follows a 16% drop in poverty in the previous six years (1990-1996), which is equally incredible, as this decade of low growth, fiscal deficits, large floods and crop failures probably accompanied a rise, and not fall, in poverty. For these reasons, it is unfeasible to construct an interpolated poverty time series and estimate the association of poverty with foreign remittances. A negative relationship between the two variables can nonetheless be seen in figure 6.

The remittances data are taken from the State Bank of Pakistan. Remittances are taken both as aggregate and with respect to their provenance, and are grouped with respect to three sending regions, namely North America, the Persian Gulf and Europe. These regions together form the destination of over 80 percent of the Pakistani migrants, and between 80 and 95 percent of the annual remittance receipts during the period examined. The three regional variables are constructed by adding their constituent countries in case of Gulf and North America, and the top three remitting countries in the case of Europe. The countries are: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (Persian Gulf), Canada and the United States of America (North America), and Germany, Norway and the United Kingdom (Europe).

The remaining variables come from the World Bank World Development Indicator database. The descriptive statistics of our dataset are given in table 8.

#### 4.1.2. Econometric specification

We employ the Instrumental Variable General Method of Moments (IV GMM) technique to estimate the impact of remittance flows on inequality. The use of lagged remittances as instrument in a 2-step GMM estimation takes care of the endogeneity problem to some extent (Aggarwal et al. 2006; Catrinescu et al. 2009). The instrument clears all validity tests. Our estimated model includes variables which are frequently shown in the theoretical and empirical literature to significantly interact with inequality. The baseline equation is a simplified specification adopted from Gupta et al. (2009) and can be written as:

$$INEQ_t = \alpha + \beta REM_t + \delta X_t + \varepsilon_t \quad (1)$$

where  $INEQ$  is a given year's Gini inequality measure,  $REM$  is remittances and  $X$  the vector of other variables included in the regressions.  $\varepsilon$  is the error term. We also estimated a dynamic version of the model. However, this model was dropped as the addition of lagged inequality variable caused problems of multicollinearity and excessively high  $R^2$  values. Below, we briefly describe the regressors in our model, and their *raison d'être*.

We alternately take primary and secondary enrolment rate as proxies for human capital in the country. These proxies has been suggested to be adequate measures of human capital given their strong correlation with inequality in the developing countries (Calderon and Serven 2004; Mughal and Diawara 2011). GDP growth rate is another important variable in the model, whose role in accentuating or attenuating economic disparities has been extensively debated in the economic literature, with some finding growth a cause of gradual fall in inequality, others a factor in the widening of inequities and still others finding it distribution neutral. For a survey of the literature on the growth inequality nexus, see for instance Barro (1999) and Ehrhart (2009)

We include trade openness as an indicator of the opening world economy. Literature has shown globalization to significantly affect economic disparities within and between countries (see for instance Fisher 2001; Milanovic, 2005; Goldberg and Pavcnik, 2007). Inflation, particularly food inflation, hurts urban population more than the rural population, so its impact on inequality may be beneficial in a country such as Pakistan, with large and mainly poor rural population. However, if the inflationary spell hurts the urban poor disproportionately, it may equally cause inequality to rise (Roine et al 2009).

Population growth is another factor significantly affecting inequality. Pakistan has entered the demographic dividend phase<sup>5</sup> after some decades of high population growth. High population growth among the poor may have raised the level of income disparity in the country. This increase could exasperate the already high dependency ratio, thus raising the financial burden on the less well-off households.

Just like the country's demography, Pakistan's economy has also greatly evolved in the last three decades. The share of agriculture has dropped from 30% to about 20%, while that of the industrial sector has moved up from 23 to 26%. As shown in the micro analysis in the previous section, poverty and inequality in Pakistan is strongly associated with the rural, predominantly agricultural areas. Change in sectoral distribution may therefore impact the country's inequality scenario as well. We include the ratio of agricultural to industrial value-added in the national output to count for this potential driver of inequality.

We also add in our model an indicator for natural catastrophes, given the significant ways in which they can alter the production levels of an economy, and consequently, the welfare of the population. Our disaster variable is a dummy variable which takes the value of one for a

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<sup>5</sup> Pakistan entered the demographic dividend phase around 1990 and will probably not come out of it till 2045 (Nayab, 2008).

loss of 1000 or more lives, loss of \$1 billion or 1 million casualties in any given year. In our studied period, six years (1992, 1996, 1998, 1999, 2005 and 2007) meet the above criteria, either due to severe flooding or the 7.6 magnitude earthquake in 2005.

#### **4.2. Foreign Remittances and Inequality**

The results given in Table 9 show that population growth rate is by far the strongest determinant of inequality in our model. Its sign is expectedly positive, indicating that demographic change has played a significant role in the evolution of inequality in Pakistan. Inflation is another factor strongly associated with inequality in Pakistan. It appears to hurt the poor disproportionately, acting as a regressive tax on them through higher relative prices of edibles in the face of decreasing purchasing power.

Table 9 Here

Foreign remittances, however, do not have a significant association with inequality. Similar non-significant association is seen for the remittances from Pakistan's principal remittance-sending region: the Persian Gulf. Pakistani migrant community in the Gulf Cooperation Council (GCC) states is a heterogeneous group, composed of highly qualified professionals as well as semi and unskilled labour. The weight of semi and unskilled low-wage labour has, however, been dominant over the years. This to certain extent reflects Pakistan's own labour market, where university-educated labour is only a small part of the total work force. A statistically non-significant result may in this case not be a surprise.

In contrast, the impact of North American remittances is negative and significant, an unexpected finding given the long-distance, usually permanent and brain-drain nature of these remittances. This may point to the fact that remittances from this community are not limited to its relatively well-to-do kith and kin back home, and part of the remittances are spent on truly altruistic motives. The fact that these remittances often finance community initiatives and non-governmental organizations involved in social and economic development activities can be cited in the defense of this explanation. Several charity organizations are set up and sustained by the North American Pakistani Diaspora<sup>6</sup>. Similarly, anecdotal evidence suggests that Pakistani households based in the US and Canada often prefer spending their Zakat on the poor back home<sup>7</sup>. This finding is also in line with the postulate of Koechlin and Leon (2006) that with the gradual settling down of a migrant community in the host country, the cost of migration falls and remittances no longer add substantially to disparities in the home country.

Remittance flows from Europe appear to be associated with higher consumption inequality at home. Though transfers from the United Kingdom and other continental European countries make up only a tenth of Pakistan's total remittance receipts, they are confined in scope. A handful of departments in the upper part of Pakistan receive the bulk of remittances from this region.

Another interesting finding is that globalization has a marginal and mixed impact on the evolution of inequality in Pakistan. Trade openness has a weak association with inequality. The share of the country's foreign trade (as percentage of GDP) has varied little in the three decades studied, the share in the first and the last year of the period being 35percent.

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<sup>6</sup> According to Najam (2006), about 40% of the monetary and in-kind giving by the Pakistani American diaspora is directed towards various causes in Pakistan.

<sup>7</sup> About half of monetary and in-kind giving by the Pakistani community in the US, estimated to be relatively more generous compared to other communities in the US, is motivated by faith-based obligations to be charitable (Najam, 2006).

Natural catastrophes apparently have a negligible and statistically insignificant impact on inequality over the studied time period. This is a welcome finding, knowing that Pakistan has suffered several disasters in the last two decades that have cost loss of precious lives and property.

Use of other potential drivers and measures of inequality does not change our results (regressions not shown).

## **5. Concluding Remarks**

In this paper, we have attempted to study the relationship of remittance inflows with inequality and poverty in Pakistan. We find support for two out of four hypotheses. Remittances to Pakistan do appear to lower poverty substantially (H1). Not only has the probability of being poor decreases, but the depth and severity of poverty also go down. Receiving foreign remittances reduces the marginal likelihood of the household being below the official poverty line substantially by 12 to 32 percent, depending on the year and the models used. As hypothesized, we found mixed results for Gulf and European remittances (H3). Transfers from the GCC states show a negative (though statistically insignificant) impact on inequality, while those from Europe show a positive one.

Remittances coming from North America, contrary to our expectations, are strongly and negatively associated with consumption inequality in Pakistan.

Our fourth hypothesis, the one pertaining to overall inequality, is partly validated. We do not find a clear-cut and significant impact of foreign remittances on inequality during the last three decades (macro analysis). This may owe, in part, to the difference in signs, magnitudes and significance of the corresponding impacts of remittances coming from the three major remitting regions. Nevertheless, the impact on inequality, as found in the microeconomic analysis using the 2005-06 and 2007-08 household survey data, is substantial and beneficial. Receipt of remittances is associated with lower consumption inequality.

We find a much weaker reduction of inequality and poverty associated with internal remittances. Both of these impacts (those on poverty and inequality) can be explained by observing their distributional effects. Foreign remittance receiving households are more likely to move into the upper consumption quintiles, whereas internal remittance recipients do not. This owes to the high differential between local wages and those in remittance-sending regions.

These analyses suggest that the potential of remittances, particularly foreign remittances, for poverty eradication and inequality reduction should therefore not be neglected. As Clemens (2010) put it:

“No known schooling intervention, road project, anti-sweatshop campaign, microcredit program, investment facility, export promotion agency, or any other in situ development program can surely and immediately raise the earning power of a large group of very poor people to anywhere near this degree.”

How can then Pakistan maximize the benefits of remittance inflows? First, by giving importance to its human capital development: as developed countries are increasingly pursuing skill-selective immigration policies, and doors to semi or unskilled migration are more or less closed. Second, by improving the access and quality of banking services available to remittance receiving households for savings to be efficiently channeled towards more productive investments. Third, domestic remittances also seem to be effective towards reducing poverty, and steps leading to higher geographical mobility may thus broaden the way to upward income mobility of the poor.

International remittances to Pakistan have so far gone to a small number of districts. Their level of development and urbanization may influence the way remittances affect poverty and inequality. Hence, a study by district is needed to discern the situation on the local level.

To sum up, we state that remittances have, in the past, helped reduce poverty in Pakistan, and make the country more egalitarian. However, some caution is in order: over-reliance on remittances may induce dependency mindset in the population, which may preclude growth through productive investments. High flows of remittances may also exacerbate the macroeconomic problems by worsening the Dutch Disease, from which the economy is already suffering (Mughal and Makhlouf, 2011).

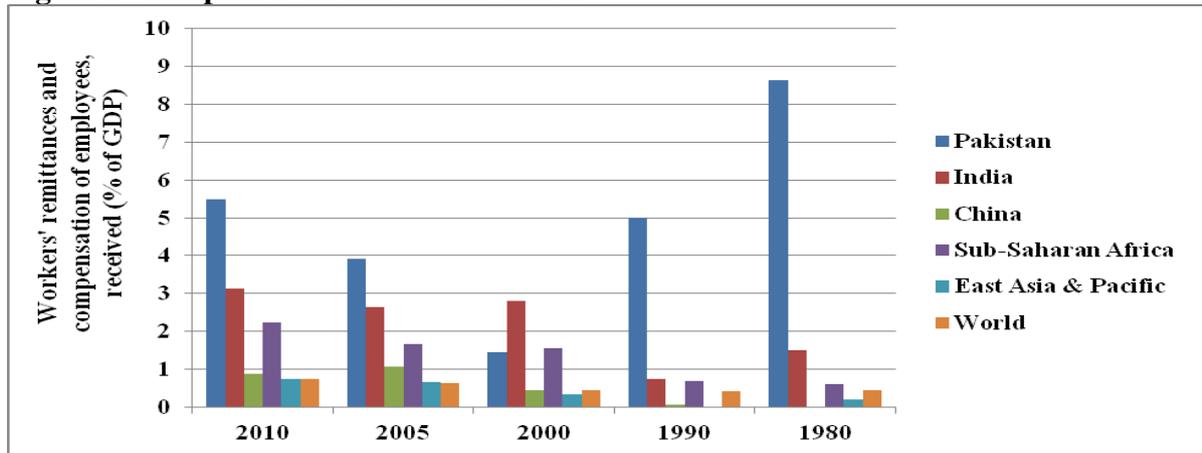
Using remittances as a permanent source of poverty alleviation is a strategy fraught with risks as the levers of such development are bound to be away from the country, in the hands of foreign governments that - during economic downturns - often find themselves facing popular public pressure to protect local jobs at the cost of foreign labour. For improving the plight of the poor, none can beat a thoughtfully planned, well-executed, far-reaching home-grown development program.

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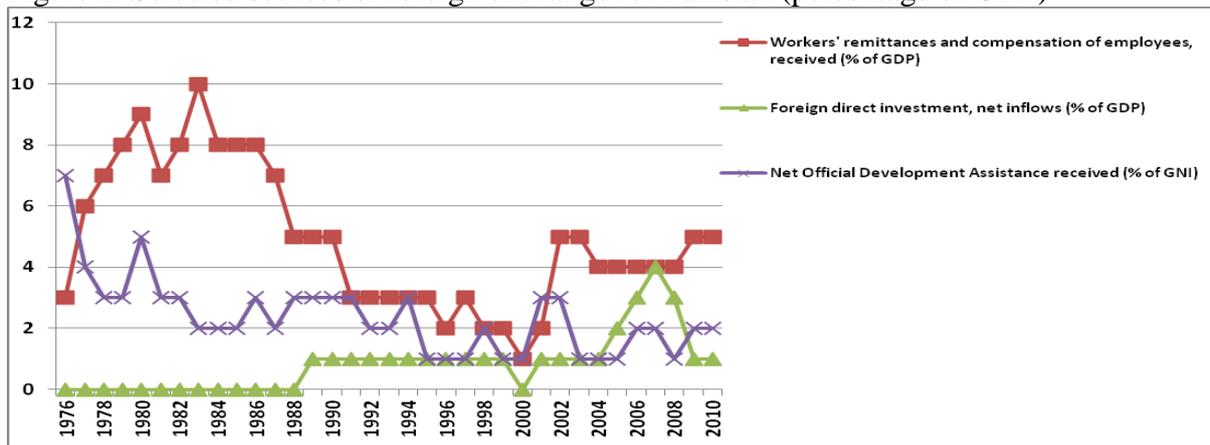
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**Figure 1. Comparative remittances trends**



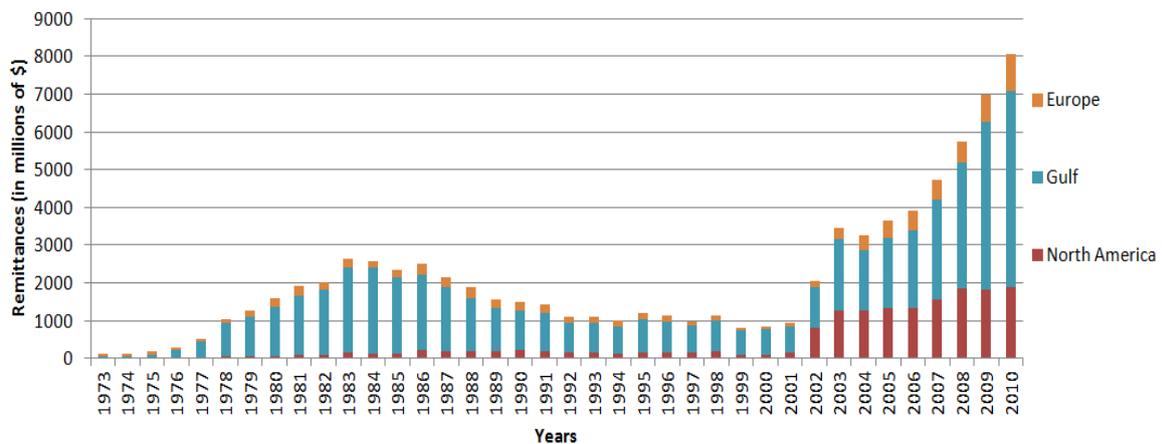
Source: World Bank (2010)

**Figure 2. Selected sources of foreign exchange for Pakistan (percentage of GDP)**



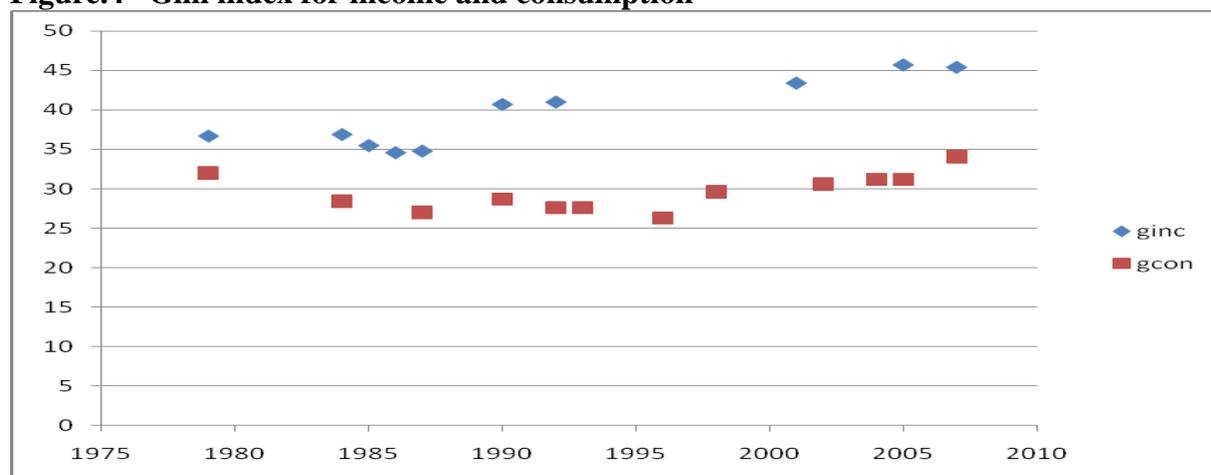
Source: World Bank (2010)

**Figure 3. Remittances to Pakistan (cash flow)**



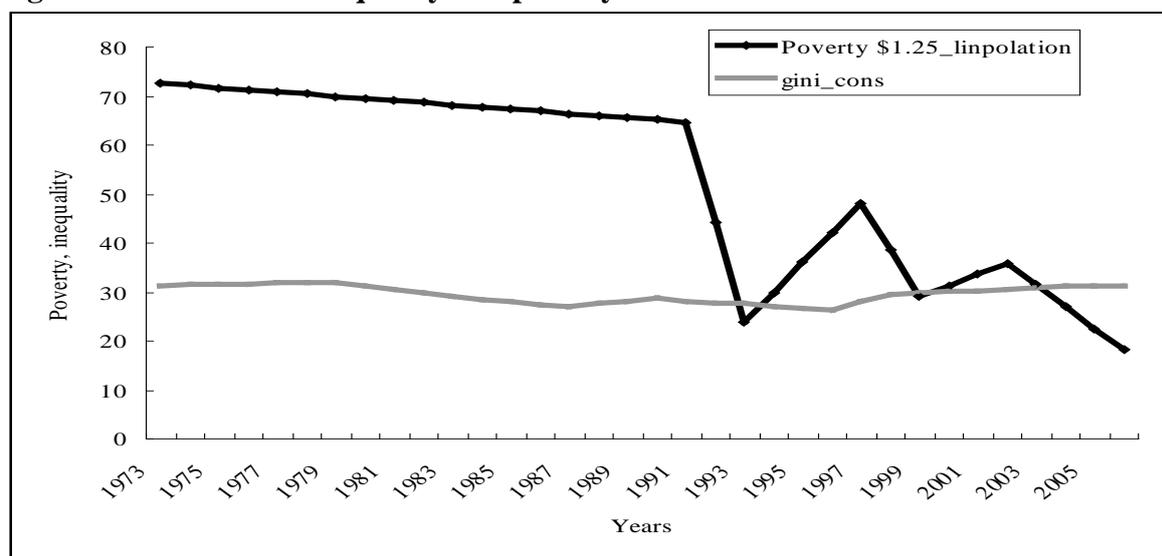
Source: State Bank of Pakistan

**Figure.4 Gini index for income and consumption**



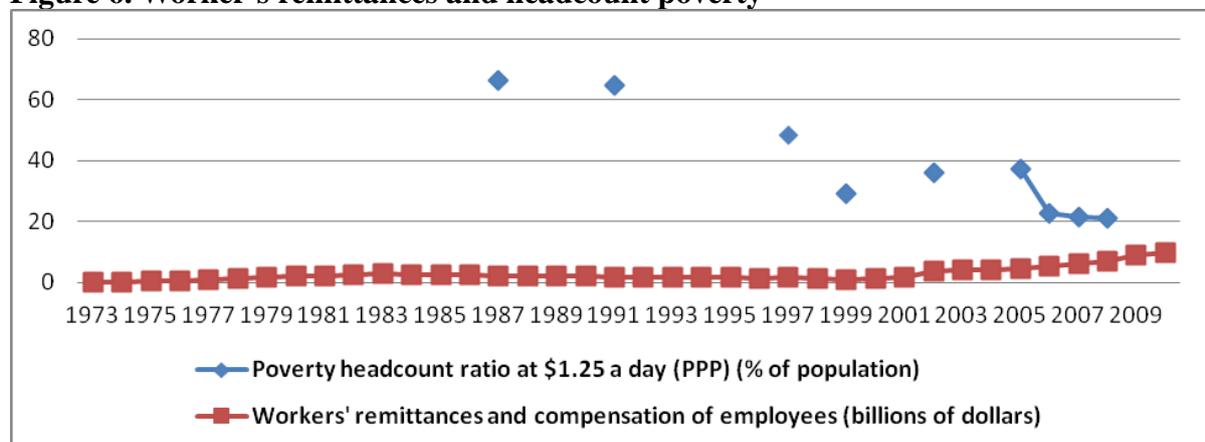
Source: UNU-WIDER World Income Inequality Database, May 2008

**Figure 5. Evolution of inequality and poverty trends**



Source: Deininger and Squire (1996) and World Bank (2010)

**Figure 6. Worker's remittances and headcount poverty**



Source: World Bank (2010)

**Table 1. Remittance receipt and household poverty and inequality – some stylized facts**

	2005-06		2007-08	
	foreign remittances		foreign remittances	
	0	1	0	1
<b>P0 - Avg.</b>	0.3723	0.3008	0.2239	0.0855
<b>P1 - Avg.</b>	0.1067	0.0843	0.0536	0.0227
<b>P2 - Avg.</b>	0.0429	0.0340	0.0195	0.0076

**Table 2. Foreign Remittances and Poverty – baseline model**

VARIABLES	2005			2007		
	p0_e14	p1_expadeq14	p2_expadeq14	p0_e14	p1_expadeq14	p2_expadeq14
<b>forrem</b>	-0.943*** (0.0990)	-0.0790*** (0.00717)	-0.0370*** (0.00370)	-0.582*** (0.180)	-0.0382*** (0.00971)	-0.0155*** (0.00405)
<b>hhsiz</b>	0.209*** (0.00919)	0.0206*** (0.000750)	0.00924*** (0.000419)	0.239*** (0.0138)	0.0132*** (0.000975)	0.00444*** (0.000441)
<b>femalehead</b>	-0.738*** (0.173)	-0.0554*** (0.0166)	-0.0184* (0.0103)	-0.782 (0.492)	-0.0524*** (0.0174)	-0.0227*** (0.00679)
<b>nworker18</b>	-0.133*** (0.0119)	-0.0151*** (0.00123)	-0.00658*** (0.000730)	-0.135*** (0.0218)	-0.00728*** (0.00158)	-0.00156** (0.000768)
<b>age</b>	-0.00424*** (0.00139)	0.000113 (0.000136)	0.000137* (7.34e-05)	-0.00424** (0.00208)	-0.000233 (0.000165)	-5.75e-05 (8.17e-05)
<b>married</b>	0.148*** (0.0507)	0.00470 (0.00476)	0.000362 (0.00251)	0.103 (0.0702)	0.00373 (0.00521)	-0.000325 (0.00255)
<b>enrollmentstatus</b>	-0.592*** (0.0340)	-0.0677*** (0.00376)	-0.0298*** (0.00201)	-0.517*** (0.0646)	-0.0373*** (0.00528)	-0.0139*** (0.00251)
<b>lninc</b>	-0.190*** (0.0188)	-0.0199*** (0.00181)	-0.0101*** (0.00109)	-0.109*** (0.0193)	-0.00631*** (0.00114)	-0.00296*** (0.000509)
<b>lnsaving</b>	-0.302*** (0.0156)	-0.0228*** (0.00139)	-0.00957*** (0.000769)	-0.493*** (0.0289)	-0.0265*** (0.00191)	-0.0102*** (0.000957)
<b>region</b>	-0.783*** (0.0333)	-0.0807*** (0.00318)	-0.0343*** (0.00162)	-0.916*** (0.0659)	-0.0597*** (0.00428)	-0.0234*** (0.00188)
<b>province</b>	0.0343** (0.0136)	-0.00140 (0.00146)	-0.00230*** (0.000816)	-0.0712*** (0.0270)	-0.00372 (0.00233)	-0.000919 (0.00117)
<b>Constant</b>	4.444*** (0.233)	0.550*** (0.0216)	0.246*** (0.0133)	5.235*** (0.366)	0.412*** (0.0261)	0.160*** (0.0128)
<b>Observations</b>	8,902	8,902	8,902	2,844	2,844	2,844
<b>R-squared</b>		<b>0.346</b>	<b>0.259</b>		<b>0.274</b>	<b>0.188</b>

Robust standard errors in parentheses

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

Table 3. Foreign Remittances and Poverty – alternative model

VARIABLES	2005			2007		
	p0_e14	p1_expadeq14	p2_expadeq14	p0_e14	p1_expadeq14	p2_expadeq14
<b>forrem</b>	-1.291*** (0.0995)	-0.120*** (0.00784)	-0.0582*** (0.00439)	-2.219** (1.035)	-0.115** (0.0460)	-0.0572** (0.0265)
<b>hhsiz</b>	0.211*** (0.00838)	0.0245*** (0.000787)	0.0113*** (0.000460)	0.234*** (0.0426)	0.0168*** (0.00334)	0.00693*** (0.00190)
<b>femalehead</b>	-0.628*** (0.149)	-0.0683*** (0.0170)	-0.0244** (0.0117)		-0.130*** (0.0337)	-0.0634*** (0.0216)
<b>nworker18</b>	-0.162*** (0.0109)	-0.0200*** (0.00127)	-0.00852*** (0.000836)	-0.174*** (0.0593)	-0.0120*** (0.00457)	-0.00413 (0.00275)
<b>age</b>	-0.00452*** (0.00123)	-0.000121 (0.000138)	2.92e-05 (8.19e-05)	-0.00196 (0.00481)	-8.62e-05 (0.000336)	4.51e-07 (0.000155)
<b>married</b>	0.138*** (0.0472)	0.0122** (0.00500)	0.00583** (0.00296)	0.136 (0.166)	-0.00961 (0.0123)	-0.00690 (0.00676)
<b>enrollmentstatus</b>	-0.609*** (0.0300)	-0.0763*** (0.00361)	-0.0351*** (0.00205)	-0.783*** (0.155)	-0.0468*** (0.0120)	-0.0157*** (0.00599)
<b>lninc</b>	-0.224*** (0.0188)	-0.0290*** (0.00197)	-0.0164*** (0.00138)	-0.170*** (0.0589)	-0.0161*** (0.00621)	-0.00951** (0.00437)
<b>Agri_land</b>	-0.472*** (0.0475)	-0.0493*** (0.00523)	-0.0230*** (0.00305)	-0.590** (0.269)	-0.0361** (0.0164)	-0.0193** (0.00773)
<b>region</b>	-0.796*** (0.0297)	-0.0985*** (0.00333)	-0.0445*** (0.00183)	-0.854*** (0.158)	-0.0626*** (0.0106)	-0.0255*** (0.00500)
<b>province</b>	0.0157 (0.0134)	-0.00297* (0.00155)	-0.00286*** (0.000889)	-0.0526 (0.0665)	-0.00608 (0.00547)	-0.00276 (0.00293)
<b>Constant</b>	2.229*** (0.208)	0.453*** (0.0216)	0.230*** (0.0145)	1.165* (0.679)	0.269*** (0.0743)	0.138*** (0.0520)
<b>Observations</b>	10,545	10,545	10,545	516	523	523
<b>R-squared</b>		<b>0.335</b>	<b>0.258</b>		<b>0.265</b>	<b>0.204</b>

Robust standard errors in parentheses

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

Table 4. Internal Remittances and Poverty

VARIABLES	Baseline model			Alternative model		
	p0_e14	p1_expadeq14	p2_expadeq14	p0_e14	p1_expadeq14	p2_expadeq14
<b>intrem</b>	-0.672*** (0.153)	-0.0280*** (0.00786)	-0.0125*** (0.00315)	-0.0632 (0.251)	-0.0110 (0.0189)	-0.0102 (0.00968)
<b>hhsiz</b>	0.171*** (0.0145)	0.0104*** (0.000999)	0.00335*** (0.000424)	0.209*** (0.0367)	0.0155*** (0.00321)	0.00611*** (0.00181)
<b>femalehead</b>	-0.800** (0.352)	-0.0589*** (0.0136)	-0.0262*** (0.00563)	-1.629*** (0.611)	-0.116*** (0.0406)	-0.0568** (0.0225)
<b>nworker18</b>	-0.105*** (0.0203)	-0.00553*** (0.00151)	-0.000803 (0.000730)	-0.169*** (0.0554)	-0.0119*** (0.00452)	-0.00379 (0.00263)
<b>age</b>	-0.00435** (0.00192)	-0.000328** (0.000156)	-0.000110 (7.66e-05)	-0.00472 (0.00438)	-0.000381 (0.000330)	-0.000143 (0.000165)
<b>married</b>	0.111* (0.0653)	0.00579 (0.00494)	0.00102 (0.00239)	0.189 (0.154)	-0.00397 (0.0117)	-0.00380 (0.00627)
<b>enrollmentstatus</b>	-0.493*** (0.0601)	-0.0389*** (0.00502)	-0.0145*** (0.00235)	-0.734*** (0.140)	-0.0471*** (0.0114)	-0.0164*** (0.00572)
<b>lninc</b>	-0.0522*** (0.0145)	-0.00472*** (0.00108)	-0.00260*** (0.000541)	-0.0859*** (0.0327)	-0.0117*** (0.00414)	-0.00692*** (0.00265)
<b>lnsaving</b>	-0.430*** (0.0269)	-0.0261*** (0.00185)	-0.0102*** (0.000928)			
<b>agrilandownership</b>				-0.614** (0.240)	-0.0379*** (0.0144)	-0.0192*** (0.00645)

<b>region</b>	-0.896***	-0.0586***	-0.0224***	-0.861***	-0.0592***	-0.0241***
	(0.0586)	(0.00404)	(0.00176)	(0.140)	(0.0102)	(0.00474)
<b>province</b>	-0.0551**	-0.00471**	-0.00165	-0.0399	-0.00470	-0.00199
	(0.0250)	(0.00223)	(0.00111)	(0.0626)	(0.00515)	(0.00269)
<b>Constant</b>	4.333***	0.408***	0.164***	0.353	0.226***	0.112***
	(0.317)	(0.0257)	(0.0131)	(0.455)	(0.0548)	(0.0348)
<b>Observations</b>	3,179	3,179	3,179	598	598	598
<b>R-squared</b>		0.252	0.176		0.239	0.184

**Robust standard errors in parentheses**  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5. Foreign Remittances and Inequality

VARIABLES	2005-06									2007-
	Bottom quintile	q_e2	q_e3	q_e4	Top quintile	mld	Bottom quintile	q_e2	q_e3	
<b>forrem</b>	-0.836***	-0.436***	-0.201***	0.155**	0.796***	-0.304***	-1.148***	-0.323*	-0.317**	
	(0.147)	(0.0875)	(0.0733)	(0.0673)	(0.0883)	(0.0244)	(0.442)	(0.181)	(0.156)	
<b>hhsz</b>	-0.234***	-0.0161**	0.0202***	0.0480***	0.0724***	-0.0417***	-0.186***	0.00961	0.0179	
	(0.0107)	(0.00647)	(0.00577)	(0.00620)	(0.00789)	(0.00188)	(0.0222)	(0.0128)	(0.0110)	
<b>femalehead</b>	-0.762***	-0.168	0.128	-0.0443	0.621***	-0.254***	-0.294	-0.167	-0.754*	
	(0.168)	(0.138)	(0.133)	(0.146)	(0.238)	(0.0569)	(0.434)	(0.356)	(0.397)	
<b>nworker18</b>	-0.0583***	-0.0894***	-0.0532***	-0.00428	0.0976***	-0.0246***	-0.0173	-0.153***	-0.0375*	
	(0.0166)	(0.0120)	(0.0113)	(0.0112)	(0.0135)	(0.00325)	(0.0308)	(0.0228)	(0.0201)	
<b>age</b>	-0.00391**	-0.00296**	0.00186	0.00569***	0.00685***	-0.00315***	-0.00605**	-0.00210	0.00191	
	(0.00165)	(0.00140)	(0.00128)	(0.00129)	(0.00166)	(0.000394)	(0.00267)	(0.00222)	(0.00189)	
<b>married</b>	0.0436	0.0438	-0.0497	-0.119**	-0.190***	0.0586***	0.101	0.139*	-0.0651	
	(0.0593)	(0.0521)	(0.0491)	(0.0492)	(0.0610)	(0.0157)	(0.0919)	(0.0768)	(0.0628)	
<b>enrollmentstatus</b>	-0.521***	-0.277***	0.0129	0.335***	0.657***	-0.241***	-0.689***	-0.233***	-0.0618	
	(0.0418)	(0.0359)	(0.0352)	(0.0361)	(0.0473)	(0.00946)	(0.0863)	(0.0691)	(0.0629)	
<b>lninc</b>	-0.182***	-0.0734***	-0.00671	0.00125	0.251***	-0.0938***	-0.120***	-0.0407***	-0.0601***	
	(0.0164)	(0.0106)	(0.0109)	(0.0119)	(0.0395)	(0.00747)	(0.0273)	(0.0158)	(0.0165)	
<b>lnsaving</b>	-0.270***	-0.111***	-0.0490***	0.0191	0.381***	-0.146***	-0.376***	-0.158***	-0.100***	
	(0.0180)	(0.0134)	(0.0120)	(0.0125)	(0.0206)	(0.00463)	(0.0343)	(0.0259)	(0.0218)	
<b>region</b>	-1.017***	-0.295***	0.0279	0.277***	0.747***	-0.338***	-0.962***	-0.277***	-0.154***	
	(0.0473)	(0.0349)	(0.0332)	(0.0331)	(0.0412)	(0.00981)	(0.0876)	(0.0676)	(0.0582)	
<b>province</b>	-0.0187	-0.00564	0.0188	0.0253*	-0.0517***	0.00727*	-0.142***	0.0366	-0.0187	
	(0.0172)	(0.0141)	(0.0136)	(0.0137)	(0.0169)	(0.00372)	(0.0394)	(0.0295)	(0.0248)	
<b>Constant</b>	6.145***	1.805***	-0.255	-1.814***	-9.350***	3.420***	6.590***	1.800***	1.073***	
	(0.271)	(0.178)	(0.166)	(0.169)	(0.421)	(0.0776)	(0.503)	(0.331)	(0.279)	
<b>Observations</b>	8,902	8,902	8,902	8,902	8,902	8,902	2,844	2,844	2,844	
<b>R-squared</b>						<b>0.570</b>				

**Robust standard errors in parentheses**  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6. Internal Remittances and Inequality (2007-08)

VARIABLES	Bottom quintile	q_e2	q_e3	q_e4	Top quintile	mld
<b>intrem</b>	-0.583*** (0.148)	0.246** (0.101)	-0.157 (0.105)	0.0519 (0.0919)	0.138 (0.111)	-0.0706** (0.0290)
<b>hhsiz</b>	-0.197*** (0.0220)	0.00573 (0.0119)	0.0107 (0.0102)	-0.0122 (0.00974)	0.0697*** (0.0107)	-0.0293*** (0.00271)
<b>femalehead</b>	-0.416 (0.290)	-0.299 (0.224)	-0.381 (0.240)	0.0468 (0.201)	0.454* (0.267)	-0.225*** (0.0692)
<b>nworker18</b>	-0.0163 (0.0305)	-0.153*** (0.0220)	-0.0395** (0.0193)	0.0438** (0.0184)	0.0821*** (0.0204)	-0.0300*** (0.00515)
<b>age</b>	-0.00588** (0.00253)	-0.00188 (0.00204)	0.000931 (0.00178)	-0.000924 (0.00166)	0.00648*** (0.00198)	-0.00269*** (0.000521)
<b>married</b>	0.111 (0.0880)	0.0966 (0.0705)	-0.0653 (0.0593)	-0.0756 (0.0556)	-0.0478 (0.0642)	0.0278 (0.0171)
<b>enrollmentstatus</b>	-0.671*** (0.0836)	-0.260*** (0.0652)	-0.0447 (0.0598)	0.136** (0.0556)	0.585*** (0.0652)	-0.228*** (0.0159)
<b>lninc</b>	-0.0597*** (0.0147)	-0.0197* (0.0118)	-0.0146 (0.0130)	0.00858 (0.0134)	0.0461** (0.0182)	-0.0348*** (0.00541)
<b>lnsaving</b>	-0.411*** (0.0332)	-0.172*** (0.0243)	-0.0957*** (0.0204)	0.0375* (0.0207)	0.475*** (0.0282)	-0.175*** (0.00666)
<b>region</b>	-1.018*** (0.0867)	-0.318*** (0.0635)	-0.188*** (0.0558)	0.179*** (0.0518)	0.782*** (0.0583)	-0.348*** (0.0146)
<b>province</b>	-0.139*** (0.0386)	0.0334 (0.0283)	-0.0128 (0.0238)	0.0295 (0.0226)	0.0348 (0.0251)	-0.00821 (0.00654)
<b>Constant</b>	6.274*** (0.416)	1.782*** (0.298)	0.574** (0.249)	-1.440*** (0.252)	-8.379*** (0.395)	3.086*** (0.0881)
<b>Observations</b>	3,179	3,179	3,179	3,179	3,179	3,179
<b>R-squared</b>						<b>0.513</b>

Robust standard errors in parentheses

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

Table 7. Remittances and Inequality – Kernel Propensity Score Matching estimation

	Foreign Remittances							
	2005				2007			
	Treated	Controls	Difference	S.E.	Treated	Controls	Difference	S.E.
Forrem (q_e1)	0.05	0.14	-0.09	0.01	0.05	0.09	-0.04	0.01
Forrem (q_e2)	0.09	0.17	-0.08	0.01	0.09	0.12	-0.03	0.01
Forrem (q_e3)	0.16	0.18	-0.02	0.02	0.12	0.28	-0.16	0.02
Forrem (q_e4)	0.28	0.21	0.08	0.02	0.33	0.24	0.09	0.02
Forrem (q_e5)	0.42	0.30	0.12	0.02	0.41	0.26	0.14	0.02

Internal Remittances			
2007			
	Treated	Controls	Difference
intrem (q_e1)	0.09	0.12	-0.03
intrem (q_e2)	0.22	0.16	0.06
intrem (q_e3)	0.16	0.20	-0.04
intrem (q_e4)	0.26	0.24	0.02
intrem (q_e5)	0.27	0.28	-0.01

Table 8. Summary statistics – macroeconomic model

VARIABLES	Description	N	mean
Inequality (original series)		12	29.5

Inequality (interpolated)		29	29.3
Gdp_growth__annual__	in % form	29	5.28
merchandise_trade____of_gdp_	in % form	29	31.0
n2	official development assistance in millions of dollars	29	1,16
f2	FDI in millions of dollars	29	737.
population_growth__annual__	in % form	29	2.53
Prim2	Primary enrollment (original series)	24	60.6
Sec2	Secondary enrollment (original series)	21	21.3
Secondary enrollment (interpolated)		28	22.3
Primary enrollment (interpolated)		29	61.9
r2	remittances in millions of dollars	29	2,30
Remittances from Gulf		29	1,35
Remittances from Europe		29	228.
Remittances from North America		29	370.
CPI	consumer price index, taken from the World Bank World Development Indicators	29	67.0

Table 9. Foreign remittances and Inequality – Macroeconomic Analysis

VARIABLES	(1) gcon2	(2) gcon2
lgulf		-1.739 (2.013)
lnorth_america		-3.058*** (0.764)
leurope		8.148*** (2.995)
population_growth__annual__	7.693* (4.072)	10.66*** (4.008)
prim2	-0.111*** (0.0426)	-0.0558 (0.0568)
gdp_growth__annual__	0.125 (0.176)	-0.186 (0.193)
cpi	0.111*** (0.0147)	0.148*** (0.0233)
merchandise_trade____of_gdp_	0.224* (0.118)	-0.0959 (0.190)
structural_change	2.275 (2.823)	2.407 (4.010)
disaster	-0.116 (0.855)	0.0553 (0.658)
lrem	1.030 (0.682)	
Constant	-22.69 (19.55)	-63.57** (29.21)
Observations	28	28
R-squared	0.791	0.784

Robust standard errors in parentheses

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

## Appendix

Table A1 - Summary Statistics

VARIABLES	2005					2007					Description
	N	mean	sd	min	max	N	mean	sd	min	max	
age	112,995	23.20	18.96	0	99	107,832	23.55	18.84	0	99	age in completed years
sex	112,995	0.499	0.500	0	1	107,832	0.504	0.500	0	1	sex of person
married	112,995	1.432	0.586	1	5	107,832	0.361	0.480	0	1	marital status of person
femalehead	134,819	0.0105	0.102	0	1	124,835	0.0119	0.109	0	1	Is the head of the household
hhsz	134,819	8.590	4.654	1	55	124,835	8.236	4.091	1	37	Household size
nworker18	79,650	4.454	2.449	0	22	73,247	4.382	2.270	0	16	number of adult workers in household
enrollmentstatus	100,872	0.545	0.498	0	1	97,117	0.567	0.495	0	1	did the person ever attend school
region	112,995	0.392	0.488	0	1	108,469	0.391	0.488	0	1	Region of residence
province	112,995	2.112	1.085	1	4	108,469	2.126	1.105	1	4	Province of residence
forrem	15,442	0.0571	0.232	0	1	8,136	0.0431	0.203	0	1	Did the person receive remittances
intrem						9,118	0.0838	0.277	0	1	Did the person receive remittances from abroad
inc	131,143	115,915	151,586	0	4.500e+06	124,830	142,101	223,774	1	1.022e+07	total income x 1000
exp	134,768	109,712	98,988	0	2.522e+06	124,830	132,429	112,489	1,700	2.644e+06	total expenditures x 1000
savings	87,461	46,212	178,366	10	2.000e+07	93,287	85,070	478,911	0	3.000e+07	Total Value of Savings
agri_land	100,252	0.128	0.334	0	1	15,511	0.0896	0.286	0	1	Did any of the household members own agricultural land
expadeq14	134,768	18,516	18,594	0	630,596	124,830	22,983	21,424	340	678,343	adult equivalent per head of household
p0_e14	134,819	0.372	0.483	0	1	124,835	0.216	0.411	0	1	poverty headcount based on 2005 PPP adjusted consumption
p1_expadeq14	134,819	0.107	0.178	0	1	124,835	0.0505	0.123	0	0.970	poverty gap based on underequivalized consumption
p2_expadeq14	134,819	0.0429	0.0949	0	1	124,835	0.0178	0.0585	0	0.941	squared poverty gap based on underequivalized consumption
mld	134,762	0.230	0.647	-3.135	7.553	124,830	0.202	0.609	-	4.355	mean log deviation of expenditure

2.994