Impact of Remittances on Household Welfare in Pakistan

By

Mehtab Habib

Department of Economics
Pakistan Institute of Development Economics
Islamabad, Pakistan
2015

Impact of Remittances on Household Welfare in Pakistan

By

Mehtab Habib
05/M.Phil.-Eco/PIDE/2011

Supervisor
Dr. Shujaat Farooq
Assistant Professor
Pakistan Institute of Development Economics

The dissertation is submitted to Pakistan Institute of Development Economics Islamabad in partial fulfillment of the requirement for the award of the degree of Masters of Philosophy in Economics

DEDICATION

This work is dedicated

To

My Mother

&

My father Syed Habib Shah

All I have and will accomplish is only possible due to their love and sacrifices.

DECLARATION

I, Mehtab Habib, hereby declare that the work contained in this thesis is my own and that other scholars' works referred to here have been duly acknowledged. I also declare that this thesis is original and has not been submitted elsewhere for a degree.

_____

Mehtab Habib

ACKNOWLEDGEMENT

First of all I am grateful to Almighty Allah the most compassionate and the most gracious who gave me strength to accomplish this task successfully. I am extremely grateful to my parents for raising me with the love for knowledge, creativity and ambition, for instilling the qualities of humility and hard work in me, and for their sacrifices and hard work in order to provide me with the best of everything. Their dreams and aspirations to see me as a successful individual have served as the main motivation behind all my quests to achieve excellence in academics and at work.

I wish to express my sincere gratitude to my supervisor, Dr. Shujaat Farooq for sharing his knowledge, innovative ideas and passion for this piece of work. His doors has always been open for guidance and discussion, and he has been more than generous with his time – including vacation hours spent in his home. He taught me much of what I know about my topic and his encouragement and enthusiasm has been unwavering and has taught me to believe in myself as researcher. It is hard to imagine a better supervisor and I am forever grateful to him for his support and friendship. I have been very fortunate to work with and learn from him, and I will always remain indebted to him for all his efforts in facilitating the completion of this dissertation.

I also acknowledge the true friendship and best companionship of my friends Hassan Shah, Hassan Shahzad, Mohsin Kyani, Hamid Haroon, Nabeel Haq, Malik Sheryar, Muhammad Jawad, who add beautiful memories to my life.

A penultimate acknowledgement goes to my family members without whom the achievements in my life would be meaningless. Finally I would like to pay my regards to Pakistan Institute of Development Economics for giving me this opportunity to learn and excel.

Mehtab Habib

Table of Contents

List of Tables

List of Figures

Abstract

In the current debate on the different perspectives of remittances, the most investigated relationship is the impact that the receipt of remittances can craft on the welfare and development of the migrant sending economies. Though, most of the earlier studies concluded that remittances have a positive impact on poverty reduction and also contribute to the household welfare in societies from where the migrants originate. The problem with most of these studies and especially with the studies conducted in Pakistan is the selection biasedness, in a way that these studies did not consider the observable characteristics of the households that are included in their analysis.

The objective of this study is to deal with selection biasedness issue by using propensity score matching while also estimate the impact of remittances on some indicators of household welfare like poverty, current school enrollment of children, type of institution selected, prenatal care of the reproductive married women, her immunization and place of child delivery.

HIES 2010-11 data is used to evaluate the impact of remittances on some selected indicators of household welfare, for the school going age children 5-14 years and married women of 15-49 years. To tackle the issue of selection biasedness the methodology of propensity score matching is used in this study. It is assured by PSM that the observed characteristics are identical for both of the comparison and the treatment groups.

This study concluded that the receipt of remittances has a poverty reducing impact for the receiving households. While for the child schooling it is suggested that among the remittance receiving households the current school enrollment has appositive relationship with remittances, as far as the type of institution in which the child is admitted is concerned it is advocated that among the remittance receiving households the parents prefer to admit their children in the private schools in search of the better quality education. For the impact on the health status of the reproductive married women, this study tells that if these women belong to the remittances receptor household than there are more chances for receiving the prenatal care and immunization as the household budget constraint is eased by the remittance receipt and for place of child delivery variable it is depicted by this study that the reproductive married women prefer hospital instead of home for child delivery as these households have more resources to pay for the expenditures.

CHAPTER 1

INTRODUCTION

1.1 Introduction and Background

It is the nature of people that they respond to incentives and hence to earn better economic opportunities and benefits for the family and for themselves when they migrate from one place to another. Not only the impact of remittances is multidimensional but in terms of duration their impact can be seen in both short and long term. Increase in consumption, reduction in poverty and inequality is generally associated with the short term effect, while the long term effect is more suitably fitted to the socio-economic development including the positive returns to education and improvement in health standards and other facilities including the durable assets as well (Vidal, 1998).

There are some facets of remittances, like the ones introduced by Levitt, (1998) as "social transfers", which may include the flow of issues such as ideas, behaviors, identities and social capital, from host countries community to the migrant or transfers recipient society. When the migrant sending families receive the visits from the migrant workers or communicate with them through letters, emails, and phone calls. The migrants do not absorb all the new aspects of life of the host countries haphazardly rather a kind of a screening process is involved. While ignoring some unfavorable aspects according to the earlier community culture, some new ideas and origins are taken and adopted. Both of the constructive and destructive aspects are associated with social remittances. Although a constructive social reform is not guaranteed by the aspects that are absorbed by the migrants. Nevertheless, a positive contribution to overall social development is made by some forms of remittances and the exchange of health, educational and social practices and the transfer of new business skills. A question for the motivation is still open that whether this increase in this revenue transfer source has an impact on the decisions of the accumulation of human capital, education and health care (Mara et al., 2012).

Currently the most important source of external financing is remittances and in the recent years remittances to developing countries are increasingly at a relatively fast pace. In addition, a countercyclical behavior is shown by remittances and also appears to be more stable as compared to the other types of external contributions.

Table 1: Remit Impulse and Use

Impulse	Consumption	Investment
• Partaking risk	• Purchasing the essential needs like education, health, food and a precautionary saving.	• Investment in household technologies and other liquid assets like agricultural machinery and livestock.
• Altruism	• Gifts and goods sent to family.	• Expanding available liquid assets, also beneficial to community in the long run

Source: Author's Analysis

As in times of economic crisis philanthropy motivates the migrant workers and they send home more money thereby facilitating poverty and inequality reduction (Cordova, 2006). Moreover, due to the significant input to welfare transfers, it is argued that remittances act like a safety net for relatively poor segments of the society (Jones, 1998). A large amount of financial transfers is received by the migrant sending families, from the family members who live and work abroad. As summarized in Table 1 in fact, several studies suggest that the various forms of remittances like bank transfers or in-kind donations perform a very important role in poverty reduction and economic development (World Bank, 2006). Among other factors, such as education, income, health care, plans to invest or to provide protection for the family at home against the risks, length of the stay affects the motivation of the migrants to send transfers.

However, sometimes the migration of a family member may also prove to be unfavorable for the welfare of households. In fact, deprivation of the family from the market and non-market output of the migrant member occurs due to the absence of a family member. Therefore, it is interesting to ask that, for the losses embraced by the family due to migration of the family member, what extent income remittances account for or cover such losses (Borraz, 2005). In migration decisions the main motivation force is the development of migrants and well-being of their families. These efforts can be supported by the remittances through the two main channels. First, by flowing to the poorest population sections, remittances can contribute directly to poverty reduction. Secondly, increased investment in the human and physical capital may also be contributed by remittances by improving the imperfect insurance and financial markets of the developing countries (De Haas, 2007).

For a general over view it is a thought, a notion or a view according to some optimists of migration process that there is a capital investment transfer going on from north to south and these developmentalists also tend to think that this transfer of capital contributes and adds up the exposure to modern knowledge and education, democratic and rational ideas and also speeds up the exposure to modern communities. The migrants who return or remit are investors, innovators and are regarded as important agents of change according to this point of view. In the countries of migrant origin a large amount of money was expected to be invested in the enterprises and so it would generate employment and increase expenditures on welfare. According to the broader view the developing countries would gain a lot from the remittances and as well as their economic take off would be boosted by the knowledge, skills and expertise that the migrants would acquire before returning to the home country (Commander et al., 2004).

As shown in table 2 that in the 1950s and 1960s the policy visions of development were predominated by the state-centrists and nationalists and interestingly from 1970s and onwards this optimistic view has experienced a rebirth and now due to the linkages of remittances with welfare in the migrant sending, mostly, under developed and developing economies, a lot of research and debate is gaining on the possible role of remittances for development.

Table 2: Phases in Remittances and Development Research Policies

Decades	Research agenda	Policy pitch
• Afore 1970s	• Positive views for development and remittances.	• Economic take-off by acquiring knowledge and capital.
• Between 1970s and 1990s	• Due to dependency and brain drain a rise of pessimist view for migration.	• Concerns about brain drain; migration largely out of sight in development field.
• From 1990s to 2001	• More elusive views under the influence of empirical studies.	• Tightened policies for immigration under different specifications.
• After 2001	• Mixed views but generally optimistic views for migration and remittances.	• Brain gain, remittances and diaspora involvement; tolerance for high skilled in the immigration policies.

Source: De Haas, 2007

Among all of the studies that are done previously to assess the impact of remittances on poverty there has been a problem of selection biasedness, along with it there are a relatively few studies that address the relationship between remittances and child schooling or health of the reproductive married women, yet among these few studies biasedness also exists. One of the possible solutions that is also incorporated in this study is to solve the selection biasedness problem by finding a comparison group that has the same observable characteristics like the treatment group, except for one that the comparison group is not receiving remittances. Based on their propensity scores that is their predicted probabilities of receiving, the observed covariates between the treatment group and the comparison group are balanced. In short, it is assured by PSM that the observed characteristics are identical for both of the comparison and the treatment groups.

1.2 Trends of Remittances and Relevance of the Study to Pakistan

According to the recent estimates, the world population living outside their country of birth currently exceeds over 215 million people, or 3 percent of the total world population. According to the Bureau of emigration and overseas employment[1] there are about 439 thousand Pakistani workers registered for overseas employment in 2014. While in 2005 there were only around 142 thousand workers. Moreover in 2014 the most migrated destination was U.A.E and Saudi Arabia constituting of about 90 percent of all the migrated workers. If these workers statistics are compared according to their skill level than it is evident that most of these migrated workers are masons, labourers, drivers, fitters and mechanics. If the provincial statistics are compared than it can be seen that most of these migrant workers belong to KPK and Punjab. A Pakistan migrated worker sends around 1,968 USD per year to Pakistan. From Saudi Arabia around 2,000 USD per year and from US and UK 2,374 USD and 1,267 USD per year in 2014, as can be seen from Appendix Table 2.

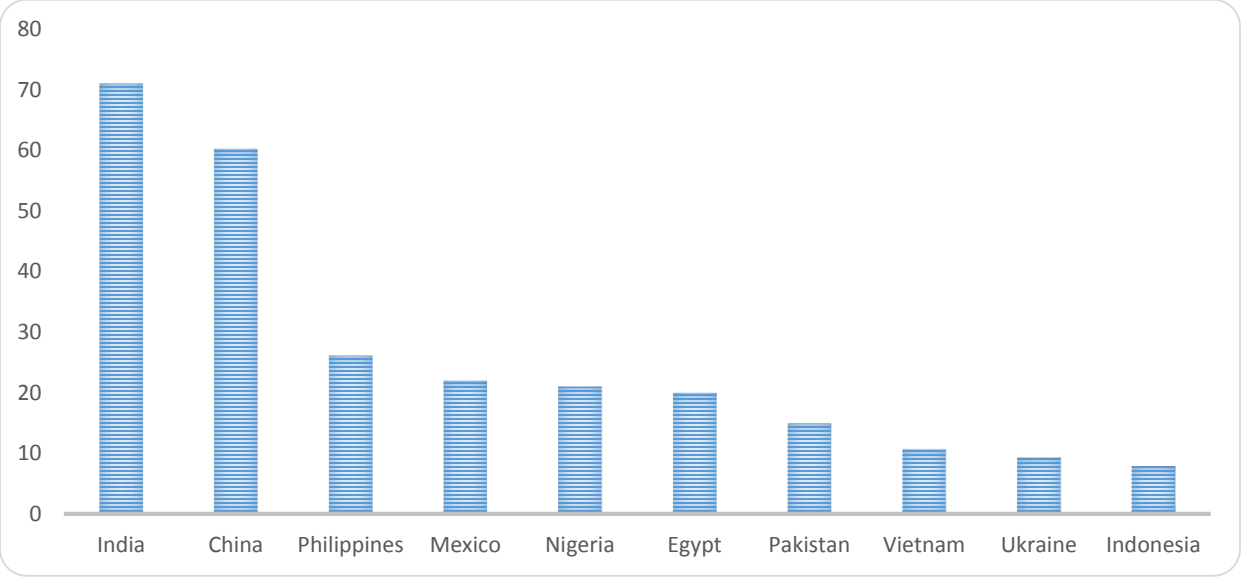
According to the available data from the State Bank of Pakistan[2] the remittances started to climb the thousands of millions figures from the fiscal year 1978 (1156.33 million USD). And with the passage of time these remittances kept on growing and climbed to 4168.79 million USD in 2005 as shown in Figure 1. The other remittances influx boom started from the fiscal year 2010-11 with 11200.97 million USD. In 2012 the growth rate of remittances was 27.3 percent from

[1] http://www.beoe.gov.pk
[2] http://www.sbp.org.pk

Appendix Table 3. The available data suggest flood of remittances for the fiscal year 2012-13 to be 13921.66 million USD. Overseas worker's remittances registered commendable growth during July-May, 2013-14, growing by 11.5 per cent against 6.4 per cent growth recorded in the corresponding period of last year. Remittances from Pakistani workers abroad reached more than 14.9 billion USD during first eleven months of this fiscal year

It is shown in Figure 1 that according to the Migration and Remittances 2014 report of the World Bank, Pakistan ranked 7th in terms of largest recipient of remittances officially registered in the world. The second largest recipient of remittances in the South Asia is Pakistan after India. According to the report of Ministry of Finance, Pakistan is among the 20 countries of the world where funds from remittances cover more than 20 percent of imports and in value terms remittances are also equivalent to more than 30 percent of exports. Main source of remittances flow includes countries like United States, Saudi Arabia, United Arab Emirates, United Kingdom, Kuwait, Qatar, Bahrain and Oman, the Gulf countries. Remittances represent more than 5 per cent of GDP which compares favorably with many developing countries. These transfers often exceed other official foreign exchange sources.

Figure 1: Remittance Receiving Status of Middle Income Countries, 2013 (Billions USD)



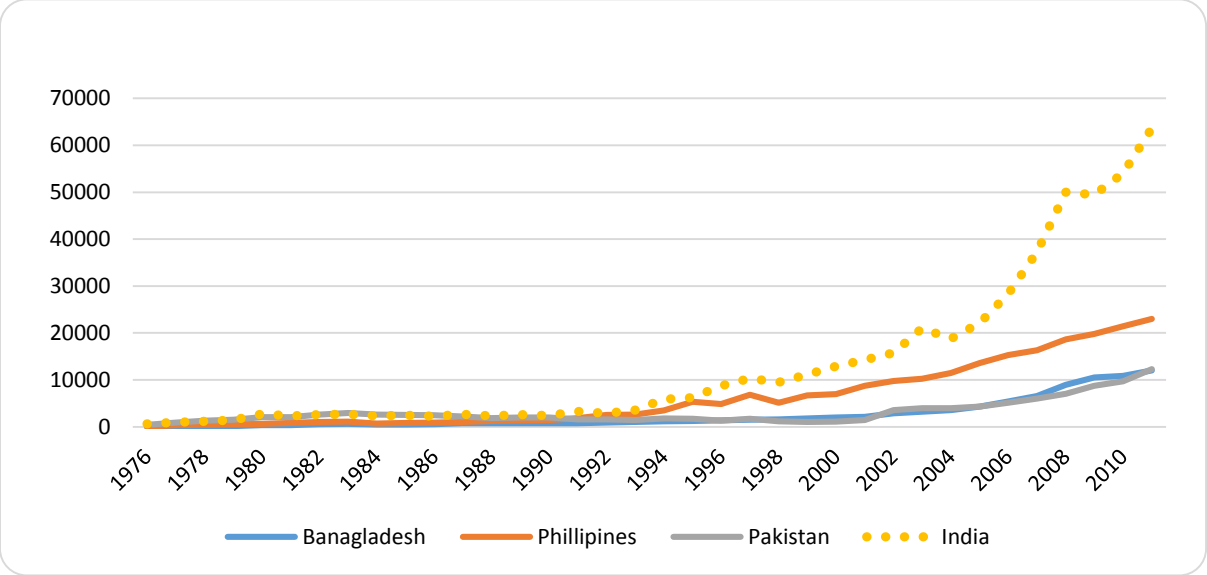
Source: World Bank, Migration and Remittances Report 2014

Millions of Pakistani temporary migrants were involved in the construction boom of 1970s of the gulf region and for the first time remittances to Pakistan took a boom in this period. From these migrants the remittances debut in 1980s, and appeared as the largest source of foreign

investment, outshining exports and constitute up to 10% of GDP. In the late 1980s these flows slowed during the period of cheap oil followed by the weakening of Arab economies in 1990s. The restraining effect on remittances was also observed in the early 1990s due to the Gulf war. After the tragic events of September 11, the second phase of growth of remittances begun in the year 2001-02, and remittances to Pakistan more than doubled. All the major concentration of Pakistanis around the world continues to rise after this phase and onwards and so are the remittances. From Appendix Table 1 it can be seen that in 2008-09, remittances from the United States have increased to more than $ 1.7 billion from only 73.3 USD. While in 2013-14 remittances from USA reached to 2.2 billion USD. Whereas remittances from Saudi Arabia and UAE were around 41 million and 28 million USD[3] respectively.

As shown in the Figure 2 below if the remittances for the developing Asian economies are seen than it would be clear that in Asia most of the remittances are received by the Indian economy, than Philippines, and after that Bangladesh and Pakistan come in this context as the major remittance receiving economies.

Figure 2: Remittances to Developing Asian Economies (in Millions USD)



Source: Remittances data, Development Prospects Group, World Bank, 2011

Despite the fact that official remittances in Pakistan are having a countercyclical pattern on the average, in natural disasters remittances to Pakistan have actually increased. Many

[3]http://www.sbp.org.pk

earthquake affectee's in northern Pakistan in October 2005, due to the remitted support from Pakistani nationals, returned to their normal lives (Suleri and Savage, 2006). However, the formal transfers represent only the tip of the iceberg. Transfer of unofficial funds are almost half of the transfers legally channeled (World Bank, 2006), or may increase in developing countries (Freund and Spatafora, 2005) by adding to official receipts up to 75 percent.

Remittances took a rapid growth in 2001-02 into Pakistan and this is partially credited to restricting the informal transfer channels, known as hundi or hawala (Amjad et al., 2013). Other reasons include the transfer due to the international crisis and uncertainty immediately after the attacks of 9/11, the maturity of Pakistani migrants in North America and the European Union and increase in their numbers, reduction in the cost of transfer of funds, the changing profile of skills and the desire to take advantage of the opportunities offered by the growing economies in the 2000s.

According to available data on remittances in Pakistan, the amount spent on consumption is more than three-fifths of the cash received by transfers. While reducing gender based differences, some consumer spending continues to grow on education and health (Mansouri, 2007). Because remittances are saved and invested, they are associated with an increase in agricultural productivity due to equipment and machinery investment (Kerr, 1996) In rural Pakistan, the propensity to save on transfer income seems more as compared to income derived from other forms (Adams, 1998). Therefore, the message must be that the transfers have a positive effect on consumer spending, including education and vaccination and poverty reduction.

1.3 Scope and Objectives of the Study

There are a lot of studies that have linked the receipt of remittances with poverty, education, health and other welfare indicators around the world. In Pakistan the relationship of poverty and remittances has also been analyzed but there are a very few studies that analyzed the issue of health and education of household in relation to the receipt of remittances.

In a study on remittances and household welfare in Pakistan, Viqar et al., (2010) highlighted the sectoral and macro-economic impacts of remittances by using the general equilibrium and suggested that both the poverty head count ratio and Gini coefficient decline for the remittance receiving households. The study of Nasir et al., (2011) has found that that without taking into consideration the parental education as a control variable in regression than remittances

have an adverse impact on child schooling but if parental education is also included as a control variable than the adverse effect becomes insignificant. Regarding the studies that illustrate the impact of remittances on the health of the family members in Pakistan than there are quite a very few studies. Abbas et al., (2014) using OLS and logit model on the primary data collected from the 9 union councils of Tehsil 18 Hazari, concluded that remittances have a positive impact on the health care expenditure of the receiving households.

The limitation with all of these mentioned studies in Pakistan is that these studies have not taken into account the selection biasedness issue raised by ignoring the observable characteristics of household in the study. My study will tackle this issue by using the propensity score matching technique in which the households with similar characteristics are compared for the receiving or not receiving the treatment. It is the contribution of this study to the existing literature as well.

The study covers the following four objectives:

i. To estimate the determinants of remittances;
ii. To analyze the impact of remittances on headcount poverty;
iii. To analyze the impact of remittances child schooling; and
iv. To analyze the impact of remittances on health;

To fulfill the above mentioned objectives, this study has used the Household Integrated Economic survey 2010-11 conducted by Pakistan Bureau of Statistics (PBS). All the four provinces including the rural and urban regions are covered under this dataset and it has comprehensive segments on the household, socio-economic and demographic characteristics including the information on household roster, educational status, health and household income and expenditure. The household welfare is defined by the poverty, child schooling (current school enrollment of children and type of institution admitted) and the health status of reproductive married women in the household (prenatal care, immunization status and place of her child delivery).

1.4 Hypothesis

- H_{01}: Remittances have no impact on poverty after controlling the selection biasness.
- $H_{02:}$ Remittances have no impact on child schooling after controlling the selection biasness.
- $H_{03:}$ Remittances have no impact on the health status of reproductive married women after controlling the selection biasness.

1.5 Significance of the Study

Pakistan is among a few countries that received a large amount of remittances and has been ranked at 7th position[4] by remittance receiving status among the middle income economies. Remittances are the second largest source of foreign income for Pakistan after exports. And their behavior is stable and countercyclical during natural disasters and emergencies.

Poverty in Pakistan has always been higher in rural areas and lower in cities and therefore so is the unsatisfactory state of education and health care. Amongst a total of 40 million people living below the poverty line, 30 million live in rural areas. Poverty has risen sharply in rural areas in the 1990s and the income gap between urban and rural areas of the country has become more imperative, creating problems for education and health care. This trend has been attributed to a disproportionate impact of economic events in rural and urban areas.

At the world wide level and also at the national level there is an extensive literature available on the impact of remittance flows on poverty status. But for the relationship or influence of remittances on child schooling and health status of household there are quite a few studies to mention in case of Pakistan like [Abbas et al., 2014; Nasir et al., 2011]. Though almost all of the earlier studies concluded that remittances have a positive impact on household welfare directly through increasing income/consumption levels and through capital increase, resulting in higher levels of output growth and employment generation in the economy. But all of these studies have the problem of selection biasedness. The way that this study is tackling this problem is the propensity score matching in which the observable characteristics of the treated and control variables are taken into account while computing the welfare effect so that there are no chances of biasedness in the results. This study is an attempt to contribute to the literature on the links between

[4] econ.worldbank.org

household welfare and remittances, providing evidence of Pakistan and also adjusting for biasedness in selection.

1.6 Organization of the Study

The organization of the rest of the study is as follows. In the second chapter an in-depth review of the literature is included from the previous wide-reaching journals and research papers and an international perspective about the relationship between remittances and household welfare is tried to be analyzed. The third chapter of this study involves the analysis of the data and an effort is put to understand the data organization. After this the methodology of the propensity score matching is discussed in this chapter.

A comprehensive bivariate analysis has been carried out in the fourth chapter, here the cross tabulation of all the key variables that are related to the receipt of remittances and also have effect on the household welfare. At the same time the findings have been explained appropriately in the corresponding tables to create an ease for the reader to understand the findings of this analysis.

Chapter five of this study is the extension of the chapter four, in which a multivariate analysis i.e. a propensity score matching has been done to conform to the bivariate results and to define the possible relationship between remittances and household welfare indicators. Chapter six of this study includes the conclusion drawn from the results and policy recommendations have been suggested on the basis of the results.

CHAPTER 2

REMITTANCES AND POVERTY: REVIEW OF THE LITERATURE

Remittances are one of the tools that have been known to stimulate development and in times of economic distress these act counter-cyclically. In fact it can be said that remittances are non-debt generating mechanisms, creating the safety nets that are run by families and communities (Brown, 2006). During the past decade and especially during the natural disasters remittances to Pakistan are seen to be increased. However, official transfers represent only the tip of the iceberg, up to 50% of recorded flows could be the cash shipments of unofficial remitted funds (World Bank, 2006). Available data indicates that most remittances to Pakistan are engaged in consumption, and a portion of this consumer expenditure is spent on health and education. However, propensity to save on funds received in rural areas of Pakistan appears to be much higher than as compared to the other sources of income (Adams, 2002). The well-being of households is improved by the remittances in a way that their income and consumption is increased by the receiving of transfers. The available evidence also suggests that by the increase in the incidence of receiving transfers, investment on education and small businesses is also increased (Edwards and Ureta, 2003). For example, by receiving remittances some of the financial difficulties faced by households and small businesses that do not allow them to invest may be removed. Thus, in this context, the high rate of accumulation of capital can be induced by remittances and the long-term growth potential of the country is also enhanced. According to the proposal of Ratha (2007) "Income of the recipient household is directly increased by remittances. They affect poverty and prosperity through indirect multiplier and also macro-economic affects in addition to providing funds for poor households."

Studies like Anyanwu and Erhijakpor, (2010) also showed that income of the receiving families is increased by receiving international remittances and the recipient country's foreign exchange resources are also improved. If the international remittances are invested than growth and development can be increased and if the amount received is spent on consumption, the positive multiplier affects are generated. Remittances can also serve as an insurance policy against the risks likely associated with the new production activities. Mainly, consumption and investment in human capital (education, health and nutrition) are the main uses of remittances. Investments in housing activities, land and cattle is also relatively common, but secondary to the daily needs and requirements related to human capital development. Insurance against crop failures may also be

provided by remittances, besides protection against income shocks (Yang and Choi, 2007). But there impact on poverty will be low or zero with worsened inequality if the remittances are mostly received by the higher segments of the society (Rodriguez, 1998).

In the economic literature, there are studies that establish the relationship between remittances and household welfare using cross-sectional and time series data such as the relationship between remittances and growth, and the relationship between remittances and poverty. Although these studies do not adjust for the propensity score and have biasedness in selection, there are relatively few studies that do a check for selection bias. The main objective of this chapter is to examine the relationship between remittances and poverty, followed by the relationship of the former one with education and immunization or health care.

The supportive impact on poverty and inequality reduction is greater when remittances are assumed to be exogenous additions. In an exogenous model of remittances, poverty drop is overstated, when remittances are assumed as an additional exogenous income. Using the results of earnings estimates for the selection controlled households that are not receiving payment (even if there were no evidence of selection), Acosta et al. (2008) estimated the hypothetical or counterfactual income for households receiving remittances. They included error components that were derived from the selection equations, to account for the artificially predicted less volatile income compared to the actual one. No evidence of adverse selection, in all countries except for Ecuador in which there was no selection evidence, was found in the results of the selection of immigrant families in their unobservable characteristics. In his study of Mali, Gubert et al (2010) while using the double selection method, found that when the migrant families are negatively selected, international remittances lead to a decrease in the proportion of poor from 0.49 to 0.46, however no significant effect on inequality was found, these results were observed for the data where 20 percent of the sample received international remittances (Gubert et al., 2010).

The level, depth and severity of poverty is reduce by the transfers of domestic and international funds (Adams, 2006a). However, he finds that in reducing the severity of poverty remittances have a greater impact rather than on the level of poverty in Guatemala. When internal remittances are included in household income, the squared poverty gap falls by 21.1 percent and 19.8 percent when international remittances are included in income. This is because a large portion of the remittances is incorporated in total household income (expense) of the households in the

lower most decile group. Between 50 and 60 percent of the total income (expense) is received from remittances by the households in the bottom decile group (Adams, 2006a).

Using OLS and the method of counterfactual estimate in Ghana, Adams (2006b) estimates a consumption function for non-remittances recipient households. Treated as an exogenous transfer, he argued that, on international poverty the effect of remittances is generally low. Also found that due to the international remittances, the proportion of the head count increased from 0.33 to 0.39, while the squared poverty gap decreased from 0.10 to 0.7. However there was no change in the proportion of the Gini coefficient and the poverty gap.

But it can also be seen for some of the cases that remittances on the margin are growing inequality across the country, although there is difference in per capita incomes between rural and urban areas. In rural areas, , inequality is increased by remittances because incomes are low, while in urban areas though the effect is not significant, remittances are declining inequality, because income is relatively high (González-König and Wodon, 2002). However, this analysis also shows using the method of decomposition, that there are greater effects on poverty reduction for the regions with the higher level of migration. Establishing that remittances have a statistically and economically significant impact on reducing poverty in Mexico at the municipal level, the linkage between remittances and poverty indicators was analyzed by López-Córdova (2005). He estimated that in the proportion of transfer-recipient households an increase of one percentage point in a municipality significantly reduced the fraction of the population that has relatively low income earnings.

Squared poverty gap index is another method used by some authors to evaluate the association of remittances to poverty. By using this method, poverty status is determined in a given area. This method puts more emphasis on observations that are far from the poverty line rather than those that are closer by squaring the poverty gap for each individual / household (Munzele and Ratha, 2005). There results showed that "international transfers of remittances through the official channel reduce poverty in the developing world," but note that "in South Asia, official transfers have no statistical impact on the level and depth of poverty". While during evaluation they find that total transfers reduce poverty in South Asia after adding up estimated unofficial elements of remittances to official ones.

There are also some studies which reach the conclusion that global transfers worsen inequality, but there are great differences between the regions. In Mexico, Midwest, remittances have the equalizing effect where the prevalence of migration is higher, while in the southeast remittances have the greatest unequalizing margin effect where migration is less. Similar result was observed for the poverty. Using the decomposition method, Taylor et al. (2005) predicts that, although the overall effect is a reduction in poverty, there is a significant difference in magnitude across regions depending on the incidence of migration. Using data on international migration, remittances, inequality and poverty in 71 developing countries, the impact of international migration and remittances on poverty in developing countries has been reviewed by Adams and Page (2005). Using the basic growth-poverty model suggested by Ravallion their results show that due to international migration and remittances the level, depth and severity of poverty in the developing world is decreased.

On poverty and inequality, there are conditional effects of remittances, which depend largely on the maturity of the migration process and its incidence and, more importantly, how in this process the lowest income earning segments of society are involved (Acharya and González, 2013). In addition, payment of the remittances from India, which on average is much lower than as compared to the payments from other countries, are inequality decreasing and has the greatest impact on reducing poverty. This is due to the increased participation of the poor in the migration process from Nepal to India.

Using two rounds of the nationally representative sample survey of living standard measurement of Nepal Acharya and González, (2013) assessed the impact of remittances on poverty and inequality by estimating a function of household consumption using simulation method. Simulations indicate that nationally remittances reduce poverty head count by 2.3 percent and 3.3 percent in the first cycle of the survey, and between 4.6 and 7.6 percent in the second round. Furthermore remittances reduced the depth (at least 3.4 percent and not more than 10.5 percent) and severity (at least 4.3 percent and not more than 12.5 percent) of poverty.

In Pakistan, there are also studies that have revealed the relationship between remittances, poverty and growth by using different techniques like the CGE model. CGE modelling is widely used to analyze distributional effects of policies whose effects can be transmitted across multiple markets, or contain options list of fiscal instruments, subsidies, quotas or different transfers and

the general welfare. A study by Siddiqui and Kemal (2006) using a CGE model found that the income gap between urban and rural households is reduced by trade liberalization and international remittances, but for urban households the welfare gain from trade liberalization and remittances is higher as compared with households in the rural areas.

Mughal and Diawar (2010) analyzed the impacts of remittances on poverty and inequality while classifying the remittances to Pakistan with respect to payments from the principal regions, namely North America, the Persian Gulf and the European Union. The results of simple OLS regression show that by taking income and consumption inequality as dependent variables, in Pakistan there is a significant negative impact on poverty and inequality of the transfers from the Middle East. The impact of remittances on inequality is less in magnitude as compared to the magnitude of reduction in poverty, while the decrease in inequality of income is more than the decrease in consumption inequality. This general macroeconomic evidence is confirmed at the micro level by using the 2001-02 and 2005-06 household survey data. Another study in Pakistan representing the importance of remittance flows and their impact on economic growth and poverty reduction in Pakistan is by Javid et al., (2012). They used the ARDL approach and analyzed the impact of remittances inflow on economic growth and poverty in Pakistan for the period 1973-2010. The analysis of the district wise poverty suggested that in the districts of Punjab, Sindh and Baluchistan external migration contributes to the reduction poverty, however in KPK a clear picture was not portrayed. In the long term, the influx of international transfers can lead to sustainable growth and improving the welfare and gradation of poor households, as the impact of remittance funds expand and expand over time. However, the World Bank report indicates that; in an economy like Pakistan, remittances tend to reduce poverty, increase health and education spending by the households and have a slight impact on the decrease in inequality of incomes (World Bank, 2006).

All the studies described above if done in the case of Pakistan or internationally, biasedness has been the problem of selection. These studies have not verified the fact that households receiving remittances and households that are not, do not share the same characteristics regarding household. So to tackle this problem in the statistical analysis of observational data, "the PSM is a statistical technique corresponding to estimate the effect of the treatment, while accounting for the covariates that forecast treatment of the variables and attempts to reduce bias due confounding variables that might be found on an estimate of treatment effect obtained from a simple comparison

of the results between the units that received treatment compared to those which did not" (Ravallion, 1994).

The probability of being in capabilities based and food based poverty of a household is reduced by 6 and 8 percentage points by the instance of receiving funds, irrespective of the amount (Esquivel and Alejandra, 2006). This effect is equivalent to a reduction of about 30 percent and 50 percent in the rate of poverty for poor households receiving transfers vis-à-vis the non-receptor households if the senders belong to the Mexican population. However, the receipt of funds is not likely to influence the poverty based on assets. In this sense, remittances only up to a certain extent help to reduce the level and depth of poverty.

The influence of the recent wave of migration on the incidence of poverty among those who remain in Ecuador was analyzed by Simone and Marchetta, (2014), using household data providing information on migrants in regard to age, sex, level of education, years of migration and country of destination. Using PSM they identified the effects of migration and remittances on the incidence of poverty among those who remain. Their study shown that the migration wave that was triggered by the economic crisis of the late 1990s in Ecuador resulted in a decrease in the prevalence of poverty among migrant households, estimated between 17.4 and 20.8 percent, it may also reflect a positive selection on unobservable.

Now regarding education, several studies have been carried out on the educational outcomes of family members and how remittances and migration experience affect these results. A stream of literature has shown that the improvements in liquidity constraints due to receipt of remittances increase the educational attainment of family members (Borraz (2005), Yang (2008)). Remittances promote investment in education by alleviating household liquidity constraints. Having a reflux from the opposite school of thought that, the migration of a family member that is, the absence of a mother or father declares negative impact on the child's education while recognizing that it increases the potential for remittances to alleviate credit constraints and increase the educational level of the children (Park et al., 2010). Other studies have other aspects of how influential are the transfer of funds to a child's education, including the positive and negative incentives of migration and remittances in this respect are examined, provided left behind, on the education of members of the family.

A large number of the existing literature shows that due to the removal of liquidity constraints, there is an increase in educational outcomes, for the family members left behind. Remittances promote investment in human capital by increasing the budget constraint of poor families. Empirical research on remittances and education has defined the potential of remittances for increasing the ability, of families emphasized, to pay for school raises the level of education. Examples from the literature are to be found that prove the notion as Cox Edwards and Ureta (2003), in El Salvador the probability of the children leaving school is reduced by remittance receipts, principally in rural areas. Cordoba and Lopez (2006) found a higher degree of literacy and school attendance among 6-14 kids for the municipalities of Mexico that receive more transfers. Borraz (2005) found there is an increase in the chances for the children to complete more years of education if living in households that receive transfers, than other children from the non-recipient families and that the effect is statistically significant for more than one year. There are more likely to be the chances for the extension in the school years or education for the children living in households that receive funds. Yang (2008) found that in Philippines the migrant families who receive greater positive impact on the exchange rate there is more education for the children of such migrant families.

It may be required from the child that he/she may take on the tasks normally performed by the parents due to the absence of a migrant parent, such as participating in a family occupation or chores. To meet the restrictions of short-term liquidity of household's children may also have to work since it may take some time for the migrants to make money and remit. All of these activities are also consistent with the child (or the parents) not appreciating the evaluation of school due to future plans of migration. This impact is the summation of three main effects: the effect of the transfers received on the likely amount of the investment in education which is probably to be positive when the liquidity constraints are obligatory; after migration the effect of having absent parents from the house resulting in the more house and farm work by the remaining members of the family including children and perhaps less parental input in the educational achievements; and the effect on the desired amount of education due to the migration plans, which is more likely to be negative (McKenzie and Rapoport, 2006).

In the study of Pakistan Nasir et al., (2011) considered the impact of remittances on school performance. From the four major cities of Khyber Pakhtunkhwa, Pakistan primary household level data was collected. OLS results show that, regardless of parental education, there are

significant negative impacts on the performance of the children in school due to remittances. However, the effect becomes insignificant when as a control variable parental education is included in the regression. The results also show that in the academic success of children, an important role is played by the low levels of parental education, current income, assets, family type and family size. Hanson and Woodruff, (2003) show that the occurrence of migration by removing children from the presence of guides and models may disrupt household structure, and require that the additional responsibilities in the households are to be taken by the elder children. They also note that if the parents experience the adverse impact of labor market than it will be leading to a negative relationship between educational attainment of children and migration in a way that the parents will opt for migration and the children instead of spending time in school will have to work. There may exist a negative impact on school achievements of children because of the migration of the household head as it can disturb family life. Mansoor and Quillin, (2007) debate that less supervision is received by the children of immigrants and thus these children lag behind in their education development. For example, it has been proposed that in Moldova and Bulgaria an important factor in reducing the number of students, is the migration process as the lack of control and the influence of parents can affect the performance of their children in school; the role of the absent parent cannot be properly played by any other family member.

Among the Egyptian girls Wahba, (1996) finds proof of this negative relation by using a simple OLS technique. For the households with migrants in Mexico McKenzie, (2007) measured substantial shrink in the level of education for the children in such households. Lucas, (2005) argued that money from overseas relatives, especially parents, continues to support children's education at home, but the learning outcomes can be ruined if the parents are overseas and therefore no attendant on the academic achievement of children at home. Park et al., (2010) argue that especially boys are more likely to leave school as the development of children is negatively affected by the migration of parents. Castaneda & Buck (2011) claim that there can be important consequences for children's development in the long term as vulnerable children are left without greater protection of physical, psychological or emotional exchange, which is often a compromise undertaken for the sake of greater financial protections of the children through remittances.

Another channel through which migration can improve the educational outcomes or performance is suggested by the theoretical and empirical literature on the “beneficial brain drain" or "brain gain". The basic idea of these theories is that during migration, education has a high

performance, and thus the expected return to education prospects are increased by expectation of future migration, and hence increase in the school induction (Commander et al., 2004; Beine et al, 2007). Recently, there has also been some attention to the fact that further training of those who remain in the country of origin is motivated by the emigration of highly skilled specialists of the same particular fields. In such perspectives, as in the Philippines, a high level of college adults undoubtedly motivated refresher training in the Philippines and even influenced the choice of area of study due to the high migration rate of college students.

Many studies have looked on the fact that when household members are prepared to migrate more, than they are going to channel remittances to education and ultimately human capital formation, which is favorably exported to the host countries (Vidal, 1998). For example, McKenzie and Rapoport, (2006) show that people prefer to leave school earlier and start working in the country of origin or try to migrate if they expect that their academic qualifications cannot be exported to the host country.

In addition to the impact on performance in the field of education, in particular for children, the importance of remittances to countries of origin is measured for the beneficiaries of transfer's assistance in terms of improving health or vaccination. Remittances by purchasing improved health facilities and nutrition help to improve health care and immunization, as expected. Now to review the studies on the impact of remittances or transfers on the health care or immunization of the recipients it is best to start from the production function for health by Grossman, (1972), according to whom improving outcomes for children's health care and improving child nutrition are the contributions that remittances can make for the recipients, while health of the child is affected by the phenomenon of migration firstly by the health knowledge acquired from abroad and practiced in the communities of origin and secondly by the fact that the parents who migrate tend to spent less time with their children which can also affect their physical and emotional health.

A positive impact of migration on the health of migrant households is found by Hildebrandt and McKenzie, (2005) by comparing the increasing birth weight, and the reduction of infant and child mortality with the increase in cash and social transfers received by using data from the national representative population survey and evaluation of the hypothesis by 2SLS estimation technique. They found that the better understanding of health requisites can be provided by migration process through the experience gained from abroad. First possibility is enabling

households to devote more resources to food and medical services by the direct impact of migration on income and wealth through remittances and repatriated savings. Secondly from the experience gained as a result of being in contact with the practices of the country of destination workers can learn about health, which thus results in achieving higher health by the more efficient use of financial resources. The health consequences of migration are influenced through these two mechanisms: it increases both wealth and health knowledge of the migrants. In one study Dorantes et al., (2011) simulated the effect of remittances for Mexican families on the cost of health care by using a set of representative data at the national level, while taking into account the discrete and continuous nature of costs of health care and the possible endogeneity of remittances. To calculate the expected return levels of household income during the quarter, they firstly estimated the Tobit model, since remittances may be endogenous to health spending. Instead of the household income these forecasts are used in the valuation models of two-part instrumental variables of health care costs. They found an increase in the likelihood of incurring costs of health care and the level of expenditure remittances by the incidence of receiving transfers. In particular, for every hundred pesos received in the form of remittances, six pesos are spent on health care.

Conversely, while using data from the Mexican Migration Project, Kanaiaupuni and Donato, (1999) found a negative impact of migration and remittances on children's health, and in particular the separation from family may be associated with devastating consequences like the increase in infant mortality, however these destructive effects were observed at the initial stage of migration. In the long term, infant mortality is significantly reduced by remittances. Using hierarchical linear (HLM) methods they detected that the origin of migration alters the normal activity of the community as a growing number of healthy workers leave the labor market for employment and mortality levels of children increase. Over time, however, migration brings positive changes to the standards of living change and child survival possibilities increase as it becomes an institutionalized part of local life.

Regardless of the contradictory outcomes on the nature of the relationship between remittances and well-being of households, many results of the empirical literature show that remittances reduce poverty and inequality and contribute to programs of education and increase in household health care in many developing countries with low and middle incomes.

CHAPTER 3

DATA SOURCES AND METHODOLOGY

3.1 Introduction

Remittances have a significant impact on poverty reduction, while the receiving households also opt for the private schooling for their kids in search of quality education, increasing current school enrollment and along with this a positive impact for the health status of the reproductive married women is also observed. Thus remittances play a crucial role in the formation of human capital. This chapter provides the description of the data and methodology used to link the receipt of remittances with its impacts on the state of poverty, child schooling and health care. Section 3.2 of this chapter gives data description of this study, section 3.3 explains methodology and the last section gives conclusion of this chapter.

3.2 Data Description

This study has used the Household Integrated and Economic Survey (HIES)-2010 dataset to analyze the impact of remittances on various indicators of household welfare including poverty, child schooling and health. The 2010 HIES covers 16,341 households which is a sub-sample of district level Pakistan Social and Living Measurement Survey (PSLM)-2010; it covers near to 77,000 households in 2010. HIES is a nationally representative survey draws a representative sample covering all geographical parts of the country using a two floors of stratified sampling design while recording the information on national and international remittances separately. The villages and mouzas in the rural areas and the urban blocks are taken as the Primary sampling units (PSUs) whereas the households within these primary sampling units are taken as the secondary sampling units (SSUs), shown in Table 3. The total primary sampling units for all the provinces and regions are 1180 while the secondary sampling units are 16,341.

HIES, the sub-sample of PSLM is a provincial level representative survey which along with the data on consumption expenditure and consumption pattern, covers important information on household income, savings, liabilities. HIES also contains information on variables such as household demographic characteristics, education, remittance receivers, revenues and expenses of the individual.

Table 3: Profile of the sample from HIES 2010-11

Province/Area	Sample PSUs			Sample SSUs		
	Urban	Rural	Total	Urban	Rural	Total
Punjab	256	256	512	2935	4019	6954
Sindh	152	144	296	1802	2296	4098
KPK	88	120	208	1041	1913	2954
Baluchistan	68	96	164	811	1524	2335
Total	564	616	1180	6589	9752	16341

Source: HIES 2010-11 Data Report

HIES is a nationally representative survey, which draws a representative sample covering all geographical parts of the country using two floors of stratified sampling design. Both the national and international remittances are given, however, in this study only data on international remittances was used to perform the analysis. According to this data[5] there are no significant differences between rural and urban households in household specific variables with the exception of the education of the household head and household size level. Households in the urban areas are more educated than householders in rural areas. Similarly, the family size in urban areas is smaller than the size of the family in rural areas. For the households that receive funds, the average income is just over two times higher than average income households that do not receive remittances.Poverty is estimated with the available information from HIES. By using the food and non-food consumption expenditure information as given in HIES dataset the official poverty line in Pakistan is calculated. The details of constructing the poverty estimate are given in methodology section. Regarding the child schooling the information for the children aging (5-15 years) is given in the HIES 2010-11 data set from which the variables like current school enrollment and the type of institution in which the child is admitted are picked. And as far as the study of health status of household is concerned, for this the health status of the reproductive married women (15-49 years age) is studied from the variables like prenatal care, immunization and place of child delivery.

3.3 Methodological Framework

The objective of this study is to estimate the impact of remittances on household welfare in Pakistan. It can be seen from Table 4 that in this study, three types of household welfare is taken; that is poverty, child schooling and health status of the reproductive married women of age 15-49. Before explaining the methodology, it is necessary to explain the construction of official poverty

[5] HIES 2010-11 Report

line, child schooling and health status of reproductive married women used in this analysis. The study has used both the food and non-food consumption expenditures to estimate official poverty line. Monthly expenditures have been estimated and to get adult equivalent per capita expenditure, monthly expenditure is divided by the weighted household size in which household members with age less than 18 will be assigned a weight of 0.8 while the members with age 18 or above are be assigned weight of 1. This will give us adult equivalent per capita expenditure.

Table 4: Household Welfare Defined in the Study

Household Welfare	Indicators	Measurement of Variable
Poverty	Head Count Poverty	2,350 Calories per Day per Adult Equivalent (1745 PKR). (Yes=1)
Child Schooling (Age 5 to 15 Years)	Current School Enrollment	Whether the Child is Currently Studying in Any School or Not. (Yes=1)
	Type of Institution	Whether the Child is Studying in Private School/Exam or Govt. School/Madrassa. (Private School=1)
Health Status of Reproductive Married Women (Age 15 to 49 Years)	Prenatal Care	Did She Consult Anyone During Last Pregnancy (Yes=1)
	Immunization	Immunization Injections During Last Pregnancy (Yes=1)
	Place of Child Delivery	Whether in Hospital (Govt. or Private) or Home. (Hospital=1)

Source: Author's Analysis

Now to find poverty; this adult equivalent per capita expenditure is matched with the official poverty line of 1745 PKR for 2010 which is calories based poverty (2350 calories) per day per adult equivalent. Households whose adult equivalent per capita expenditure fall below the official poverty line are treated as poor households. While 12.4 percent official poverty is estimated at the national level; it is 7.1 percent for urban areas and 15.1 percent for rural areas.[6] As this poverty line is estimated at the household level, the sample size is 16,341. Now as far as the sample of the school going age children is concerned it is 32,888 children with ages between 5 to 15 years. Among these ages male children are 53 percent and women children are 47 percent. For the child schooling there are two indicators used in this study, firstly current school enrollment variable in which this study concluded that whether the child is currently going to any school or not (Yes=1)

[6] http://finance.gov.pk/survey/chapters_14/15_Poverty_Social_Safety_Nets.pdf

and secondly the type of institution variable in which the study concluded that in which type of institution the child is going, that is, whether the child is going to any private school/exam or any govt. school/madrassa (Private school=1). The sample of the reproductive married women is 6760. Now for the health status of the reproductive married women in the house there are three indicators; first prenatal care that did she consult anyone during last pregnancy (Yes=1), secondly immunization in which it is established that whether she received immunization injections during last pregnancy (Yes=1), and thirdly place of child delivery in which it is established that whether the child was born in hospital (Govt. or Private) or home (Hospital=1).

3.3.1 Methodology: A Note on Propensity Score Matching

A number of studies have estimated the impact of remittances on poverty, education and health status by using both the micro and macro datasets [Beine et al., (2007); Yang, (2008); Acharya and González, (2013); Suleri and Savage, (2006)], but a major drawback with these studies is the potential biasedness estimation. The core issue is that the remittances may affect selective regions and households rather than all the households. Here we called these households as the "treated" or "participants households". Obviously remittances may affect the treated households positively; it may also indirectly raise the welfare of non-participants, depending upon the nature of the project that how much it generates the spillover effects by transferring the knowledge from the participant unit to non-participant unit.

As the main objective of this study is to estimate the possible impact of remittances on head count poverty, child schooling (current school enrollment and type of institution) and the health status of reproductive married women (prenatal care, immunization and place of child delivery). And there are two types of households that are incorporated in this study, the participants i.e. those who receive remittances and the non-participant households i.e. those who do not receive remittances. It would be not appropriate to compare these two types of households without taking into account their observable socio-demographic and economic characteristics. The objective of this study is that to know the welfare of the participant with and without receiving remittances i.e. treatment. However, but both outcomes for the same households cannot be observed at the same time. While taking the average score for non-participating households as a proxy is not desirable for participants and non-participants as these generally differ on socio-economic characteristics,

even in the absence of treatment or program, known as "selection bias" (Caliendo and Kopeining, 2008)

One of the possible solutions to solve the selection biasedness problem is to find a comparison group that has the same observable characteristics like the treatment group, except for one that the comparison group was not included in the program (Rosenbaum and Rubin, 1983). Based on their propensity scores that is their predicted probabilities of receiving, the observed covariates between the treatment group and the comparison group are balanced. Iin short, PSM (Propensity Score Matching) also assures that the observed characteristics of the comparison and the treatment groups are identical (Ravallion, 2003).

As noted earlier, on the basis of status of remittances, the receivers (treated) and the non-receivers (non-treated), two groups were identified in the HIES 2010-11 dataset. On the basis of their propensity scores the treated units are matched with the non-treated units. The difference between the two groups will then be attributed to the receipt of remittances. The critical assumption that is made in this study is that the decision to be treated i.e. receiving remittances ultimately depends on the observable characteristics. However, since propensity score is a continuous variable, the effect calculated through ATT (Average Treatment Effect on The Treated) is not obvious immediately. Four different methods have been suggested in the literature to overcome this problem; NN (Nearest Neighbor) Matching, Radius Matching, Kernel Matching and Stratification Matching (Becker and Ichino, 2002).

Among these methods, the simplest method is the nearest neighbor (NN) where initially each treated unit is matched or is in a paired correspondence with the controlled entity which has the closest propensity score, with replacements in the controlled units usually. The difference between each pair of units is calculated and identified ATT is obtained as the average of all the calculated differences. In the kernel method, all units treated are matched with a weighted average of all untreated units, using weights that are inversely proportional to the distance between the propensity scores of treated and untreated. A set of intervals or strata are created in the stratification matching while dividing the range of variation of the propensity score in strata within each interval, the treated and untreated units have the same propensity score on average (Rosenbaum and Rubin, 1983). The risk of bad matches may be faced by the NN method, if the nearest neighbor is at a much distance. By imposing a tolerance level of the maximum distance of propensity score such

risk can be avoided (Radius / bracket matching). Therefore, a form of imposing a common support is provided corresponding bracket, where the bad matches can be avoided while increasing the matching quality. However, estimates of the variance increase, if fewer matches may be carried out (Caliendo and Kopeining, 2008)**.**

Now the Propensity Score Matching approach will be used to analyze the impact of remittances on welfare among households. According to this methodology, using a propensity score approach, remittance-receiving households will be matched with households having similar characteristics (household size, age, education, gender and marital status) and don't receive remittances. Once we have matched households in this manner we are able to compute the effect of remittances on the probability of being in a situation of poverty. This effect takes the form of an "average treatment on the treated" effect, where the treatment is taken as whether a household receives remittances or not.

We estimate the propensity scores on the basis of the following model:

$$rem_i = \alpha_0 + \alpha_1 I_i + \alpha_2 hh_i + \alpha_3 Rg_i + \varepsilon_i$$

There are three sets of explanatory variables on the right hand side of the model i.e. the major reasons that why a household may need remittances. These are (a) individual characteristics like gender of household head, education of the head, age of head, age square of head, (b) household characteristics like household size, dependency ratio and (c) regional characteristics like provinces and regions. Since it is a fact that the welfare of household is a multidimensional phenomenon, in this study the welfare impact of remittances is estimated using the following four indicators i.e. poverty, child schooling (current school enrollment, highest level of education achieved and type of institution), and health status of reproductive married women (pre-natal care during last pregnancy, immunization and the place of childbirth. The square terms have been used to model any type of non-existent linearity.

After calculating the propensity scores for each household in the data than the techniques such as NN method, Kernel method, Stratification method and Radius method are applied to estimate the ATT (Average Treatment Effect on the Treated) on the effect of remittances on the desired variables or coefficients.

Remittances are measured as the monthly average income that is received by the household as transference from abroad. The basic idea is to assume that receiving remittances is similar to a

"treatment", so that we may estimate an average treatment effect on the probability of being in poverty. In this way, we want to compare the probability of being in poverty for remittance-receiving households versus that for not remittance receiving households. The difference will then be attributed to the existence of remittances. The critical assumption that we are making in using this methodology is that the decision to be treated (i.e. receiving remittances), although not random, ultimately depends upon observable variables. Notice that this assumption is less strict than assuming that migration depends on observables. The estimation of an average treatment effect in observational studies can produced biased results when we use a non-experimental estimator. The typical problem in this type of studies is that the assignment of subjects to the treatment and control groups is not random and therefore the estimation of the average treatment effect is usually biased as a result of the existence of confounding factors. For that reason, the matching between treated and control subjects becomes difficult when there is an n-dimensional vector of characteristics. One way to address this problem is by using the propensity score matching method which summarizes the pre-treatment characteristics of each subject into a single index variable, the propensity score, which is then used to generate the matching. The basic idea behind the propensity score is that we may reduce the bias if we compare outcomes of treated and control groups which are as similar as possible.

The propensity score is the probability of assignment to treatment conditional on pre-treatment variables:

P (C_i)= Prob $(T_i=1|C_i)$ = E $(T|C_i)$ … … … … (1)

Where P (C_i) = F (h (C_i))

F (h (C_i)) can have a normal or logistic cumulative distribution.

T_i= 1 if the household has received assistance and 0 otherwise.

C_i is a vector of pre-treatment characteristics.

Before estimating propensity scores, two conditions must be met to estimate the average treatment on the treated (ATT) effect, based on the propensity score (Rosenbaum and Rubin, 1983).

Balancing Hypothesis

The first condition is the balancing of the pre-treatment variables, given the propensity score. If p(C) is the propensity score, then:

$T_i = C_i | \text{p}(C_i)$ … … … … … … (2)

If the balancing hypothesis is satisfied, the pre-treatment characteristics must be the same for the target and control groups. In other words, for a given propensity score, exposure to treatment is a randomized experiment and, therefore, the treated and non-treated units should be, on average, observationally identical.

Un-confoundedness

The second condition relates to un-confoundedness, given the propensity score. Suppose that assignment to treatment is unconfounded, i.e.

$Y_1, Y_0 = T_i \mid C_i$

$= T_i \mid \text{p}(C_i)$ … … … … … … (3)

If assignment to treatment is unconfounded, conditional on the variable's pre-treatment, then assignment to treatment is unconfounded given the propensity score. Using Equation 1, the propensity scores are calculated using logistic regression, and the ATT effect is estimated as:

$\text{ATT} = \text{E}(Y_{1i} - Y_{0i} | T_i = 1)$

$= \text{E}(\text{ATE} | T_i = 1)$

$= \text{E}\{\text{E}(Y_{1i} - Y_{0i} | T_i = 1, \text{p}(C_i))\}$

$= \text{E}\{\text{E}(Y_{1i} | T_i = 1, \text{p}(C_i))\} - \text{E}[\text{E}\{Y_{0i} | T_i = 0, \text{p}(\text{Ci}))\} | T_i = 1\}$ … (4)

Where

Y_{1i}; The potential outcome if the household is treated and

Y_{0i}; The potential outcome if the household is not treated.

However, calculating the effect through ATT is not immediately obvious since the propensity score is a continuous variable. To overcome this problem, the literature proposes four different methods: (a) Nearest neighbor (NN) matching, (b) Kernel matching, (c) Stratification matching, and (d) Radius matching (RM) (Becker and Ichino, 2002).

3.3.2 Nearest Neighbor (NN) Matching

The most straightforward matching method is the NN method where, initially, each treated unit is matched with the controlled unit that has the closest propensity score. The method is usually applied with replacements in the control units. In the second step, the difference in each pair of matched units is computed, and finally the ATT is obtained as the average of all these differences. Let U be the set of treated units and G the set of control units; Y_i^u and Y_j^g are the observed outcomes of the treated and control units, respectively. If $Q_{(i)}$ is a set of treated units matched to the control treated unit i with an estimated PSM value of P_i then:

$Q_{(i)} = \min j \parallel P_i - P_j \parallel \ldots\ldots\ldots\ldots\ldots$ (5)

3.3.3 Radius Matching (RM)

The NN method may face the risk of bad matches if the closest neighbor is far away. This can be avoided by imposing a tolerance level on the maximum propensity score distance (radius). The RM method is one form of imposing a common support condition where bad matches can be avoided. The determination of the radius should be careful since a very small radius can discard treated observations, but the quality of the matches is better.

$Q_{(i)} = \{P_j \mid \parallel P_i - P_j \mid < r\} \ldots\ldots$ (6) Now apply weights w_{ij}

$w_{ij} = \frac{1}{N_i^Q}$ if j$\in Q_{(i)}$ and w_{ij}=0 otherwise

ATT for both NN and RM is

$ATT^N = \frac{1}{N^T} \sum_{i\in T}[\, Y_i^T \sum_{j\in Q(i)} w_{ij}\, Y_j^Q] \ldots\ldots\ldots$ (7)

$ATT^N = \frac{1}{N^T} \sum_{i\in T}[\, Y_i^T - \sum_{i\in T} \sum_{j\in Q(i)} w_{ij}\, Y_j^Q]$

$= \frac{1}{N^T} \sum_{i\in T} Y_i^T - \frac{1}{N^T} \sum_{j\in Q} w_j\, Y_j^Q]$ where $w_j = \sum_i w_{ij}$

Variances can be estimated by assuming weights are fixed and outcome is independent across units.

Variance $ATT^N = \frac{1}{(N^T)^2} [\sum_{i\in T} var(Y_i^T) + \sum_{j\in Q} var\,(w_j)^2\ var(Y_j^Q)] \ldots\ldots\ldots$ (8)

$= \frac{1}{(N^T)^2}[N^T var(Y_i^T) + \sum_{j\in Q}(w_j)^2\, var(Y_j^Q)]$

$= \frac{1}{N^T}\ var(Y_i^T) + \frac{1}{(N^T)^2} \sum_{j\in Q}(w_j)^2\, var(Y_j^Q)$

3.3.4 Kernel Matching

In the kernel method, all the treated units are matched with the weighted average of all the non-treated units, using the weights that are inversely proportional to the distance between the propensity scores of treated and non- treated units. The ATT is calculated as:

$$ATT^K = \frac{1}{N^T} \sum_{i \in T} \{ Y_i^T - \frac{\sum_{j \in Q} Y_j^Q \, H(\frac{P_j - P_i}{V_n})}{\sum_{K \in Q} H(\frac{P_k - P_i}{V_n})} \} \ldots\ldots \ldots \ldots (9)$$

$$= \frac{\sum_{j \in Q} Y_j^Q \, H(\frac{P_j - P_i}{V_n})}{\sum_{K \in Q} H(\frac{P_k - P_i}{V_n})\}}$$

Where $H(.)$is a Kernel Function, and V_n is a Bandwidth Parameter.

3.3.5 Stratification Matching

The stratification matching method, consists of dividing the range of variation of the propensity score in a set of intervals (strata) such that, within each interval, the treated and non-treated units have the same propensity score on average. This method is also known as interval matching, blocking, and sub- classification. Hence, the g index defines the blocks over intervals of the propensity score; within each block,

$$ATT_g^S = \frac{\sum_{i \in I(g)} Y_i^T}{N_g^T} - \frac{\sum_{j \in I(g)} Y_j^Q}{N_g^Q} \ldots \ldots \ldots \ldots \ldots (10)$$

$I(g)$ is a set of units in block g while N_g^T and N_g^Q are the numbers of treated and control units in block g.

$$ATT^S = \sum_{g=1}^{Q} T_g^S \; \frac{\sum_{i \in I(g)} D_i}{\sum_{\forall_i} D_i}$$

3.4 Conclusion

Description of data and the methodological framework is defined in this chapter. HIES 2010-11 data has been used in this study which was conducted and compiled under the supervision of Pakistan Bureau of Statistics. All the four provinces of Pakistan including rural and urban regions are included in this study. This survey contains a precise and comprehensive information on the various social, demographic, economic and household factors including the information on food and non-food items, school enrollment and the provision of immunization and other health care facilities. Remittances variable has two outcomes that is received or not received so the impact

on household welfare is assessed by using a logistic regression model and along with this a variety of different individual, parental, household and regional variables have been integrated to evaluate the impact, whereas for data analysis STATA software has been used.

Chapter 4

Results: A Bi-Variate Analysis

4.1 Introduction

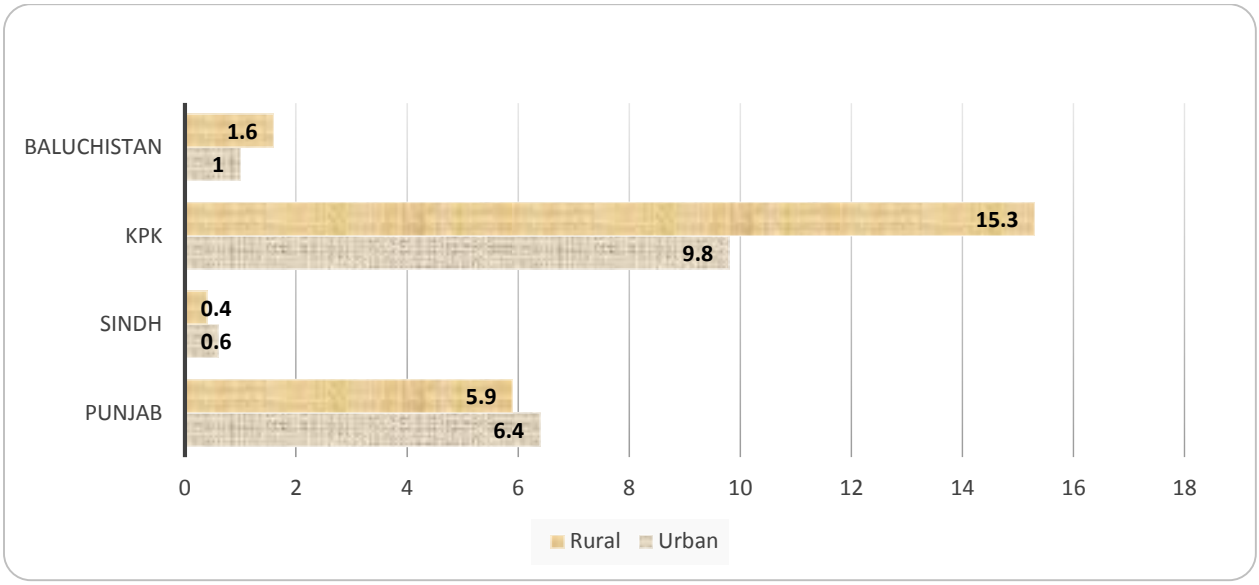
In this chapter various socio-demographic and economic characteristics have been associated with the remittances and it has described the bi-variate results of the impact created on household welfare by the receipt of remittances, in which the. Socioeconomic, demographic, regional, household and individual characteristics have been explored and the welfare impact is seen on the phenomena of poverty, child schooling under the following three indicators i.e. current enrollment, maximum education received and type of schools admitted, than this impact is also seen for the status of the married women in the household by the indictors such as immunization provided and the place delivery facility i.e. whether the delivery took place at home, Govt. hospital, private hospital or under the supervision of some trained person like Dai, LHW, LHV etc. The chapter includes the bi-variate analysis, that includes the cross tabulation of all key variables that have directly or indirect relationship with the receipt of remittances.

A sole comparison of all the important variables, that are necessary indicators for household welfare and are being affected by the incidence of receiving remittances, is given in this chapter. For all the households that are included in this data, a collective analysis is done at the regional and provincial level and along with it a household level analysis is also incorporated. For all the variables graphical representation is also explained and relationship between remittances and those variables is also drawn along with the logical support provided by the previous studies and theoretical annexation. The key variables that are drawn into this analysis as the determinants of remittances are age, age squared, gender of the household head, dependency ratio, education level of the head along with the regional characteristics. As it is obvious that the welfare of the household is a multidimensional phenomenon so we are using the selective indicators of the household welfare. This study will conform the fact that the remittances have a poverty reducing action along with the positive impact on the child schooling and health care provided to the married women.

Before going the bivariate analysis, the explanation of the receipt of remittances at the regional level is important to explain, so that the magnitude is seen for the provinces and the

regions. Most of the receivers in KPK reside in the rural areas and in Punjab around 6 percent are from rural areas as conformed by the statistics drawn from the HIES 2010-11 in Figure 3. The reason may be is that the majority of population is living in the rural areas and due to high unemployment there as compared to the urban areas, the immigration rate is slightly higher in the rural areas and so do the percentage of the remittance receivers.

Figure 3: Remittance Receiving Status across Regions (%)

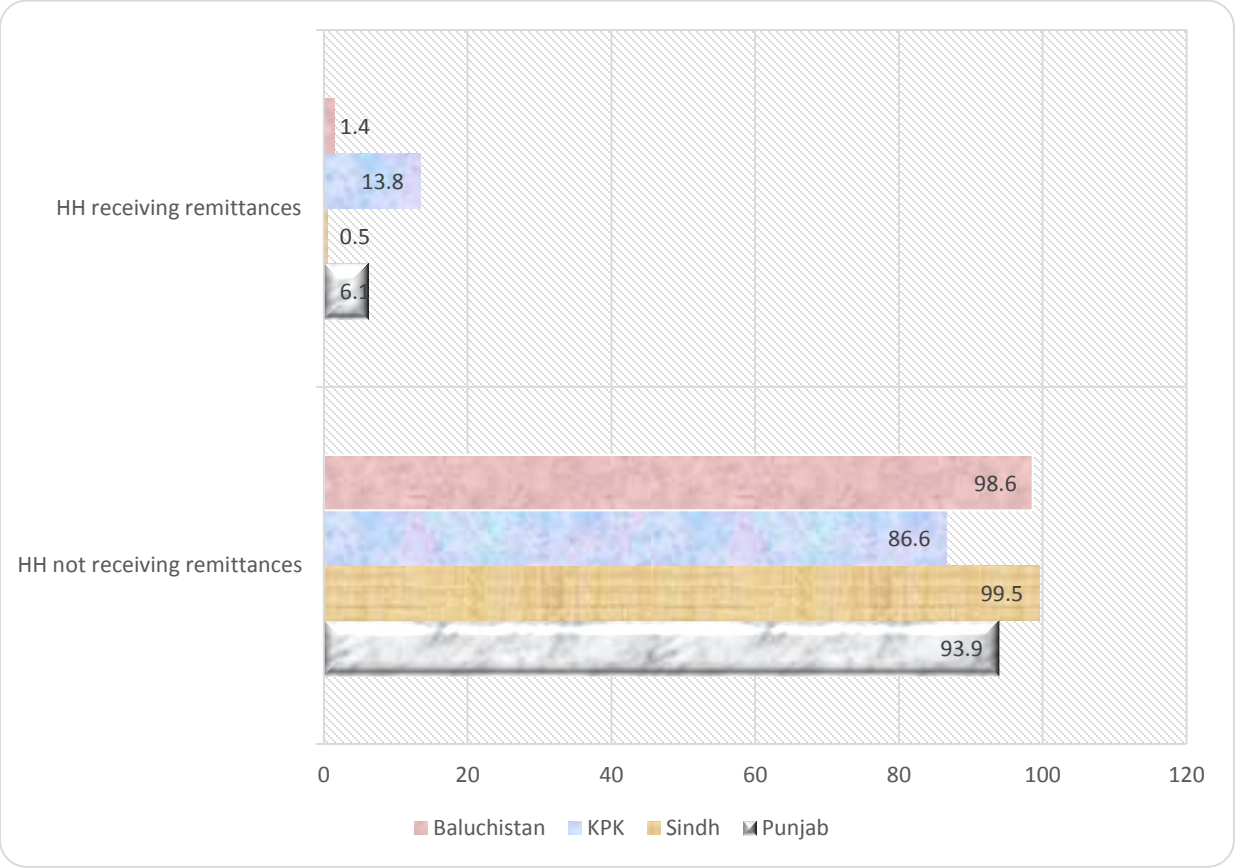


Source: Author's estimates based on HIES 2010-11 dataset

Starting with the fact that the majority of the remittance receivers are in KPK and Punjab as shown in figure 4. The receipt of remittances is very much lower in Sindh with a just about 0.5 percent, than the other province with lower remittance receipt is Baluchistan 1.4 percent. Situation is relatively better in Punjab as compared to these provinces where about 6.1 percent of the people receive remittances. But the most value of the remittances comes to KPK with 13.4 percent.

Now if we see at the rural and urban level than it would become obvious that in Punjab and Sindh most of the remittances are received by the urban region that is (6.37%) and (0.55%) respectively. whereas in KPK and Baluchistan the majority of remittance receivers resides in the rural areas, that is (15.32%) and (1.64%) respectively.

Figure 4: Remittances across Provinces (%)



Source: Author's estimates based on HIES 2010-11 dataset

Rest of the chapter 4 is organized as follows, Section 4.2 involves the analysis of the determinants of remittances, Section 4.3 shows the impact of remittances on various welfare indicators and Section 4.4 gives the summary of this chapter.

4.2 The Determinants of Remittances

This section of the chapter deals with the determinants of remittances. There are two kinds of determinants of remittances, one are the individual characteristics and the other are household characteristics. The individual determinants are age of household head, gender of household head and education level of household head. While the household characteristics include the household size and dependency ratio, while the regional and provincial characteristics will be incorporated within each set of determinants, individual or household.

4.2.1 Individual Characteristics of Household Head

From table 5 it can be seen that the households with the heads which are women are more likely to receive remittances than the households with male heads. If the age category is seen than it is evident that with the last age category both the male and women heads tend to receive more remittances, most likely because of high dependency. Other than this within all the age categories the women household heads receive more remittances as compared to the male household heads. The reason could be that the male tend to migrate while the women are left home with the family as the household head. So the migrants (males mostly) send remittances and the women household heads receive remittances and put up major share among the remittance receivers.

Table 5: Percentage of Receiving Remittances by Age and Gender of Household Head (%)

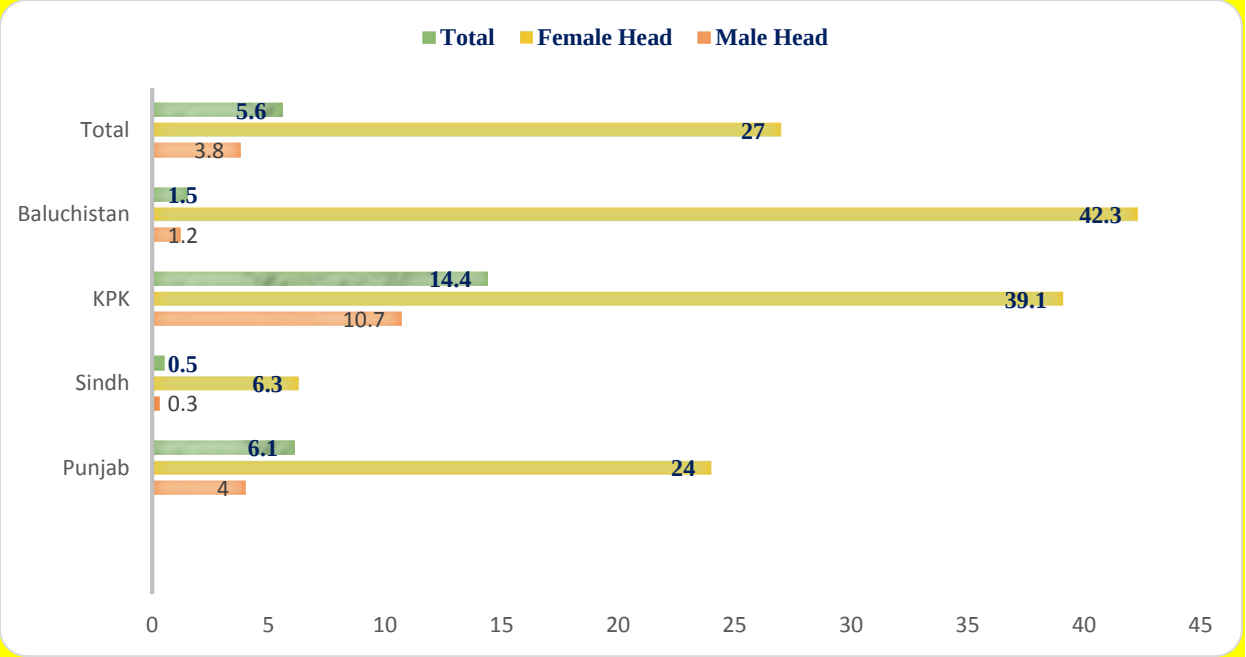
Age Category	Remittances Received by Gender of Head		Overall
	Male	Women	
Years (14 to 25)	3.5	33.0	6.1
Years (26 to 40)	1.6	37.0	4.2
Years (41 to 50)	2	31.0	4.3
Years (51 to 60)	5.5	15.0	6.1
Years (61 to 70)	10.4	12.0	10.4

Source: Author's estimates from HIES 2010-11 dataset

Now Figure 5 presents an obvious depiction that if a regional and provincial divide is put up among the remittance receivers, that is, whether the urban males/women household heads receive more remittances or the rural ones. Among the total population living in the rural/urban regions of the four provinces about 5.6 percent of them receives remittances, whereas most of the remittance receivers are in Punjab and KPK. And if the gender is taken into account than overall women household head receives a major portion of remittances that is about 27 percent and males receive around 4 percent of the remittances inflows. Now these statistics are seen among the provinces than in all the provinces women heads receive remittances more than the male household heads.

It can be seen in Table 6 that though Baluchistan receives only 1.5 percent of remittances but the percentage of the women household heads is the most highest in Baluchistan, no matter rural or urban. Another fact is that most of the remittances come in the rural areas, 6 percent as compared to 4.9 percent in the urban areas, and among all the provinces women headed households are likely to receive major percentage of remittances.

Figure 5: Remittance Receiving Status by Gender of HH Head across Provinces (%)



Source: Author's estimates from HIES 2010-11 dataset

Table 6: Receiving Remittances by Gender of Head at the Regional Level (%)

	Male Head	Women Head	Total
Urban Area			
Punjab	3.7	30.6	6.4
Sindh	0.5	2.5	0.5
KPK	7.3	36.0	10.4
Baluchistan	1.2	18.2	1.4
Total	3.0	28	4.9
Rural Area			
Punjab	4.2	20.0	5.9
Sindh	0.2	13.0	0.4
KPK	12.7	40.4	16.5
Baluchistan	1.1	60.0	1.5
Total	4.2	27.7	6.0

Source: Author's estimates from HIES 2010-11 dataset

Results from the Table 7 show that the low educated household head are found more often in the remittance receiving households. While household heads with secondary, college or higher levels of education are found in the non-remittance receiving households. The reason is that since the education levels are a signal for labour income levels, these results suggest that these remittance receiving households have low income levels because of low years of education completed by the household head.

Table 7: Receiving Remittances Status by Education/Gender of HH Head and Region (%)

	Male Head	Women Head	Overall
Overall			
Illiterate	3.5	24.4	6.0
1-5	3.2	36.6	5.2
6-8	4.6	38.1	6.2
9-10	5.0	33.3	6.1
11 and above	3.1	31.4	4.0
Total	3.8	27.9	5.6
Urban Area			
Illiterate	2.3	20.2	4.5
1-5	3.1	42.2	6.3
6-8	2.4	35.6	4.5
9-10	4.1	36.3	5.4
11 and above	3.4	33.3	4.2
Total	3.1	28.0	4.8
Rural Area			
Illiterate	4.0	26.2	6.5
1-5	3.3	31.7	4.6
6-8	6.2	41.3	7.4
9-10	6.1	29.4	6.8
11 and above	2.6	28.1	3.3
Total	4.2	27.8	6.0

Source: Author's Estimates from HIES 2010-11 dataset

The remittance education relationship is more powerful for the male household heads because mostly in our Pakistani culture male heads are the bread earners and their education levels represent the household income level through the labour income of the head. It can be seen from the table 7 that as soon as the education levels touch the secondary schooling years the receipt of remittances drops drastically i.e. around 3 percent for either the urban males or rural males or for overall of the sample.

The table 7 above conveys the message that as the education years of the household head are increasing the likelihoods of securing any employment opportunity at home are increasing. So the trend of migration abroad and remitting back home is decreasing with the increasing years of schooling and most likely the secondary education. Though the relationship between education of household head and women gender is also depicting the same picture but the magnitude is not stronger, because women household heads are mostly in our population not involved in the labour as they have the job of looking after the family whereas males are the bread earners. Seen from another angle if the head of the household is illiterate or has completed only a few years of schooling than the odds of migration of the head himself/herself or spouse or blood relative who

was the head earlier are more because of the decreasing employment opportunities in Pakistan especially for the illiterate and those with a few years of schooling.

4.2.2 Household Characteristics

In this part a few characteristics of the households like dependency ratio and household size will be discussed and estimated by the notion that whether the household receives remittances or not.

In Table 8 next page, first of all if the dependency ratio is seen with respect to the remittance receiving status and with the regional/provincial breakdown. If the overall relation between the remittance receiving status and dependency ratio is seen than it is somehow not clearly positive or negative. Though, theoretically the relationship between remittances and dependency ratio is seen as positive i.e. with the increase in dependency ratio the migration increases and so does the remittance receiving. This is because there is a higher need for remittances in countries with a high ratio of dependents to the working age population. However it is often seen that the countries with high dependency ratio have low remittance inflows. If the relationship between remittances and dependency ratio is negative than it could be because of the reason that due to the increase in the dependency ratio the potential migrant is unable to migrate, thus a negative impact on migration and thus indirectly a negative impact on remittances (De Haas, 2007).

The higher the share of dependents, the fewer people are in the age group in which people typically migrate. Also, the more dependents a population has, the more difficult does it become for those who could potentially migrate to leave their country. Alternatively, a high age dependency ratio might indicate that the country is more developed and hence, the need for remittances is smaller. If we see province wise than the overall the relationship between remittances and dependency ratio is negative for Punjab, Sindh and Baluchistan, but a bit positive for KPK. The above reasons are clearly explaining this relation. In urban areas the relationship between dependency ratio and remittances is negative but it is positive for the rural areas.

Table 8: Receiving Remittances by Dependency Ratio and Regional Breakdown (%)

	Low	Medium	High	Overall
Overall				
Punjab	44.2	23.4	32.4	100
Sindh	50.0	25.0	25.0	100
KPK	31.1	27.3	41.5	100
Baluchistan	30.3	42.4	27.3	100
Total	38.0	26.0	36.0	100
Urban Area				
Punjab	49.7	23.0	27.3	100
Sindh	60.0	20.0	20.0	100
KPK	42.2	26.5	31.4	100
Baluchistan	12.5	50.0	37.5	100
Total	46.6	24.8	28.6	100
Rural Area				
Punjab	39.8	23.7	36.5	100
Sindh	40.0	30.0	30.0	100
KPK	27.3	27.7	45.0	100
Baluchistan	36.0	40.0	24.0	100
Total	33.2	26.6	40.2	100

Source: Author's estimates from HIES 2010-11 dataset

As can be seen from Table 9 that follows, if the household size and remittance receiving status is analyzed than the relationship is obvious that with an increase in the household size the incidence of receiving remittance decreases. Probably also because of the reason that the higher the family size, the fewer people are in the age group in which people typically migrate, so by decreasing the potential migration, thus remittances display a negative impact on the receipt of remittances. If the overall relationship at the provincial level is seen than it is clear from the table 9 below that with the increase in family/household size the receipt of remittances is decreasing, for the household size of up to 4 members the percentage of receiving remittances is 24 percent, for 5-7 members it is 39 percent, than for 8-9 members it is 16 percent and for 10 and above family members the percentage of remittance receiving households is only 13 percent. This effect can be seen for all the provinces i.e. Punjab, Sindh, KPK and Baluchistan.

The most drastic negative effect on remittances is caused when the household size is 10 members or above which puts a big cut on remittance proceeds. If this relationship is seen at the regional level than the incidence of a negative relation between household size and remittances is also same, both for the urban and the rural region. For urban region the overall relation is as follows up to 4 (30 percent), 5-7 members (38 percent), 8-9 members (15 percent), and for 10 and above members (16 percent). Now if the rural area is analyzed than the relationship (negative) is also

same as seen overall, at provincial or at urban level. For rural region the overall relationship between household size and remittance flows is as follows; up to 4 (21 percent), 5-7 members (40 percent), 8-9 members (16 percent), and for 10 and above members (23percent).

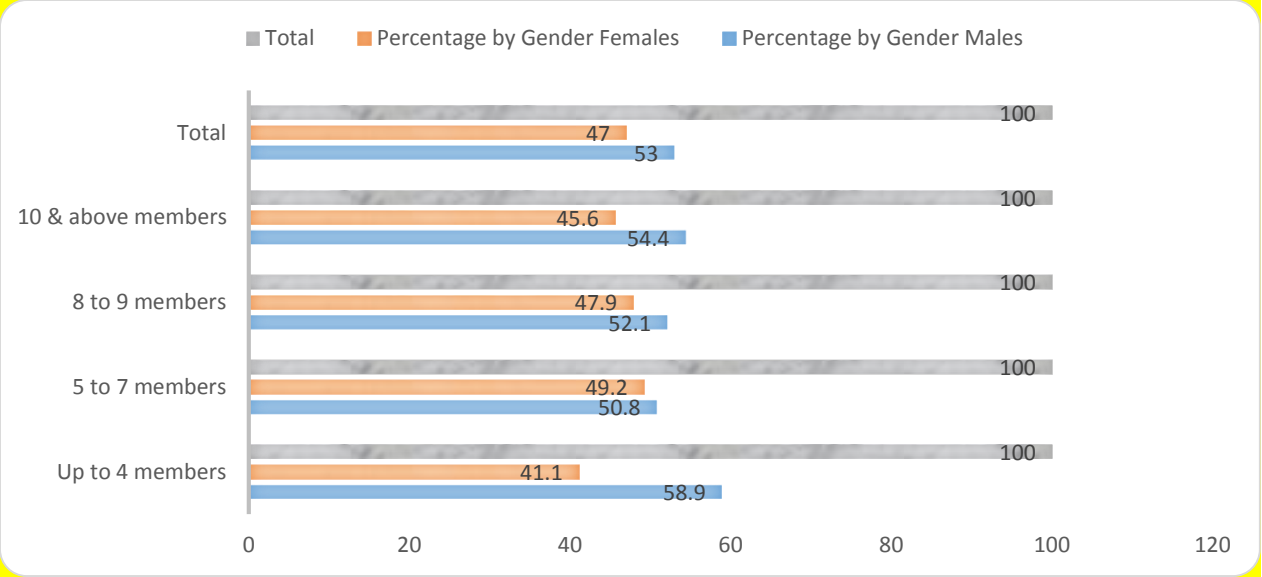
Now to see the gender breakdown at the household size level, for the remittances receiving household it can be seen from Figure 6 below that the for the remittance receiving household with size Up to 4 members the percentage of males in the household size is 58.9 percent and that of womens is 41.1 percent. With the increase in the household size of the remittance receiving households, there is a decrease in the percentage of males that can be seen from the figure 6 that if the household size is at maximum (10 and above members) than the percentage of womens is increased to 45.6 percent while the percentage of males decreased to 54.4 percent. But overall still the percentage of males (53 percent) in the remittance receiving households is greater than the percentage of women (47 percent) in the remittance receiving household.

Table 9: Receiving Remittances by HH Size and Regional Breakdown (%)

	Up to 4 members	5-7 members	8-9 members	10 and above	Total
Overall					
Punjab	33.8	39.2	13.3	13.7	100
Sindh	15.0	30.0	35.0	20.0	100
KPK	15.4	38.2	18.5	27.85	100
Baluchistan	9.1	57.5	6.1	27.3	100
Total	24.1	39.3	15.8	20.8	100
Urban					
Punjab	38.0	37.0	13.4	11.6	100
Sindh	30.0	20.0	40.0	10.0	100
KPK	17.7	41.2	17.6	23.5	100
Baluchistan	12.5	37.5	0.00	50.0	100
Total	30.3	37.8	15.3	16.6	100
Rural					
Punjab	30.5	41.1	13.1	15.3	100
Sindh	0.0	40.0	30.0	30.0	100
KPK	14.7	37.2	18.8	29.3	100
Baluchistan	8.0	64.0	8.0	20.0	100
Total	20.7	40.1	16.1	23.1	100

Source: Authors estimates from HIES 2010-11 data

Figure 6: Remittances and Household Size by Gender Division (%)



Source: Author's estimates from HIES 2010-11 Data

4.3 Impact of Remittances on Household Welfare

Household welfare in this study is defined by three main variables, poverty (head count), child schooling (age 5-15 years) and health status of reproductive married women (age 15-49 years). For child schooling variable there are three other welfare indicators for it i.e. current school enrollment, highest level of education achieved and type of institution in which the child got admitted. For the health status of reproductive married women there are also other three indicators i.e. prenatal care and immunization received during last pregnancy and the place of child birth.

4.3.1 Impact of Remittances on Poverty

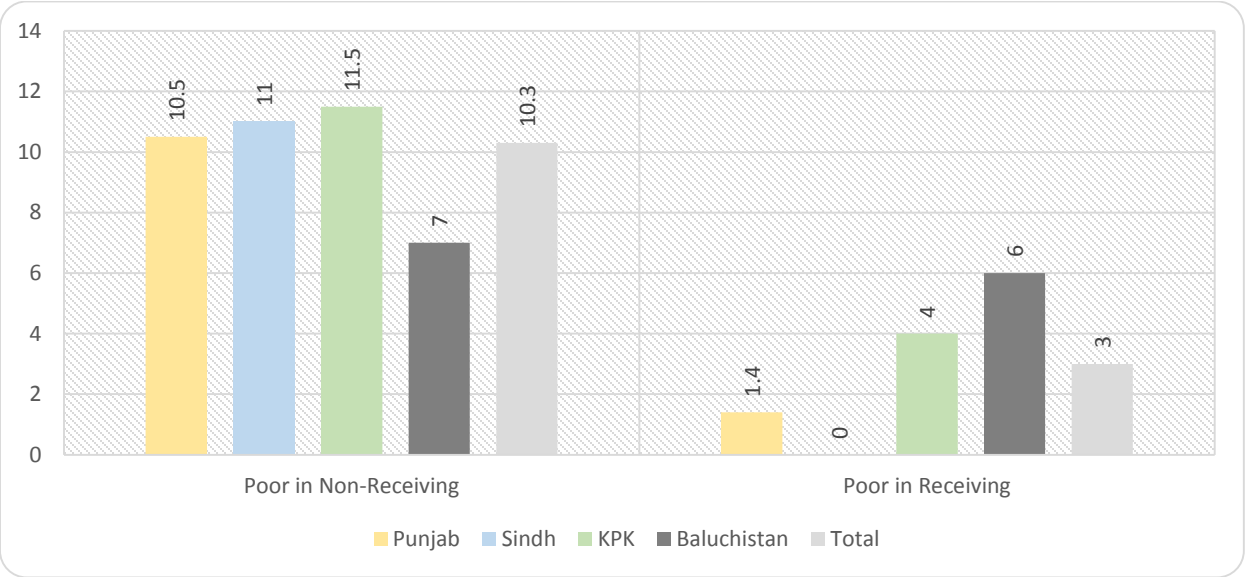
Before estimating the impact of remittances on poverty it is worthy to mention some poverty levels for Pakistan. According to the calories based poverty line[7] the national population that falls below the poverty line is 12.1 percent. While poverty at the urban region level is 7.1 percent and at the rural region level it is 15.1 percent.

The figure 7 above tells that overall at the national level among the remittance receivers the non-poor who remittances are 97 percent, while those who are poor are 3 percent. In Sindh none of the remittance receivers is poor. So the most significant impact of remittances on poverty is in Sindh. , In Punjab 98.6 percent are non-poor remit receivers and while the percentage of poor

[7] Estimated by Planning Commission of Pakistan

remit receivers is 1.4 percent. In Baluchistan and KPK 6 percent and 4 percent remit receivers are poor, respectively.

Figure 7: Poverty and Remittances Status across Provinces (%)



Source: Author's estimates from HIES 2010-11 Data

In Table 10 for the poverty estimates of the remittance receiving households in the urban region, among the remittances receivers only 1.6 percent are poor in the urban region. Again none of the remittance receivers is poor in Sindh and also in Baluchistan, while about 0.5 percent of the remittance receivers are poor in Punjab but the percentage of the remittance receiving but still poor households is about 4 percent.

For the impact of remittances on poverty in rural households the situation is worse than the urban households amongst all the four provinces. At the overall rural level 3.4 percent of the remittance receivers are still poor. In Sindh still situation none of the remittance receiving household is poor. But in rural Baluchistan, rural Sindh and in rural Punjab the percentage of the remittance receiving poor households is 8 percent, 4.1 percent and 2.2 percent respectively.

Table 10: Impact of Remittances on Poverty Status of Remittance Receiving Household at Regional Level (%)

Province	Poor in Non-Receiving	Poor in Receiving
Urban		
Punjab	5.5	0.5
Sindh	5.0	0.0
KPK	9.5	3.9
Baluchistan	5.1	0.0
Total	5.9	1.6
Rural		
Punjab	14.1	2.2
Sindh	15.7	0.0
KPK	12.6	4.1
Baluchistan	8.1	8.0
Total	13.3	3.4

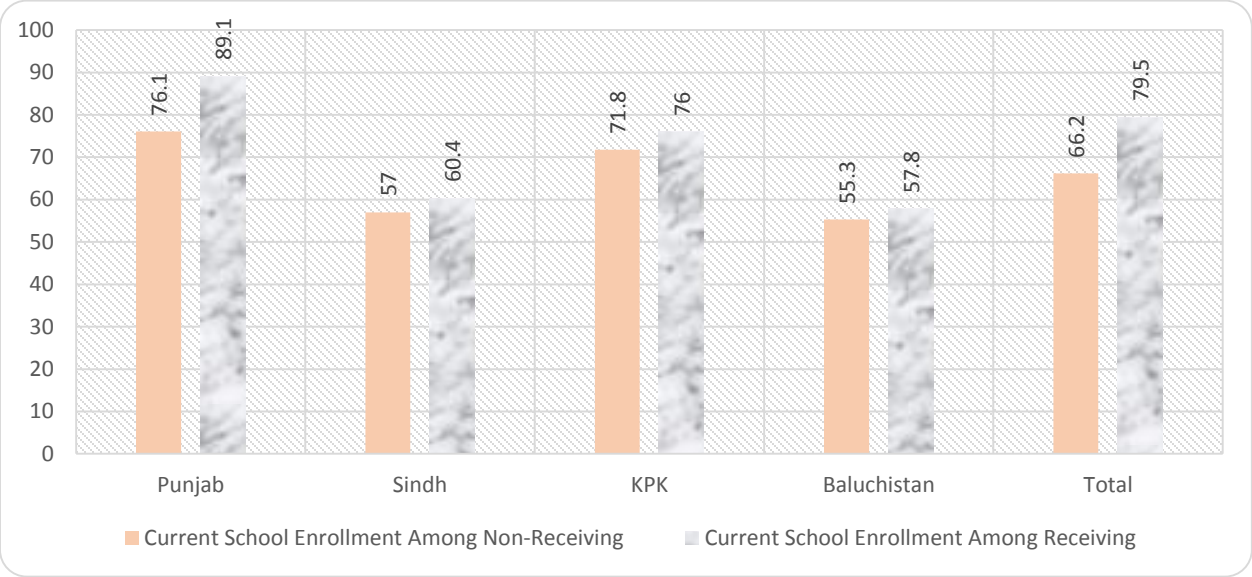
Source: Author's estimates from HIES 2010-11 data

4.3.2 Impact of Remittances on Child Schooling

To see the impact of remittances on child schooling there are three indicators used in this study i.e. current school enrollment, highest level of education received for the children of remittance receiving households.

Firstly as presented in the Figure 8 below, consider the impact of remittances on the current school enrollment of the children from the remittance receiving households. If the overall impact of remittances is seen for the current school enrollment of the children at the overall provincial level than it can be seen that there is a high percentage of current enrollment of the children (79.5 percent). And only 21 percent of the children are not enrolled for such households. The positive impact is significant for all the provinces.

Figure 8: Remittances and Current School Enrollment Status across Provinces (%)



Source: Author's estimates from HIES 2010-11 data

In Table 11 if seen in the urban region than the positive impact is much stronger i.e. current school enrolment increased up to 88 percent, whereas for the rural region the effect is also significant by 76 percent. The magnitude of the positive impact of remittances is also quite significant for the rural urban regions at the provincial level, with Punjab and KPK mostly increased the current school enrollment due to receipt of remittances. For Punjab (Rural=86 percent, Urban=94 percent) and KPK (Rural=74 percent, Urban=82 percent).

Table 11: Impact of Remittances on Current School Enrollment of Children in Remittance Receiving Households at Regional Level (%)

Province	Current School Enrollment	
	Among Non-Receiving	Among Receiving
Urban		
Punjab	84.6	94.0
Sindh	70.9	58.0
KPK	81.5	82.7
Baluchistan	71.0	81.8
Total	77.8	87.5
Rural		
Punjab	70.8	85.9
Sindh	48.9	62.0
KPK	67.1	74.1
Baluchistan	46.9	50.0
Total	59.6	76.2

Source: Author's estimates from HIES 2010-11 data

Now the last indicator used in this study to evaluate the impact of remittances on the child schooling is the type of institution in which the child is admitted for the remittance getting households in Table 12, whether the school/institution is private or Govt. school. Though overall the effect at the provincial level is that the remittance receiving households still admit their children in the govt. schools. But in Punjab at the overall level the trend for the remittance receiving household is to admit their child in the private school while seeking the education quality.

Table 12: Type of Institution for the Children of Remittance Receiving Households at the Regional and Provincial Level (%)

Province	Non-Remittance Receiving		Total	Remittance Receiving		Total
	Government School	Private School		Government School	Private School	
Overall						
Punjab	61.3	38.7	100	43.3	56.7	100
Sindh	73.4	26.6	100	55.2	44.8	100
KPK	72.8	27.2	100	62.2	37.8	100
Baluchistan	93.7	6.3	100	96.2	3.8	100
Total	71.6	28.4	100	55.6	44.4	100
Urban						
Punjab	47.5	52.5	100	27.7	72.3	100
Sindh	53.7	46.3	100	63.6	36.4	100
KPK	57.0	43.0	100	41.8	58.2	100
Baluchistan	89.5	10.4	100	89.0	11.0	100
Total	57.8	42.2	100	36.5	63.5	100
Rural						
Punjab	71.5	28.5	100	54.7	45.3	100
Sindh	90.35	9.7	100	50.0	50.0	100
KPK	82.3	17.7	100	68.4	31.6	100
Baluchistan	97.2	2.8	100	100.0	0.0	100
Total	82.0	18.0	100	64.4	35.6	100

Source: Author's estimates from HIES 2010-11 data

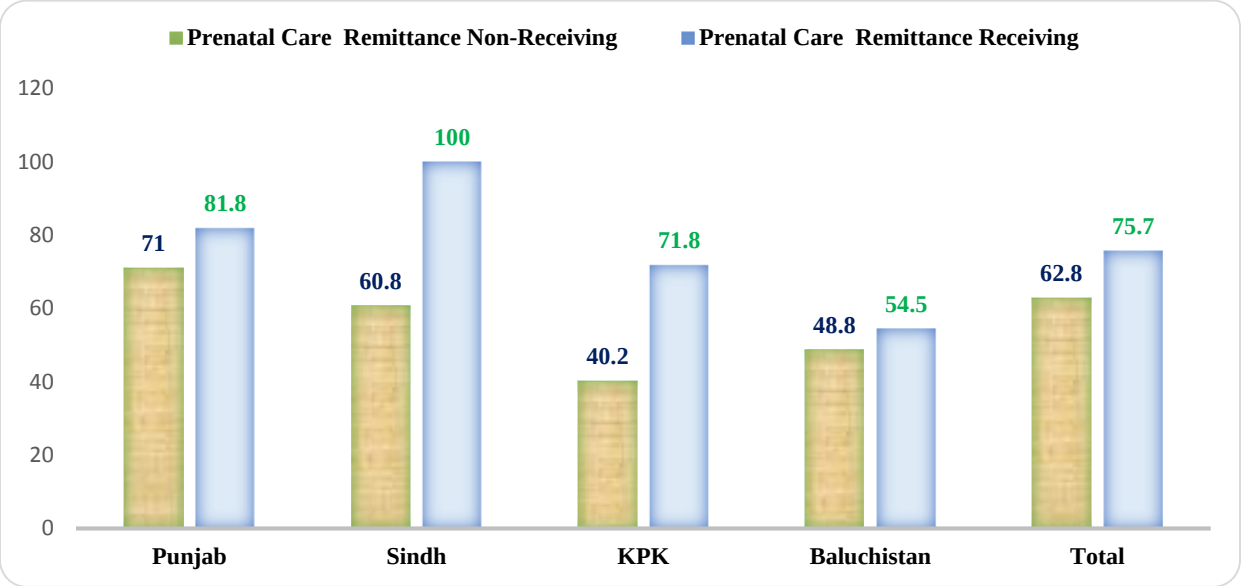
The overall effect at the urban region for the remittance receiving household is to admit their child in private school i.e. 65 percent, while the major contribution in this effect is again from Punjab (75 percent) and KPK (58 percent). While in the rural region the trend is to admit the child in the govt. school for the remittance receiving households, the possible reason could be the non-availability of the private schools in the rural areas.

4.3.3 Impact of Remittances on the Health Status of the Reproductive Married Women

The last variable used in this study to analyze the effect of remittances on household welfare in Pakistan is the impact of remittances on the health status of the reproductive married women (15-49 years of age). To analyze this variable there are three indicators that are used in this study, which are prenatal care, immunization received during last pregnancy and the place of Child birth.

In Figure 9 below the health status of the reproductive married women from the remittance receiving households is given i.e. what is the impact of remittances receipt on the prenatal care.

Figure 9: Remittances and Prenatal Care Status among Reproductive Married Women across Provinces (%)



Source Authors estimates from HIES 2010-11 data

From the Figure 9 above it can be seen that at the overall provincial level the receipt of remittances increases the percentage of pregnant women to receive prenatal care. The receipt of remittances increases the percentage of the reproductive married women by 75.7 percent for receiving prenatal care and only 24.3 percent from such households did not receive such care. Among all the provinces, the women who belong to the remittance receiving households have a greater percentage for receiving prenatal care, as seen from the figure 9.

For the regional level statistics it can be seen from the table 13 that among all the provinces the positive effect of remittances on prenatal care is stronger, increasing the percentage of reproductive married women who receive prenatal care. Among all the provinces the receipt of remittances increases the percentage of prenatal care receiving reproductive married women significantly, whether at the provincial level or at the regional level.

At the urban region level the average percentage for receiving prenatal care is 81 percent for those married reproductive women which belong to the remittance receiving household. And whereas the percentage of prenatal care receiving reproductive married women in rural areas is around 74 percent. The reason may be the increased household income.

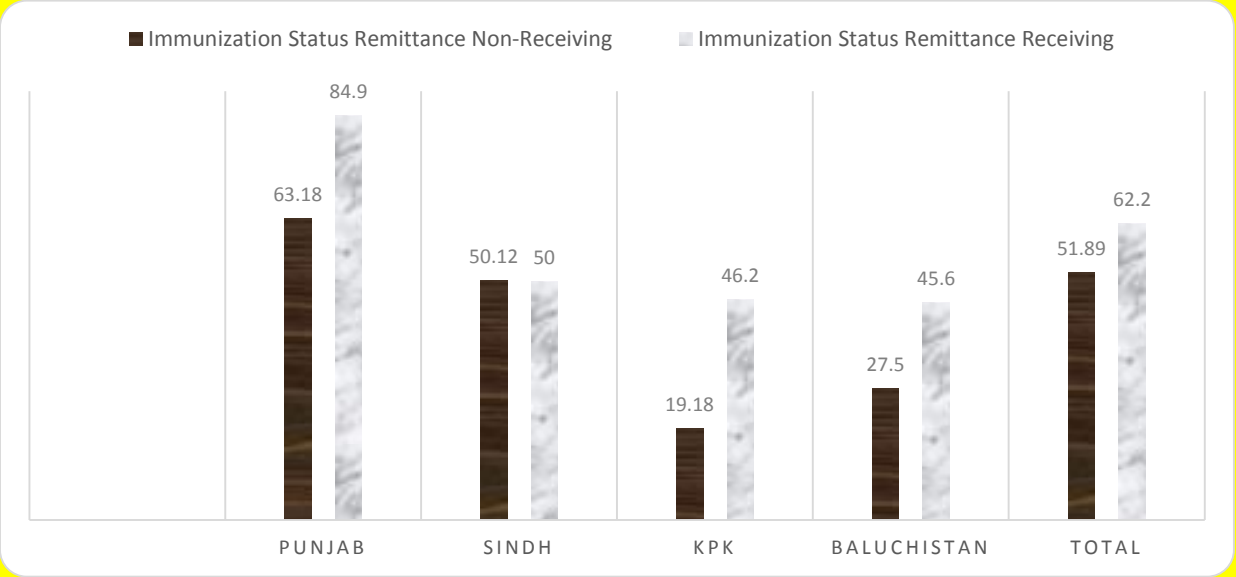
Table 13: Impact of Remittances on Prenatal Care of the Reproductive Married Women at the Regional Level (%)

Province	Prenatal Care	
	Remittance Non-Receiving	Remittance Receiving
Urban		
Punjab	63.18	81.8
Sindh	57.86	100.0
KPK	47.90	80.0
Baluchistan	44.8	100.0
Total	60.37	81.0
Rural		
Punjab	76.86	81.8
Sindh	63.0	100.0
KPK	39.23	69.0
Baluchistan	37.6	62.5
Total	64.27	73.6

Source: Authors estimates from HIES 2010-11 data

Another indicator for the health status of the reproductive married women as shown in Figure 10 below, is the immunization status i.e. whether these women received immunization or not while their household is receiving remittances. For this indicator the impact of remittances is also positive and increasing. At the overall provincial level the receiving of remittances increases the percentage of reproductive married women getting immunized by 62 percent, while the impact is highly significant in magnitude and direction for the province of Punjab with the percentage of women receiving immunization due to the receipt of remittances by 85 percent. Remittances have a significant and stronger effect on the immunization status of the reproductive married women in Punjab, KPK and Baluchistan. While in Sindh the immunization status percentage is almost same for both the remittance receivers and non-receivers.

Figure 10: Remittances and Immunization Status among Reproductive Married Women at the Provincial Level (%)



Source: Authors estimates from HIES 2010-11 data

If seen in Table 14, for both the urban and rural regions, the effect of remittances on the immunization of the reproductive married women is also positively overall. Among the provinces, in the urban regions of Punjab and Sindh the receiving of remittances increases the percentage of immunized reproductive women by 72 percent and 50 percent, while the percentage of women from KPK and Baluchistan who are receiving immunization and belong to the remittance receiving households increases by 30 percent and 67 percent respectively.

While in the rural areas among the provinces Punjab and KPK the receipt of remittances increases the percentage of reproductive women receiving immunization by 91 percent and 51 percent, while the remittances increase the percentage of the immunization of the reproductive married women in the rural areas of Sindh and Baluchistan by 50 percent and 37 percent. But overall the effect is also positive in the rural region among all provinces, the receipt of remittances increases the percentage of immunized women by 66 percent in the rural areas.

Table 14: Impact of Remittances on the Immunization Status of the Reproductive Married Women at the Regional level (%)

Province	Immunization Status	
	Remittance Non-Receiving	Remittance Receiving
Urban		
Punjab	54.0	72.7
Sindh	53.4	50.0
KPK	16.0	30.0
Baluchistan	35.5	66.6
Total	51.9	52.4
Rural		
Punjab	69.8	90.9
Sindh	47.5	50.0
KPK	19.6	51.7
Baluchistan	23.5	37.5
Total	51.8	66.0

Source: Authors estimates from HIES 2010-11 data

The last indicator for analyzing the impact of remittances on the health status of reproductive married women variable of the household welfare in this study is the place of child birth in table 15. In this table it is checked that whether the receipt of remittances has a positive impact on this variable, that is, whether the reproductive married women is provided with the child delivery facility in the hospital or the child is born in home.

It can be seen from the Table 15 that the receipt of remittances increases the percentage of reproductive married women receiving the child delivery facility in the hospital in the rural and urban regions. If seen at the overall provincial level, the receiving of remittances increases the percentage of women going to hospital for child delivery in Sindh, KPK and Baluchistan by 83 percent, 73 percent and 36 percent respectively, while in Punjab the percentage is 47 percent.

If seen at the urban region level than the portrait is a bit different, overall increase in percentage of child deliveries in hospitals increases by 52 percent, in the Punjab urban it is 51 percent, for Sindh urban it is 50 percent, for KPK urban it is 62 percent and Baluchistan urban the percentage is 66 percent. For the rural region the percentage increase in hospital child deliveries is

overall 62 percent. While the increase in Punjab rural is 44 percent, Sindh rural is 60 percent and KPK rural is around 75 percent. While in Baluchistan rural there is no significant impact of remittances on the child delivery at hospital as it is 25 percent only, probably because of the culture of delivery at home and also the lack of medical facilities.

Table 15: Impact of Remittances on the Place of Child Birth at the Regional Level (%)

Province	Remittance Non-Receiving			Remittance Receiving		
	Hospital	Home	Total	Hospital	Home	Total
Overall						
Punjab	54.0	46.0	100	47.3	52.7	100
Sindh	57.2	42.8	100	83.3	16.7	100
KPK	68.9	31.1	100	73.8	26.2	100
Baluchistan	65.2	34.8	100	36.4	63.6	100
Total	57.4	42.6	100	60.0	40.0	100
Urban						
Punjab	57.3	42.7	100	51.2	48.8	100
Sindh	62.6	37.4	100	50.0	50.0	100
KPK	56.3	43.7	100	62.5	37.5	100
Baluchistan	29.7	70.3	100	66.7	33.3	100
Total	59.3	40.7	100	52.1	47.9	100
Rural						
Punjab	51.7	48.3	100	44.4	55.6	100
Sindh	52.9	47.1	100	60.0	40.0	100
KPK	70.6	29.4	100	74.4	25.6	100
Baluchistan	37.4	62.6	100	25.0	75.0	100
Total	56.3	43.7	100	62.5	37.5	100

Source: Author's estimates from HIES 2010-11 data

4.4 Conclusion

This chapter analyzed, using the bivariate analysis, firstly the determinants of remittances at the household and at the individual level and then estimated the impact of remittances on the household welfare. Target group of this study is the households which lie in the rural and urban areas of Punjab, Sindh, KPK and Baluchistan. Household integrated economic survey (HIES) 2010-11 conducted under the supervision of Pakistan Bureau of Statistics was used. Comprehensive sections on various socio-economic, demographic, and the economic factors including the information on household roster, educational status, health, employment, wealth, income and expenditure are available in this data.

Results of this chapter showed the majority of remittance receivers reside in the rural areas at the national level and it is also concluded that the province with the major share in the remittances received is KPK. Another finding of this chapter is that the majority of household head that receive remittances are women and that remittances have a significant negative relationship with the education of household head, i.e. if the educational years increase than the percentage of remittance receiving will decrease, meaning that the household head will find an employment opportunity in the home country. As well as with an increase in the age of household head the proportion of the remittance received is decreased. It is also suggested by the results that the households with the high dependency ratio have a significant share in the receipt of remittances as compared to the households with a medium and low dependency ratio.

Same findings can also be seen for the household size i.e. an increased household size needs an increased expenditure and is more dependent on the remittances as compared with the households with less members. There is a positive impact of remittances on the current school enrollment, type of institution in which the child admitted and a negative impact on the highest level of education received for the children of remittance receiving households. The results for poverty and remittance status also suggest a poverty alleviating impact of remittances for the poor people. The impact on health status also reveals that the impact of remittances on the prenatal care, immunization and child delivery place of the reproductive married women is positive.

Chapter 5

Results: A Multivariate Analysis

5.1 Introduction

To facilitate and endorse the findings of the bivariate analysis in the previous chapter 4, multivariate results are explained in this this current chapter. In this chapter the impact of remittances on the various indicators of household welfare like poverty, current school enrollment, highest level of education achieved, type of institution admitted for the child schooling, prenatal care, immunization and place of child birth for the of reproductive married women is estimated by using propensity score matching. Rest of the chapter is organized as follows; the determinants are analyzed in section 5.2, section 5.3 gives the analysis for the impact of remittances on poverty, section 5.4 explores the impact on the various indicators of child schooling, section 5.5 examines the impact of remittances on the health status of the reproductive married women and section 5.6 gives conclusion of this chapter.

5.2 The Determinants of Remittances

Like it was mentioned in the methodology chapter the dependent variable remittances has only two outcomes i.e. received or not received. Being only two outcomes, the logistic regression model has been applied in which various socio-demographic and economic variables have been used as the explanatory variables to observe their potential impacts on the recipient status of remittances which includes individual characteristics, household characteristics and regional characteristics. However the key focus of this study is to analyze the impact of remittances on poverty, current school enrollment, highest years of schooling attended, type of institution attended, immunization to married women, place of child birth and pre-natal care during pregnancy.

Estimation of propensity score is the first step in the empirical exercise, that is, the estimation of the propensity to be treated, where receiving remittances is the treatment. Therefore, 1 is assigned to the dependent variable if the international remittances are received by household and 0 otherwise. This specification uses following variables of the household head as explanatory variables: age linear, age squared, gender of the head (0 if women), education level. It also includes household size as explanatory variable, a rural dummy for the region and with the Punjab as the

reference province it includes Sindh, KPK and Baluchistan and the other interaction variables. The two conditions that are balancing and un-confoundedness must be met to calculate the ATT, whilst the propensity scores are estimated using logistic regression. Than from these propensity scores that are the results of the observable characteristics, ATT effect will be estimated for the households having the same observable characteristics by applying various PSM specifications i.e. Nearest neighbor matching, Radius matching, Kernel matching and stratification matching. The results of the determinants of remittances are presented in Table 16 by including the correlates for which both of the above mentioned conditions are satisfied.

Table 16: Determinants of Remittances: Logistic Regression

Covariate	Coefficients	Standard Error
Sex of head (male = 1)	-2.561*	0.092
Age of head (years)	-0.057*	0.014
Age square of head	0.0007*	0.0001
Education of head (illiterate as reference)		
Grade 1-5	0.481*	0.115
Grade 6-8	0.581*	0.129
Grade 9-10	0.645*	0.117
Grade 11 and above	0.542*	0.134
Household size	0.105*	0.010
Region (Urban=1)	-0.249*	0.082
Province (Punjab as reference)		
Sindh	-2.252*	0.232
KPK	0.792*	0.081
Baluchistan	-0.991*	0.188
Constant	-0.803**	0.369
LR chi2	1506.73 (12)	
Log likelihood	-2647.477	
Prob > chi2	0.0000	
Pseudo R2	0.2215	
N	16,341	

Source: Authors estimates from HIES 2010-11 [* significance at 1% & ** significance at 5%]

As shown in table 6, from the logistic regression the small p-value shows that at least one of the coefficients of regression is not equal to zero. The model is showing the significant Pseudo R square, although this term does not equate with the Pseudo R square in the OLS. All the explanatory variables are highly significant at 1 percent level. All the variables have the signs that were expected, for example the sex of household head coefficient is significant and is negative which means that amongst most of the households that receive remittances, the percentage of

women are more. Than age of the household head coefficient is giving the message that with the increase in the age of the household head the amount of remittances received decreases. And then the education of household head, using education (1-5 years) as a reference category, with categories (1-5), (6-8), (9-10), (11 and above) also has a positive and significant sign suggesting that with the increase in the education level of household the dependency on remittances decreases may be because of the reason that the household head may find employment at home. Then comes the household size with a significant positive coefficient depicting that with the increase in the household size the probability of remittances received increases. After that the region dummy is suggesting that most of the remittances come to the rural areas and provincial statistics confirm the fact that most of the remittances come to KPK and using Punjab as the reference category.

Now regarding different matching techniques, the choice of the estimator crucially depends on the situation at hand. The performance of different matching estimators varies case-by-case and depends largely on the data structure at hand. If there are only a few control observations, it makes no sense to match without replacement. On the other hand, if there are a lot of comparable untreated individuals it might be worth using more than one estimator for more precision in estimates. Now this brings us to the final stage of PSM analysis.

5.3 Impact of Remittances on Household Welfare

To estimate the impact of remittances on household welfare, three household sections are selected in this study; poverty, child schooling (5-15 years age) and health status of the reproductive married women (15-49 years age). Under the child schooling section, current school enrollment, highest level of education achieved and type of institution in which the child is admitted are taken. Whereas in the section of health status of reproductive married women indicators like prenatal care, immunization and place of child delivery are taken.

5.3.1 Impact of Remittances on Poverty

All aspects of consumption, including food and non-food items are included in detail in the consumption sections of HIES 2010-11 dataset and sufficient information is also given to calculate head-count poverty. Therefore making possible the evaluation of the relationship between remittances and household consumption expenditure and poverty. For a detailed analysis, this study splits per capita total expenditure into food and non- food expenditures, the methodology for constructing the poverty line is given in the methodology section.

In terms of ATT the estimated welfare impact of the remittances against the poverty indicator of the household welfare is given in the Table 17 below. In this table standard error (bootstrapped and analytical), t-values (bootstrapped and analytical), the number of matching cases treated and size of the control group is also given. The results show that the impact of remittances on the household poverty is very significant and negative for all the four measures of ATT, (Esquivel and Alejandra, 2007). Moreover, across all the alternative methods the results in this table are, in qualitative terms, quite consistent. The welfare effect on poverty ranges between 7.8 to 8.1 percentage points. That is for example a $ 1 receipt remittances decreases the incidence of poverty by 7.8 – 8.1 percent. From the qualitative perspective although these results are already conclusive and quite strong, but since the estimates fluctuate within an interval close to 0.1 percentage points, these results still are relatively imprecise.

Table 17: ATT Effect of Remittances on Poverty (Head-Count)

	NN method	Kernel method	Radius method	Stratification method
ATT	**-0.078***	**-0.078***	**-0.075***	**-0.081***
N. treated	871	871	673	871
N. control	1253	15421	6981	15423
St. error	0.013	0.0068	0.007	0.008
t-stat	-5.959	-11.353	-10.081	-10.559
St. error bootstrap	0.013	0.007	0.010	0.008
t-stat	-5.769	-11.347	-7.250	-10.042

Source: Author's estimates from HIES 2010-11 [*significance at 1%]

5.3.2 Impact of Remittances on Child Schooling

Using three indicators of child schooling i.e. Current enrollment, type of institution in which the child is going and the highest years of education (HSS=1) years completed, this study estimates the effect of remittances on child schooling. The child schooling indicator is defined as those children in the household with age 5 to 15 years, who are able to complete the secondary school education. So two specification are involved, one is the age specification and the other is the secondary school education specification.

To start with the current enrollment of the school going age children, it can be seen from Table 18 that the impact of remittances on the current enrollment is positive and significant under all the four measures of ATT. Under the NN method the receipt of remittances increases the school enrollment by 7.4 percent, for the Kernel method the increase in current enrollment is 8 percent, for the radius matching the affect is 12.6 percent and ATT affect for stratification method is 4

percent. Overall the affect ranges from 4 percent to 12.6 percent. This increase is due to the reason the remittances relax the budget constraint and are able to invest more on child education [(Bryant, 2005); (Lu and Trieman, 2005)].

Table 18: ATT Effect of Remittances on Current Enrollment (Yes = 1)

	NN matching	Kernel method	Radius method	Stratification method
ATT	**0.074***	**0.080***	**0.126***	**0.040***
N. treated	1812	1812	1176	1812
N. control	2264	28813	10105	29524
St. error	0.019	0.011	0.013	0.011
t-stat	3.941	6.940	9.716	3.627
St. error bootstrap	0.020	0.012	0.017	0.011
t-stat	3.743	6.936	7.318	3.705

Source: Author's estimates from HIES 2010-11 [*significance at 1%]

The second indicator to estimate ATT on child schooling is the type of institution that whether the child is going to private institution or exams or whether he/she is going to the govt. school or madrassa. It is evident from the Table 19 that acceptance of remittances has a positive and significant impact on the quality of education by the type of institution. The result is significant for all the four different specifications of ATT i.e. the receipt of remittances increases the chances of going to a private school by 13 percentage points overall. So it can be said that remittances help the households to seek better education for their children in Pakistan by opting for the private schools.

Table 19: ATT Effect of Remittances on Type of Institution (Private=1)

	NN method	Kernel method	Radius method	Stratification method
ATT	**0.138***	**0.136***	**0.130***	**0.135***
N. treated	1440	1440	914	1440
N. control	1635	18389	6059	18391
St. error	0.028	0.014	0.022	0.017
t-stat	4.965	8.30	5.925	7.724
St. error bootstrap	0.032	0.016	0.030	0.018
t-stat	4.247	8.326	4.346	7.427

Source: Authors estimates from HIES 2010-11 [* significance at 1%]

5.3.3 Impact of Remittances on Health Status of Women

To explain the impact of remittances on health of the household, this study is using the indicators like the pre-natal care of the married women (age15-49 years) during the last pregnancy

(Yes=1), immunization (TT injections) to married women during last pregnancy (Yes=1) and the place of child birth (Hospital=1).

The first indicator that is going to be explained is the pre-natal care during last pregnancy of the women of age 15 to 49 years. It is evident from the figures of the Table 20 that the receipt of remittances increase or ease the household budget constraint so that the household may be able to spend income on the care of pregnant women, which are in most of the cases also the head of household. The results are positive and significant. In the NN method the welfare effect for the prenatal care is 8.4 percent, while according to the kernel matching the households which receive remittances spend 4.8 percent more on the care of pregnant women. For radius method the ATT effect is 5.3 percent and 5.6 percent in stratification method. The results are highly significant only under all the four measures. All the specifications of the ATT are suggesting an increased percentage expenditure on the pre-natal care due to the receiving status of remittances. And the reason for it may be because care is provided by LHWs for free to pregnant women.

Table 20: ATT effect of remittances on Pre-natal care (Yes=1)

	NN method	Kernel method	Radius method	Stratification method
ATT	**0.084***	**0.048***	**0.053***	**0.056***
N. treated	863	863	650	863
N. control	1175	15328	6912	15328
St. error	0.023	0.015	0.017	0.016
t-stat	3.719	3.010	3.066	3.515
St. error bootstrap	0.025	0.016	0.021	0.017
t-stat	3.375	2.929	2.534	3.317

Source: Author's estimates from HIES 2010-11 [* significance at 1%]

Another indicator to analyze the welfare effect of remittances on the health status of the married women is the immunization facilities provided in Table 21. In the table below though the results are also satisfactory, these results suggest a significant positive relationship of remittances with the immunization provided to the married women by all the four different ATT measures. Remittances help the married women to afford the costly immunization treatments and medicines during pregnancy. Though a decent contribution in the immunization of the mother and child is made by the LHWs and LHVs but this is a time consuming process to consult them and many times these government workers are not in the their areas due to a flexible check and balance by the government and also the security reasons prevailing in Pakistan, so the remittance receiving households visit the hospitals to star the immunization treatment of the married women.

Table 21: ATT Effect of Remittances and Immunization (Yes=1)

	NN method	Kernel method	Radius method	Stratification method
ATT	**0.019***	**0.028***	**0.074***	**0.020**
N. treated	863	863	673	863
N. control	1175	15328	6981	15330
St. error	0.007	0.010	0.014	0.012
t-stat	2.415	2.333	5.442	1.657
St. error bootstrap	0.011	0.012	0.015	0.013
t-stat	1.72	2.306	4.765	1.607

Source: Author's estimates using HIES 2010-11 data [* significance at 1%]

The ATT effect according to the NN method is 1.9 percent, while it is 2.8 percent as per the Kernel method. The increase in immunization of the married women is increased by almost 7 percent and 2 percent by the radius and stratification matching respectively. So overall there is a positive relationship between remittances and immunization facilities provided to the married women in Pakistan.

The third indicator to explain the relationship between ATT effects of remittances and the health status of the household seen by the health status of the married women is the place of child born i.e. whether the child is born in the private hospital, government hospital, or home. The impact on delivery in a home is statistically significant under all the three ATT measures. The results depicted in Table 22 reflect the ability of the sampled women provided by the receipt of remittances to afford hospital deliveries and can have easy access to the government and private hospitals due to the fact that remittances increase the household income and the household has resources to pay for the deliveries in the hospitals and the other miscellaneous expenditures associated with it.

As shown by the figures established in the Table 22 below the ATT effect is between 1 percent to 17 percentage points for all the four different methods of matching suggesting a major positive addition to the health care expenditures.

Table 22: ATT effect of Remittances and Place of Child Birth (Hospital=1)

	NN method	Kernel method	Radius method	Stratification method
ATT	**0.172***	**0.021***	**0.033***	**0.019***
N. treated	871	871	673	871
N. control	1175	15421	6981	15423
St. error	0.073	0.006	0.007	0.008
t-stat	2.371	3.01	4.597	2.403
St. error bootstrap	0.103	0.007	0.008	0.007
t-stat	1.676	3.190	4.357	2.655

Source: Authors estimates from HIES 2010-11 [* significance at 1%]

5.4 Conclusion

An econometric multivariate analysis has been done in this chapter and three different variables were analyzed and estimated by using four different techniques of PSM analysis. This analysis has been carried out at the household level for studying poverty, for the children in the household of the school going age (5 to 15 years) to analyze child schooling and for the married women (15-49 years) in the household to investigate the ATT effects of remittances on poverty, current school enrollment, highest level of education achieved, type of institution selected, pre-natal care, immunization and place of child birth respectively. The ATT effect used in this study is the measure in which we compare the treatments or interventions in the randomized experiments. The difference between the mean or average outcomes between the units assigned to the control and the units assigned to the treated is measured by the ATT effect. The number of observations in N. control are different from the sample size 16341 because the sample is at the household level but the estimation techniques carried out for all the variables in different estimation techniques are at the individual level. For example number of children and the number of reproductive married female are greater than the sample size. Only the poverty variable is at the household level. And secondly N. treated and N. control are different in all the four matching techniques for each different variable because every matching technique deals differently with the propensity scores than the other, during the matching process.

The findings of this study show that remittances have a positive welfare effect on the poor households and the receipt of remittances increases the budget constraint of the poor, hence lifting such poor households which happen to be receiving remittances from the incidence of poverty. Another finding of this study is the positive ATT effect of remittances on the child schooling. Remittance receiving households have been seen to spend more on the child education and so the

current school enrollment for such households is high. On the other hand such households spend more in order to seek better quality of education for their school going age children and so there is a trend of admitting the kids into the private schools for the remittances receiving households.

Another conclusion drawn from the results of this study is also that the highest level of education achieved coefficient for the remittance receiving households is negative, suggesting that children of such households leave school early and are subject to drop out due to the poor performance in academics. There are a couple of reasons for this trend as suggested by the previous readings, the first one is the lack of parental control and attention due to migration and the other is that the children have to take social responsibilities at an early age that were initially executed by the parents, so there schooling is abruptly affected and thus are subject to drop out.

On the health side this study also depicts a positive relationship of remittances with the health status of the household, measured by the indicators like pre-natal care, immunization and place of child birth for married women in the household. This study confirms that the households which receive remittances tend to spend more on the care and immunization of the married women. Along with it the women of such households which receive remittances tend to opt for the hospital, whether government or private for the delivery due to increased household income. The reason is that due to the receiving of remittances the budget constraint of the households is eased and then can afford to pay for hospitals, for the travelling and other associated expenditures, if the household is at some distance from the home.

Chapter 6

Conclusion & Policy Recommendations

6.1 Conclusion

This dissertation had three broad objectives, to review the impact of remittances on poverty, secondly to estimate this impact for the child schooling and lastly to analyze this impact for the health status of the reproductive married women in the household. This study has divided child schooling into the current enrollment status and type of institution or school where the child is admitted. Health status of the reproductive married women has been measured on the basis of the indicators like prenatal care, immunization and place of child delivery. Furthermore, by using the bivariate and multivariate analysis in this study, these categories had been studied against different individual, household, regional and provincial characteristics.

It has been proven that remittances provide protection to the receiving households against income shocks, the risk capability of the lifecycle and smooth the budget constraint of household. Along with improving the general living conditions a significant increase in revenues is also provided by these transfers with handsome contributions for education, health and wellness in the communities of migrant origin. In the absence of credit markets and poor social security system provided by the government in Pakistan, these international transfers can also provide migrants and their families with the resources to invest and increase household assets and income. The contribution extent of the migration and remittances depends fundamentally on the broader conditions of development of the migrant sending societies, institutional development and environment of the migrant sending countries can also help or support remittances to have significant affects and contribution to household welfare. Thus providing social protection to the people, creation of a stable climate for investment and general development policies which aim at restoring political trust are the best policies to maximize the impact of remittances on the welfare of the migrant economies.

A number of the studies have been carried out earlier, nationally and internationally, to estimate the effect of remittances on poverty and household welfare by using counterfactual income function, CGE modelling and various other regression techniques. But in the majority of those previous studies there was a problem of selection biasedness. That is those studies were just

measuring the effect on poverty and other indicators for the household without taking into account the different observable characteristics of the households that can impact a lot on the status of household welfare and poverty, so chances of biased results are very favorable in those studies. At the national front there exists a vast literature and policy gap as only a very few studies directly has been done in Pakistan to gauge the impact of remittances on the child schooling and health status of the household welfare.

In this study the impact of international remittances on household welfare is analyzed, while using poverty status, current school enrollment, type of institution admitted, and pre-natal care to the married women, immunization and place of child delivery as the indicators of household welfare. Since it is a problem that we cannot observe a household before and after receiving remittances, so this study is using a standard methodology of propensity score matching. This approach allows to compare the transfer recipients with those households that do not receive remittances but have the observable characteristics that are the same as of the recipients of remittances. Then on the basis of this propensity score the study estimates the ATT effect of receiving remittances on the incidence of household welfare and thus also tackling the biasedness problem.

6.1.1 Data Sources and Summary of the Outcomes

This study has used Household Integrated Economic Survey 2010-11 conducted by Pakistan Bureau of Statistics. The HIES 2010-11 data covers all the four provinces (Punjab, Sindh, Khyber Pakhtunkhwa and Baluchistan) as well as the rural and urban regions. 16341 households are covered by the 2010-11 round of the HIES survey by taking subsample of 79000 households of District level survey. Important information on consumption expenditure, consumption patterns, household income, savings and liabilities is provided by HIES at national and provincial level with the rural/urban breakdown. An urban area frame has been developed by PBS, in which enumeration blocks are created. These enumeration blocks are the mutually exclusive division of all the urban areas comprising of cities and towns into small compact areas that are identifiable through maps. About 200-250 households on the average are included in each enumeration block along with the division into low, middle and high income groups in each block. 26,698 enumeration blocks are included in the urban areas sampling frame which had been updated through economic census conducted in the year 2003. As far as the rural areas are concerned,

population census 1998 has been used to include the lists of villages or mouzas in a sampling frame, in which each village is identifiable by its name. There are 50588 villages in this survey.

Propensity score matching is used to carry out the analysis, firstly the propensity scores are allotted to every household in the data according to the observable characteristics of the household i.e. individual characteristics, household characteristics and regional characteristics, using a logistic regression model. Based on these propensity scores the households are compared for the welfare impact on them due to receipt of remittances with those households that have the same characteristics but do not receive remittances.

As it is a known fact that there are around 0.4 million Pakistani migrants in the gulf region and in North America, UK, EU and other countries in the year 2014 only[8], the remittance transfers from abroad have been contributing to the economy quite significantly. Currently remittance inflows are estimated to be around 4 percent of our GDP and these are also an important source of foreign exchange reserves for a developing country like Pakistan. This study has examined the impact of remittances on household welfare in Pakistan. The conclusion of the key findings of this study is as follows:

6.1.2 Remittances and Household Poverty

Head count poverty estimate is used to analyze the impact of remittances on poverty. It is rational to consider that in the countries of migrant origin these flow of transfers can have a negative and direct effect on poverty of the households. This study found that remittances are an important factor to lift the households out of the poverty line. The empirical results show that receiving remittances from abroad reduces the probability of the household to be in the head count poverty by almost 8 percentage points by all the four measures of propensity score matching. The receipt of remittances soothes the household budget constraint and increases the household income to be spent on the food and non-food necessities of the life.

6.1.3 Remittances and Child Schooling

To study the impact of remittances on child schooling of the children of the children with age 5 to 14 years, three different indicators are incorporated in this study such as current school enrollment, type of institution in which the child is admitted and the highest level or years of

[8] Bureau of Emigration and Overseas Employment

education completed. As far as the impact on the current enrollment of the children is concerned remittances are seen to be positively affecting the current enrollment and increasing the enrollment up to 12 percentage points for the remittance receiving households.

Than for the variable of type of institution in which the child is admitted the results are also positive and significant. Acceptance of remittances has a positive and significant impact on the quality of education by the type of institution selected for the children. The result is significant for all the four different specifications of ATT i.e. the receipt of remittances increases the chances of going to a private school by 13 percentage points overall. So it can be said that remittances help the households to seek better education for their children in Pakistan by opting for the private schools.

6.1.4 Remittances and Health Status of the Women

To see the impact of remittances on the health status of the reproductive married women, the indicators such as the pre-natal care provided to the married women (15 to 49 years of age), immunization and the place of child birth are used. For the pre-natal care the results are positive, strong and significant and the overall effect is the increase in the pre-natal care from 4 to 8 percentage points. Suggesting that remittances increase the household budget which is then spent on the pre-natal acre of the married women who in a large number of cases also happen to be the household head. After this the effect of remittances on the immunization facilities provided to the married women is also positive and significant. The receipt of remittances increases the immunization facilities provided to the married women by 2 to 7 percentage points. Also supporting the notion that remittances increase the household income and thus the household is able to spend more on the immunization.

The last result of this health category is also positive and highly significant. The receipt of remittances happens to increase the budget of the household and thus the married women are able to spend more for the better delivery facilities provided in the private or government hospitals and does not prefer delivery at home. This is also due to the fact that remittances increase the ability of the household to pay for the delivery expenditures and the miscellaneous spending's associated with it like travelling, as in most of the cases the hospital are only in the main cities so the patient has to afford the conveyance to the hospital visited.

6.2 Policy Recommendations

Following are some recommendations that are suggested on the basis of the results drawn from this study:

- Considering the importance of remittances concluded in this study for the household welfare in Pakistan, it is suggested that the Government of Pakistan should focus on raising the awareness of the households for the possibilities of investing more of the remittances in the education and healthcare of the family members, which would then have a long-term positive effect on the socio-economic development of Pakistan.
- For the migrants who are returning home, or the households which are receiving transfers and who are wishing to set up some kind of business, fiscal incentives like tax breaks or other related concessions should be provided.
- Along with it government should also take some measures to make remittances more redistributive by making the tax system more progressive, while also taking care of the remittance sender interests.
- To ensure future remittance cash flows a special exchange rate may be offered on remittances arriving in special savings accounts in domestic financial institutions.

References

- Abbas, K., Sabir, H. M., Shehzadi, A., & Abbas, Q. (2014). Impact of Workers' Remittances on Household Welfare in District Jhang (A Case Study of Tehsil 18 Hazari). Journal of Finance and Economics, 2(4), 131-135.
- Acharya, C. P., & Leon-Gonzalez, R. (2013). The Impact of Remittance on Poverty and Inequality: A Micro-Simulation Study for Nepal. Asian Journal of Empirical Research, 3(9), 1061-1080.
- Acosta, P., Calderon, C., Fajnzylber, P., & Lopez, H. (2008). What is the impact of international remittances on poverty and inequality in Latin America? World Development, 36(1), 89-114.
- Adams Jr, R. H. (1998). Remittances, investment, and rural asset accumulation in Pakistan. Economic Development and Cultural Change, 47(1), 155-173.
- Adams Jr, R. H. (2002). Precautionary saving from different sources of income: Evidence from rural Pakistan.
- Adams Jr, R. H., & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries? World development, 33(10), 1645-1669.
- Adams, R. (2006). Remittances, poverty and investment in Guatemala. International Migration, Remittances and the Brain Drain Washington DC: World Bank, 53-80.
- Adams, R. H. (2006). Remittances and poverty in Ghana (Vol. 3838). World Bank Publications.
- Ahmed, V., & Wahab Siddiqui, A. (2010). Nexus between aid and security: the case of Pakistan
- Amuedo-Dorantes, C., & Pozo, S. (2011). New evidence on the role of remittances on healthcare expenditures by Mexican households. Review of Economics of the Household, 9(1), 69-98.
- Amjad, R., Irfan, M., & Arif, G. M. (2013). How to Increase Formal Inflows of Remittances: An Analysis of the Remittance Market in Pakistan.
- Anyanwu, J. C., & Erhijakpor, A. E. (2010). Do International Remittances Affect Poverty in Africa?*. African Development Review, 22(1), 51-91.

- Becker, S. O., & Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. The stata journal, 2(4), 358-377.
- Beine, Michel, Frederic Docquier and Hillel Rapoport (2007): Brain drain and human capital formation in developing countries: winners and losers, Economic Journal.
- Borraz, F. (2005): "Assessing the impact of remittances on schooling: the Mexican experience", Global Economy Journal, 5 (1).
- Brown, S. S. (2006). Can Remittances Spur Development? A Critical Survey1. International Studies Review, 8(1), 55-76.
- Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. Journal of economic surveys, 22(1), 31-72.
- Castañeda, E.,& Buck, L., (2011): "Remittances, Transnational Parenting, and the Children Left Behind: Economic and Psychological Implications." The Latin Americanist 55:85-110.
- Commander, Simon, Maria Kangasniemi and Allan L. Winters (2004): The brain drain: curse or boon? A survey of the literature, in R. Badlwin and L.A. Winters, eds.: Challenges to Globalization, The University of Chicago Press, Chapter 7.
- Córdova, J. E. L. (2006). Globalization, migration and development: the role of Mexican migrant remittances (Working Paper ITD= Documento de Trabajo ITD; n. 20) (Vol. 20). BID- INTAL.
- Cox, E., A., & Ureta, M. (2003): "International migration, remittances, and schooling: Evidence from El Salvador", Journal of Development Economics, Special Issue, 72 (2), 429-61.
- De Haas, H. (2007). Remittances, migration and social development. UNRISD Programme paper, (34).
- Esquivel, G., & Huerta-Pineda, A. (2006). Remittances and poverty in Mexico: a propensity score matching approach. Mimeo.
- Francesca Marchetta, & Bertoli, S. (2014). Migration, remittances and poverty in Ecuador (No. 201407). CERDI.
- Freund, C., & Spatafora, N. (2005). Remittances: transaction costs, determinants, and informal flows.

- González-König, G., & Wodon, Q. (2002). Remittances and inequality. World Bank, Washington, DC Processed.
- Grossman, M. (1972): "On the Concept of Health Capital and the Demand for Health", Journal of Political Economy, 80: 223-255.
- Gubert, F., Lassourd, T., & Mesplé-Somps, S. (2010). Do remittances affect poverty and inequality? Evidence from Mali. Document De Travel DT/2010-08, Paris-Dauphine University.
- Hanson, Gordon H. and Christopher Woodruff (2003): Emigration and educational attainment in Mexico, Mimeo. University of California at San Diego.
- Hildebrandt, N. and McKenzie, D. (2005): The Effects of Migration on Child Health in Mexic, Economia 6(1): 257-289.
- Javid, M., Arif, U., & Qayyum, A. (2012). Impact of remittances on economic growth and poverty. Academic Research International Vol, 2.
- Jones, R. C. (1998). Remittances and Inequality: A Question of Migration Stage and Geographic Scale*. Economic Geography, 74(1), 8-25.
- Kanaiaupuni, S. and Donato, K. (1999): "Migradollars and mortality: the effects of migration on child mortality, Demography 36, pp. 339–353.
- Kerr, J. M. (1996). Sustainable development of rain fed agriculture in India (No. 20). International Food Policy Research Institute (IFPRI).
- Levitt, Peggy. (1998): "Social Remittances: Migration Driven Local-Level Forms of Cultural Diffusion" International Migration Review, Vol. 32, No. 4, pp. 926-48.
- Lopez-Cordova, E. (2005): "Globalization, Migration, and Development: The Role of Mexican Migrant Remittances" Economia, Journal of the Latin, American and Caribbean Economic Association, LACEA, vol.6, num.1, fall 2005.
- Lucas, Robert E. B. (2005): "International Migration and Economic Development: Lessons from Low-Income Countries", Northampton, MA and Cheltenham, UK: Edward Elgar.
- Mansoor, A., and B. Quillin. (2007): Migration and Remittances: Eastern Europe and the Former Soviet Union. Washington DC: The World Bank.
- Mansuri, G. (2007). Does work migration spur investment in origin communities? Entrepreneurship, schooling, and child health in rural Pakistan. International migration, economic development and policy.

- Mara, I., Narazani, E., Saban, N., Stojilovska, A., Yusufi, I., and Zuber, S. (2012): "Analysis of literature on the effects of remittances on education and health of family members left behind", in Migration and development in Albania and Macedonia: the effects of remittances on education and health of family members left behind. Skopje/Tirana, ACSER/Analytica.
- McKenzie, D. J. & Rapoport, H. (2006): "Can Migration Reduce Educational Attainment? Evidence from Mexico." World Bank Policy Research Working Paper No. 3952
- McKenzie, D. J. (2007): Beyond Remittances: The Effects of Migration on Mexican Households. In Ozden (Ed.), International Migration, Remittances & the Brain Drain: The World Bank Palgrave McMillan.
- Mughal, M., & Diawar, B. (2010). Impact of Remittances on Inequality and Poverty: Macro and micro-evidence from Pakistan.
- Nasir, M., Tariq, M. S., & Faiz-ur-Rehman, (2011). The Effect of Foreign Remittances on Schooling: Evidence from Pakistan. Working Papers & Research Reports, 2011.
- Park, a., Lee, L., de Brauw, A. (2010): "Parental Migration and Child Well-being in Developing Countries With Some New Evidence from China" mimeo
- Ratha, D. (2007, February). Leveraging remittances for development. In Second Plenary Meeting of the Leading Group on Solidarity Levies to Fund Development (Vol. 6, No. 7).
- Ratha, D., & Maimbo, S. M. (2005). Remittances: Development Impact and Future Prospects. World Bank.
- Ravallion, Martin, 1994, Poverty Comparisons, Fundamentals in Pure and Applied Economics Volume 56, Harwood Academic Publishers.
- Rodriguez, E. R. (1998). International migration and income distribution in the Philippines. Economic Development and Cultural Change, 46(2), 329-350.
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. Biometrika, 70(1), 41-55.
- Siddiqui, R., & Kemal, A. R. (2006). Remittances, trade liberalization, and poverty in Pakistan: The role of excluded variables in poverty change analysis. The Pakistan Development Review, 383-415.
- Suleri, A. Q., & Savage, K. (2006). hpg. Remittances in Crises: a Case Study from Pakistan.

- Taylor, J. E., Mora, J., Adams, R., & Lopez-Feldman, A. (2005). Remittances, inequality and poverty: Evidence from rural Mexico.
- Vidal, (1998): The Effect of emigration on human capital formation, in Journal of Population Economics, vol. 11, pp. 589-600.
- Wahba, S. (1996): Temporary labour migration in Egyptian agricultural households: Implications for gender differences in school enrolment. Forum, 3 (4).
- World Bank. (2006): Global Economic Prospects: Economic Implications of remittances and migration. Washington DC: World Bank.
- Yang, D. (2008): "International Migration, Remittances, and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks," in Economic Journal, Vol. 118, pp. 591-63.
- Yang, D., & Choi, H. (2007). Are remittances insurance? Evidence from rainfall shocks in the Philippines. The World Bank Economic Review, 21(2), 219-248.

Appendix

Appendix Table 1: Official Remittances from Selected Countries of Origin (Millions USD)

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Saudi Arabia	627.2	750.4	1023.6	1251.3	1559.6	1917.7	2670.1	3687	4104.7	5183.9
UAE	712.6	716.3	866.49	1090.3	1688.6	2038.5	2597.7	2848.9	2750.2	3462.3
Dubai	532.9	540.2	635.60	761.24	970.42	851.54	1201.2	1411.3	1213.8	1724.7
Abu Dhabi	152.5	147.9	200.40	298.80	669.4	1130.3	1328.8	1367.6	1485.0	1687
Other GCC countries	512.1	596.5	757.3	983.4	1202.7	1237.9	1306.2	1495.0	1607.9	2039.8
US	1294.1	1242.5	1,459.6	1762.0	1735.9	1771.2	2068.7	2334.5	2186.2	2721.2
UK	371.9	438.7	430.0	458.87	605.59	876.38	1199.7	1521.1	1946.0	2428.1
Other EU countries	101.51	119.62	149	176.64	247.66	252.21	354.76	364.8	357.37	476.1
Other Countries	417.25	573.31	642.11	530.39	609	577.37	653.26	562.14	568.88	733
Encashment FEBCs	16.25	12.09	2.68	2.40	0.48	1.02	0.07	0.08	1.02	0.56
Total	4168.8	4600.1	5493.7	6451.2	7811	8,906	11201	13186.6	15592.4.6	20456.6

EU = European Union, FEBC = foreign exchange bearer certificates, FY = financial year, GCC = Gulf Cooperation Council. **Source:** State Bank of Pakistan

Appendix Table 2: Average of Official Remittances per Working Pakistani (US$) per Year

Country	2004	2010	2012
All countries	1,049	1,777	1,968
Adjusted	(1,614)	(2,733)	(3,027)
Saudi Arabia	570	1,780	2,168
Adjusted	(713)	(2,225)	(2,710)
UAE	1,425	2,038	2,374
Adjusted	(1,781)	(2,547)	(2,967)
US	1,425	2,038	2,374
Adjusted	(2,850)	(4,076)	(4,748)
UK	465	1,188	1,267
Adjusted	(930)	(2,376)	(2,534)

Note: Adjusted for number working out of total stock: 0.65 for all countries, 0.8 for Saudi Arabia and the UAE, and 0.5 for the US and UK. **Source:** Pakistan, Planning Commission

Appendix Table 3: Trends in Average Remittances Growth Rates in Three Selected Countries (%)

Period	Bangladesh	The Philippines	Pakistan
1981–85	10.2	8.4	5.2
1986–90	9.7	12.9	-4.3
1991–95	9.3	30.8	-2.1
1996–2000	10.4	8.1	-6.1
2001–05	17.4	14.5	39.7
2006–10	20.8	9.6	17.8
2006	25.8	12.4	19.6
2007	20.9	6.9	17.1
2008	36.2	14.4	17.4
2009	17.7	6.0	23.8
2010	3.1	8.4	11.2
2011	10.6	7.2	26.6
2012	13.5	8.5	27.3

Source: Remittances data, World Bank, Development Prospects Group (2011)