



Remittance inflows to Pakistan : nature, determinants and economic impacts

Mazhar Yasin Mughal

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Université de Pau et des Pays de l'Adour
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(CATT)



LES TRANSFERTS DE FONDS AU PAKISTAN: LEUR NATURE, LEURS DETERMINANTS ET LEURS IMPACTS ECONOMIQUES

REMITTANCE INFLOWS TO PAKISTAN: NATURE, DETERMINANTS AND ECONOMIC IMPACTS

Thèse pour le Doctorat en Sciences Economiques
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Le 6 Decembre 2012 par
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*This work is dedicated to those two kind souls all of whose efforts,
hopes and prayers have always remained focused on my growth and success : my parents.*

Thanks Ammi Abbu!

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ABSTRACT

Pakistan is one of the major remittance-receiving countries. Foreign remittances to the country exceed other public and private financial inflows. In this study, we examine some aspects pertaining to the nature, causes and consequences of migrant remittances. We find that remittances to Pakistan are relatively stable, and are motivated by mainly altruistic reasons. They also respond to host-country economic conditions. They also appear to lower the incidence, depth and severity of poverty in the country, and reduce economic inequality. However, remittances induce symptoms of Dutch disease in the economy, and are associated with falling trade competitiveness. Moreover, foreign remittances lead to a reduction in labour participation among the recipients. As a result, their over all influence on Pakistan's economy is a mixed one, and their use as a part of the country's development plans requires careful thinking. In the light of our findings, we highlight the challenges the country faces from sustained large inflows of remittances and suggest the measures which could maximize their beneficial impacts and avoid the pernicious ones.

Keywords: Remittances, Developing Countries, Pakistan, volatility, Dutch disease, poverty, inequality, labour supply.

JEL Codes: O10, O15, F40.

RESUME (FRENCH)

Le Pakistan fait partie des dix grands pays qui reçoivent des transferts de fonds des immigrants. Les transferts de fonds qui arrivent dans le pays dépassent les autres flux publics ou privés. Dans cette étude, nous analysons quelques aspects de ces transferts de fonds, en ce qui concerne leur nature, leurs causes ainsi que leurs conséquences. Nos résultats montrent qu'ils constituent un flux relativement stable. Ils sont envoyés particulièrement pour des raisons altruistes. Les transferts réagissent également aux conditions des pays d'accueil des immigrants. D'ailleurs, nous constatons qu'ils diminuent l'incidence, la profondeur et la sévérité de la pauvreté au Pakistan et atténuent les inégalités économiques. Néanmoins, ces flux provoquent les symptômes du syndrome hollandais et sont associés à la baisse de compétitivité. Les transferts provenant de l'étranger engendrent une baisse de la participation au travail de ses bénéficiaires au Pakistan. Par conséquent leur impact global sur l'économie est mitigé. C'est pourquoi le rôle des transferts de fonds dans un plan pour le développement de l'économie demande une réflexion attentive. A la lumière de nos recherches, nous

soulignons les défis auxquels le pays est confronté en raison des flux incessants des transferts de fonds. Nous suggérons donc quelques mesures qui permettent d'optimiser leurs bienfaits et éviter les effets néfastes.

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CHAPTER 1: INTRODUCTION

1.1 FOREWORDT

Migration has been one of the key phenomena shaping the human history. Its importance has not faded in the recent past, and improved transportation has even made long-distance migration easier. Today, an estimated 215 million people (almost three percent of the world's population) live outside their native countries (United Nations 2009). Migration affects the home economy in a number of ways (Azam and Gubert 2006). One of the main consequences of migration, and arguably the most important in monetary terms, is the remittances that migrants send to their country of birth. Remittances have been rising for the last four decades, having roughly quadrupled between 1976 and 2010 (World Bank 2011a). Remittances to developing countries have grown more rapidly, overtaking those destined to developed countries. Migrants from developing countries are estimated to have sent over \$315 billion to their home countries in 2009 (Ratha et al. 2010).

Remittance flows today make up over three times of the Official Development Assistance to developing countries, and for many low- and middle-income countries, constitute the most significant source of foreign exchange. This phenomenal rise of remittance flows to developing countries has generated lots of interest, not only in the academia, but also among the policy-makers and the public at large. While governments in developed countries grapple with the question of immigration, migrant-sending countries confront the economic and social challenges and opportunities that the ensuing remittances offer. Some developing countries have in recent decades made migration and remittances a part of, if not the centerpiece of their development strategies. Philippines, Morocco, Mexico and other Central American and Caribbean countries are good examples of this strategy being implemented since the 1980s. A growing body of theoretical and empirical research has studied the growth and development implications of remittances on the household, community and economy level. Areas examined have included interaction of remittances with welfare, growth, trade, monetary system, labour and financial markets in home as well as host countries.

However, empirical research has not kept pace with the spectacular rise in remittances. The South Asian state of Pakistan has witnessed above average flows even in the context of developing countries. Formal remittances to the country have grown almost thirty fold

between 1976 and 2011, and today form the country's second highest foreign exchange earning category after the country's primary exports of textiles and garments. The country is one of the top ten remittance-receiving countries in the world, with inflows above \$12 billion in 2011 (State Bank of Pakistan 2012). Nonetheless, empirical studies on these flows are scarce and the role of remittances in the country's development remains unclear¹.

In this thesis, we attempt at bridging the gap in empirical literature by taking up some of the empirical questions the flows of foreign remittances raise in the context of Pakistan. But before that, let us briefly introduce the Pakistani economy (section 1.2) and the remittances it receives (section 1.3).

1.2 OVERVIEW OF THE PAKISTANI ECONOMY

Pakistan is a middle-sized country in South Asia, neighbouring India, China, Afghanistan and Iran, with 1200 sq. km. of coastline on the Arabian sea. The country sits at a position of geostrategic importance at the cross-road of South and Central Asia and the Middle East. Pakistan is a mosaic of distinct landscapes, climates, ethnicities and languages. It has a surface area of 796,096 sq. km. and a population estimated at 175 million in 2010 (Government of Pakistan 2011). From 33 million in 1951, Pakistan's population has grown five-folds in the last sixty years. Today, Pakistan is the world's sixth most populous country, and the fourth most populous in Asia.

The economy has grown even more strongly. At the time of independence from Britain in 1947, Pakistan was a poor, overwhelmingly agrarian country. Since then, the country has substantially evolved, gradually graduating to middle-income group with a purchasing power parity per capita income of \$2,600 in 2010 (World Bank 2011b). The Average growth rate has remained a robust 5.1 percent in the last sixty years (State Bank of Pakistan 2011). This is despite continuing political instability with periods of unstable democratic governments

¹ For instance, Google Scholar shows only 15 unique results for studies on Pakistani remittances during the last decade, two of which are earlier versions of section 3.2 and chapter 4 of this thesis presented in various conferences. These studies are limited in scope, and other than district-specific studies, mostly deal with remittances' correlation with the growth rate.

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punctuated by military rule, and periodic natural catastrophes that have devastated the country. Growth has fluctuated, as a result, from an average of 3.1 % in the 1950s to 6.8 % in the 1960s to 4.8 % in the 1970s, followed by 6.1 %, 4.4 % and 5.4 % in the 1980s, 1990s and 2000s respectively. The country has gone through several phases in its economic history. The government-planned-and-directed era of industrialization and green revolution in the 1960s was followed by mass nationalization in the 1970s. Since the late 1980s Pakistan has begun liberalizing the economy and privatizing the state-owned industry. The decade of 2000s saw high foreign investments and private consumption-led growth.

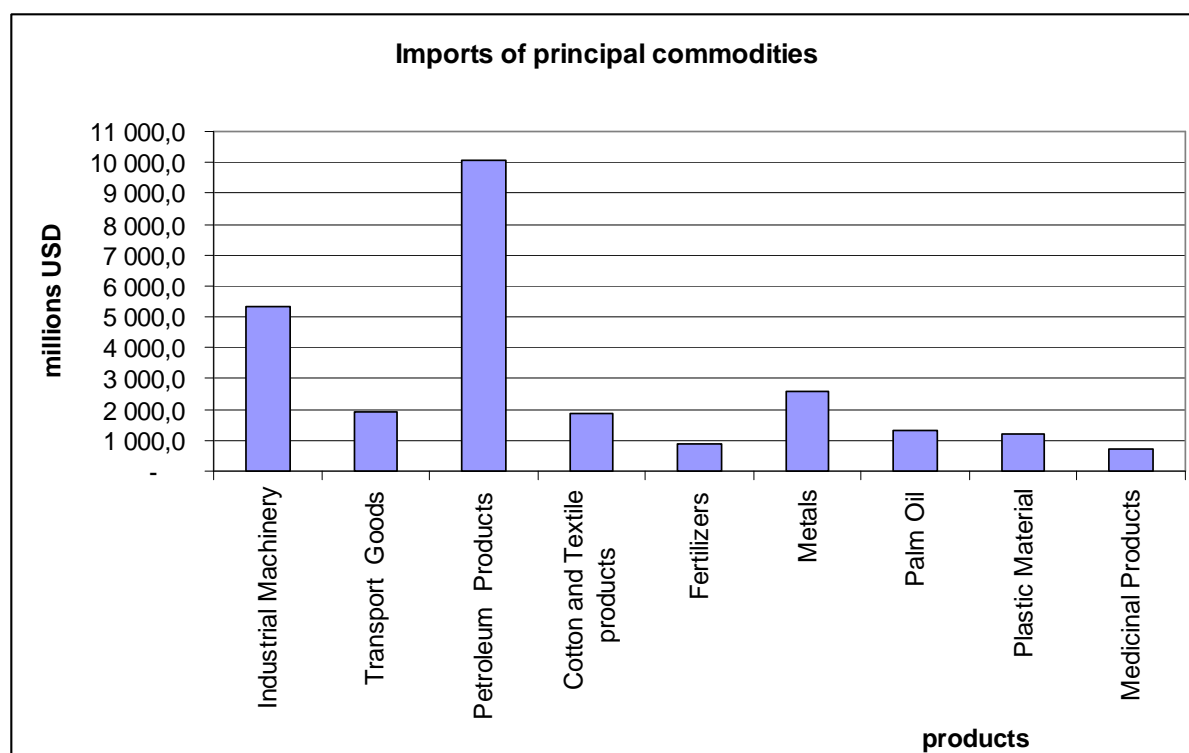
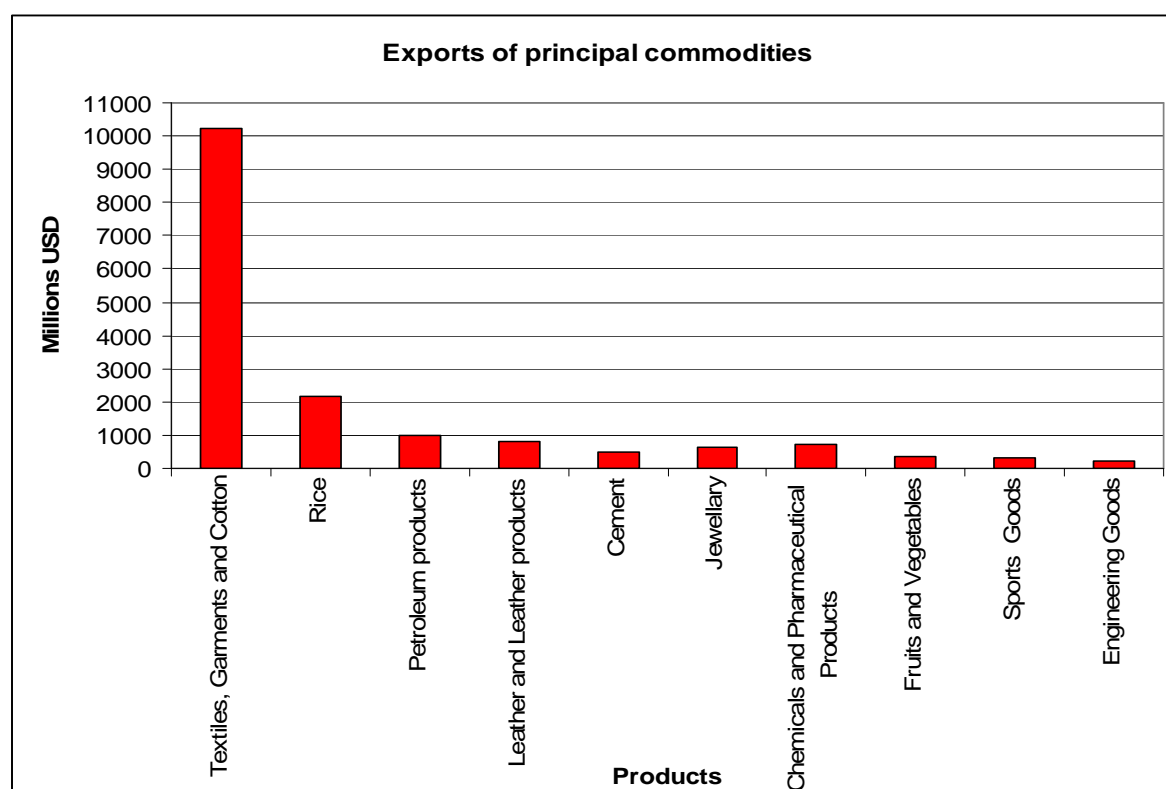
Table 1.1. Sectoral distribution of the Pakistani economy

Sector	1950s	1960s	1970s	1980s	1990s	2000s
Agriculture	49.066	40.741	33.700	28.551	26.065	22.262
Industry	12.860	19.072	22.637	23.258	24.652	25.239
Services	38.370	40.185	43.661	48.189	49.378	52.497

Source: Author's calculations using State Bank of Pakistan (2011)

In the last 65 years the country's economy has substantially diversified, and now the country boasts a sizeable industrial and services sector (Table 1.1). The services sector makes up over half of the economy's value-added, main services being transport and telecommunications, banking, trade and construction. Agriculture contributes to 20 percent of the country's annual output. Major crops include wheat, cotton, rice and sugarcane along with fruits, vegetables and lentils. The country also hosts a considerable dairy and meat farming sector. Cotton serves as an input for the textile and garments industry, which constitutes over half of the country's exports. Other major exports are rice, leather, sports goods, surgical equipment, fish, fruits, and light manufactured goods (Figure 1.1).

Figure 1.1. Major imports and imports of Pakistan in the financial year 2010



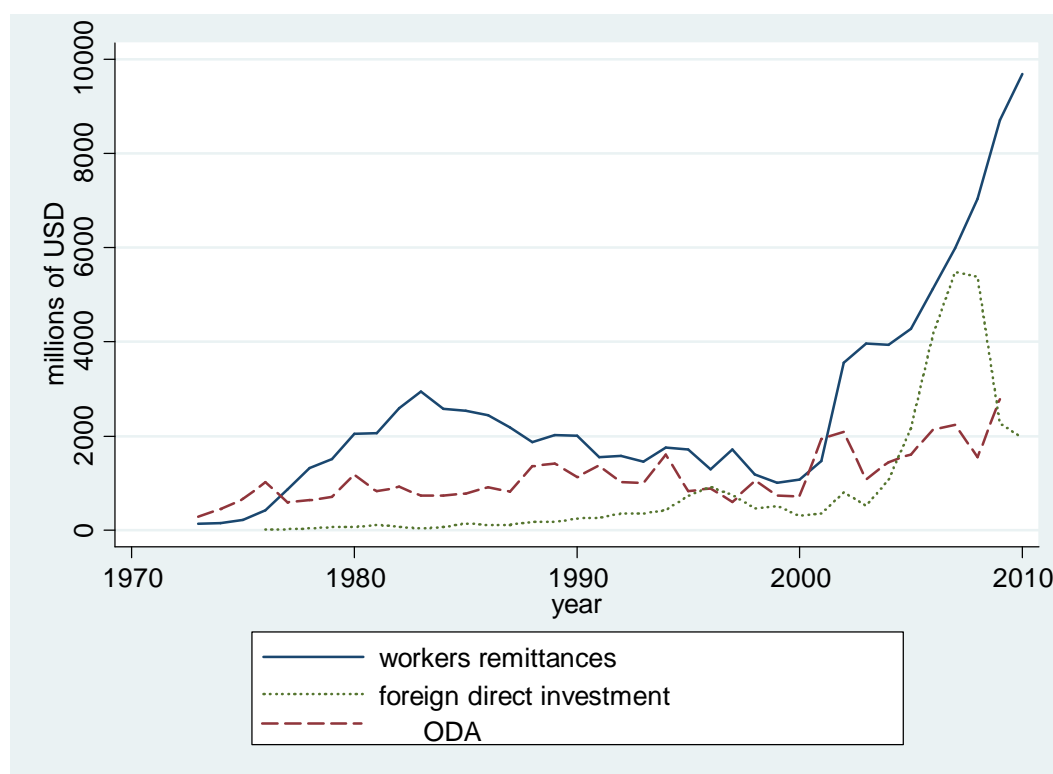
Source : Author's calculations using State Bank of Pakistan (2011)

Gulf states, European Union and United States are Pakistan's principal trade partners. Pakistan's exports in financial year 2010 stood at \$19 billion, 15 billion dollars less than the country's import payments (State Bank of Pakistan 2011). Main import items include crude oil, industrial machinery, transport and communication equipment, vegetable oil and food items. The country has faced chronic trade deficit, which has occasionally led to balance of payment crises and regular devaluation in the Pakistani Rupee. As a result, the country has had to resort to the International Monetary Fund and other international lending institutions. Debt service payments have taken as much as half of the annual federal budget causing stunted growth and weak social development. Government has often resorted to private domestic borrowing to cover its budget deficit, crowding out private investment and raising money supply. Therefore, inflation has remained moderately high (sometimes even in double digits). This notwithstanding, the country has never faced hyperinflation.

1.3 REMITTANCES TO PAKISTAN

As in the case of its South Asian neighbours, remittances to Pakistan have experienced a sharp and sustained increase in recent years, growing from under \$1 billion in 1999 to over \$12 billion today (State Bank of Pakistan, 2012). Remittance flows to Pakistan exceed the capital inflows from foreign direct investments, foreign aid and development assistance (figure 1.2), making up the second most important source of foreign capital behind the receipts from cotton and textile exports, and under current trends, may soon surpass them.

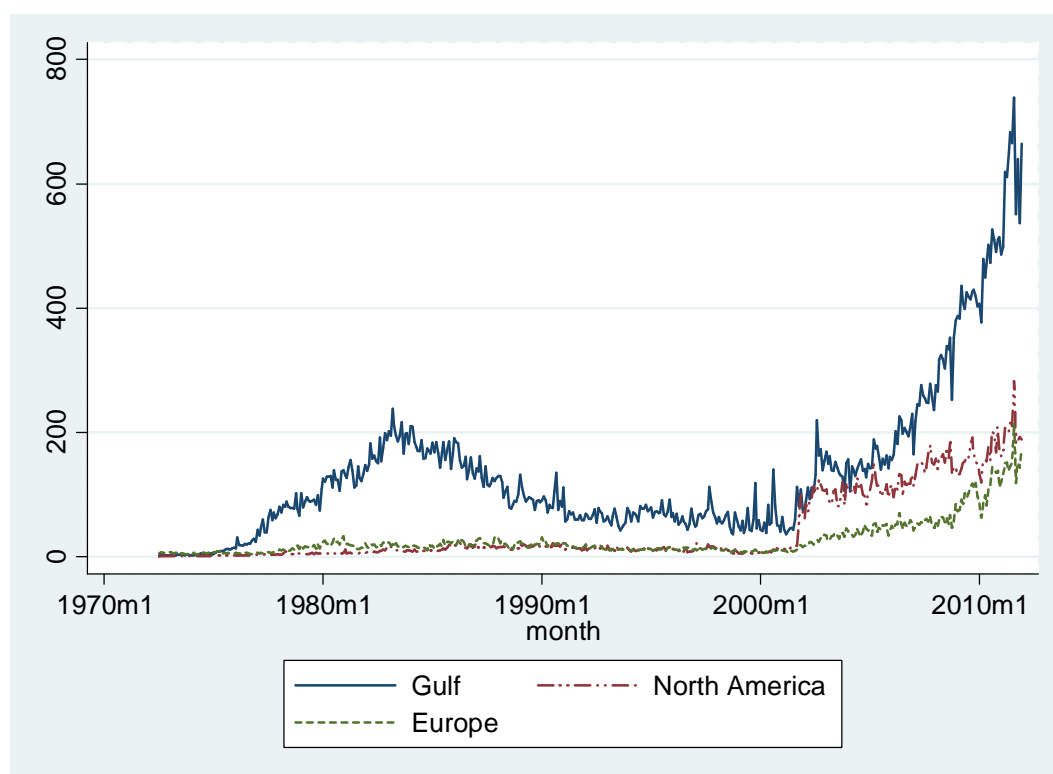
Figure 1.2. Remittances, Foreign Direct Investments and Official Development Assistance to Pakistan (1973 – 2010)



Source: Author's calculations using World Bank World Development Indicators (2011)

Today, remittances comprise about 6 per cent of the GDP, which compares favourably with many developing countries. Persian Gulf, North America and Europe are the main sources of remittances, and remittances from the United States, Saudi Arabia, the United Arab Emirates, the United Kingdom and the Gulf states of Kuwait, Qatar, Bahrain and Oman together constitute over four fifth of Pakistan's annual receipts (figure 1.3). The bulk of the country's remittances flow to the two northern provinces of Punjab and Khyber-Pakhtunkhwa (KPK).

Figure 1.3. Region-wise receipts



Source: Author's calculations using State Bank of Pakistan (2012)

Pakistan has been one of the major labour-exporting and remittance-receiving countries in the past decades. The estimates of Pakistani immigrants range from 3.5 million (United Nations 2009) to over 7 million, including illegal immigrants and overstayers, (Government of Pakistan 2010). Though many of them, especially those proceeding to North America and the European Union, have gone abroad on their own, the Pakistani government has also facilitated temporary migration to Persian Gulf and some East Asian countries through the Bureau of Emigration and Overseas Employment.

Remittances to Pakistan first picked up in the 1970's, when the construction boom in the Persian Gulf engaged millions of Pakistani temporary migrants. Remittances from these migrants peaked in the early 1980's, when they outstripped exports as the biggest source of foreign capital, accounting for as much as 10 % of the country's GDP. At that time, Pakistan was receiving about half of the remittances sent to the Indian Subcontinent.

These flows slowed down during the cheap oil period of the late 1980's and the 1990's with the weakening of Arab economies. The Gulf war in the early 1990's also had a dampening

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effect on remittances. The yawning gap between the official and the market exchange rate during the 1990s also contributed to orienting the remittances towards informal channels.

The steps taken by the government to promote migration and attract more remittances have often been in reaction to increased international demand for labour. In the 1970's, with the onset of the construction boom in the region, hundreds of thousands of Pakistani workers, mostly unskilled or semi-skilled, emigrated to the Persian Gulf. The government of Pakistan took some tentative steps for the promotion of semi and skilled labour export through the establishment of technical institutes in the country, exploring new labour markets and facilitating the emigration process. The Bureau of Emigration and Overseas Employment (BEOE), established in 1971 and working under the Ministry of Overseas Pakistanis, Government of Pakistan, is the government agency in charge of regulation, facilitation and monitoring of the emigration process. Between 1971 and 2006, some 3.87 million Pakistanis went abroad for work through over 1,100 BEOE authorized private employment promoter agencies (OEPs).

The second and ongoing phase of growth in official remittances began in the aftermath of the tragic events of September 11, when in the financial year 2001-02 remittances to Pakistan more than doubled. This ongoing phase has seen a sharp and sustained rise in remittance inflows from all the major concentrations of Pakistanis around the world. Official remittances from the United States have risen the most, from a mere \$73.3 million in 2000 to over \$1.8 billion in 2010.

The sharp rise of remittance flows to Pakistan since 2001-02 can partly be attributed to curbs on informal remittance-transferring channels, known as Hundi or Hawala, which provided immigrants with a quick, cheap and free from bureaucratic hassle method of delivering money to their families back home. Other reasons include panic transfers in the immediate aftermath of Sep 2011 attacks and the passing of the Patriot Act in the USA, the maturing of the Pakistani Diaspora in North America and the European Union, an increase in the number of Pakistanis abroad, changing education and skill profile of the Pakistani migrants, diminishing black market premium since the free float of the Pakistani Rupee, and the reduction in the cost of remitting and the desire to avail themselves of the opportunities offered by an expanding economy during the 2000s. Overseas Pakistanis are thought to have

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substantially participated in the record rise of Karachi Stock Exchange (KSE), the country's prime stock market², as well as in the real-estate boom. An important factor behind the rise of remittances is the shift towards more skilled and qualified migration from the country (Kock and Sun 2011).

In 2009, realizing the potential for increased remittance inflows in filling the chronic current account gap - knowing that much of the remittances to the country came through unofficial means (Government of Pakistan 2008) -, the government decided to launch the Pakistan Remittance Initiative (PRI). The objective of the initiative is to facilitate, and support a faster, cheaper, convenient and efficient flow of remittances. For this purpose, the national airlines PIA, Pakistani embassies and missions abroad, the state bank and other domestic banks are collaborating to ensure inexpensive, easy and tax-free within-hours transfer of money to Pakistan.

Lately, not only has the volume of remittances to Pakistan increased, but the average size of remittances has also grown, jumping from Rs. 48 thousand in 1996-97 to Rs. 151 thousand in 2007-08 (Irfan 2011). This means an increase by a third in real terms. According to the 2005-06 and 2007-08 Household Integrated Economic Surveys, close to 5 % households reported having received foreign remittances during the year preceding the survey. Rural migrant households and those in the top income quintile receive the highest share of remittances.

These remittances have improved Pakistan's balance of payment situation and helped the country cope with several natural disasters that have struck the country in the recent past. For instance, many victims of the deadly October 2005 earthquake in northern Pakistan were able to get back on their feet thanks to financial support from the Pakistanis abroad³ (Suleri and Savage, 2006). In the wake of the devastating floods in the country during July-August 2010 too, money transfers to Pakistan grew substantially. Similarly, several philanthropic projects in the past have been launched and sustained through foreign remittances (Najam 2006).

² The KSE rose from 1,247 points shortly before the September 11 attacks to over 15,000 points in early 2008 (Oda, 2009).

³The amount remitted to the country jumped by 9 percent in the aftermath of the October 2005 earthquake, in contrast to an average monthly growth of 1 percent in the period 1996 - 2010.

1.4 OBJECTIVES

The objective of this thesis is to study the role migrant remittances have played in the Pakistani economy and gauge their development implications. What is the nature of these flows? What are their main defining characteristics? How have they impacted the country's international trade competitiveness? What has been their impact on the country's poverty and inequality levels? Are these remittances really Manna from Heaven; a silver bullet out of the blue? or do they have their down side? More importantly, can a developing country, such as Pakistan, employ these inflows for its development? Or should it treat them as private transfers among its citizens, mostly from their own kith and kin, and hence of little use as a development tool? This study aims at analyzing these questions in the light of recent evidence. By finding answers to these questions, we can understand the way in which foreign remittances have fared so far, the means and channels through which they have impacted the economy, and subsequently judge their potential for the country's development. In the light of this analysis, we can discern the ways in which the beneficial effects of remittances on Pakistan's economy can be maximized.

We first examine the stability or otherwise of remittances to Pakistan using monthly remittance data from July 1972 to December 2011. The aim is to comprehend the nature of remittance flows entering Pakistan from various parts of the world. Secondly, we examine the key drivers of remittances both from the home and the host country perspectives. To do so, we use micro-level household economic survey data as well as annual aggregates for the last three decades. This sheds light on the factors that shape and determine the incidence and volume of foreign remittances to Pakistan.

Once the nature and characteristics of foreign remittances are better known, we will study their interaction with Pakistan's exchange rate, tradable and non-tradable sectors, and labour market participation. The two sets of analyses together give us an idea of the role remittances have played in the country's evolving trade and export competitiveness. The exchange rate impact is studied using both the annual and monthly data, while the labour supply effects are examined using household survey data. We also investigate the welfare impacts of remittances by analyzing their impacts on inequality and magnitude, depth and severity of

poverty in the country. Wherever possible, we have attempted to disaggregate the remittance flows with respect to their source countries in order to obtain a more thorough understanding of the phenomenon.

As a result of these analyses, a clearer picture will emerge of the potential of migrant remittances as a tool for the country's development. We will therefore be able to discern whether remittances to Pakistan represent “privatized foreign aid” as termed by Adelman (2003) and continuous IMF bailouts with no strings attached, as coined by Agunias (2006), or whether they are a kind of “disease from which the country suffers (Julca 2007, cited in Grabel 2008). Consequently, we can suggest some ways in which remittances can be leveraged for development whilst avoiding the pitfalls they present.

1.5 SCOPE

The body of literature on migration and remittances is large and spans through various disciplines, from economics to sociology to anthropology. In this work, we limit the focus of discussion to the economic aspects of remittances. Topics such as brain drain/gain, the Diaspora's role in the development of the home and host economies’ human and physical capital, etc therefore are not investigated.

We explore both the macro and microeconomic aspects of migrant remittances. The micro-analysis is based on a binary foreign remittances variable, taking the value of one if the migrant household reports receiving money from abroad. Recent household economic surveys also contain some variables on the amounts the households receive and the methods of remittances used (PSLM 2007-8). However, the number of observations is very limited, implying that a representative economic analysis cannot be carried out with these variables (see Irfan 2011 on the possible non-representativeness of the amounts received by migrant households).

On the macro-level, we limit our focus to formal (also called official or officially-received) remittances. Though estimates of informal remittances vary, they are known to form a substantial share of the total remittances of developing countries such as Pakistan (World Bank 2006). The study of these remittances is beyond the scope of this thesis. Consequently,

we use the official remittances data provided by State Bank of Pakistan and the World Bank Balance of Payment statistics. These remittance data can suffer from classification problems, as money from exports/imports under/over-invoicing or other illegal activities can be brought back in the form of remittances⁴. This study generally does not go into data collection issues, and takes the data at face value, limiting its focus to the economic causes and consequences of these remittances.

Furthermore, the macro-analysis of remittances' impact on competitiveness considers the Dutch disease effects, but does not delve into exchange rate competitiveness and possible misalignment effects of remittances. The topic of Pakistan's equilibrium exchange rate and its determinants has already been examined in several studies (see for example Ahmed 2009, Hussain 2008, and Rehman et al. 2010 for recent analyses of Pakistan's real exchange rate misalignment).

1.6 THESIS OUTLINES

The thesis consists of five chapters. The three empirical analysis chapters (Chapter 2 - 4) can stand alone, each investigating a different area of research. The second chapter deals with the nature and causes of remittances, while the third and fourth focus on some of their economic consequences. The introductory and concluding chapters (Chapter 1 and 5) provide the context for respectively the empirical work in general and suggest some common conclusions. The thesis, as a result, can also be read as a collection of loosely-knit pieces.

Chapter 1 introduces the phenomenon under study, explains the objectives, scope and organization of the analysis. The chapter ends with a brief introduction to the Pakistani economy and the remittances.

After providing a brief overview, Chapter 2 presents the analysis of the volatility and micro- as well as macroeconomic determinants of remittance flows to Pakistan. Chapter 3 analyses two ways in which foreign remittances influence Pakistan's trade competitiveness, first studying the so-called Dutch Disease, and then the remittances' interaction with the country's

⁴ For a detailed discussion on problems with remittances and migration data, see Black and Skeldon (2009).

labour market. Chapter 4 examines the association between remittances and household poverty and inequality. Different poverty and inequality measures are drawn, and their relationship with the probability of receiving remittances estimated. The macroeconomic impacts of aggregate and region-wise amounts of remittances are also evaluated. Chapter 5 sums up the discussion and considers some policy implications.

1.7 STARTING DEFINITIONS

Before getting into the nitty-gritty of our analysis, let us define the key concepts examined. We use the terms remittances, foreign remittances, migrant remittances and formal remittances interchangeably in this work, and refer to the private monetary transfers received by households from persons who live abroad (including family members, friends and neighbours). Following World Bank, we define remittances as "the sum of workers' remittances, compensation of employees, and migrants' transfers" (World Bank 2011a)⁵.

We define a migrant as a person who is a former member of a Pakistani household, living outside Pakistan. We employ the terms overseas Pakistanis, migrant community and Diaspora loosely when making reference to the stock of migrants of Pakistani origin.

⁵ Chami et al. (2008) argue that only the first of these three items should be considered remittances.

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CHAPTER 2: REMITTANCES TO PAKISTAN: NATURE AND CHARACTERISTICS

2.1 OVERVIEW⁶

Extant literature on remittances can be divided into two distinct currents. One aims at examining the nature of remittances. Main questions studied include: what are the motives for which migrants send money? what are the economic, demographic and geographical factors on macro and micro level influencing remittances? Are remittance flows stable? If so, to what extent? The other current concerns with the study of macro and microeconomic impacts of remittances on the monetary and financial systems and labour markets, as well as their interaction with income and consumption. The two currents of research are closely linked as the first helps us understand the second. Study of the nature of remittances is therefore essential in order to determine the adequate policy response and maximize their favourable effects on the economy.

In this chapter, we empirically examine some of the questions related to the nature of remittance flows to Pakistan. First, we investigate the stability or otherwise of aggregate and region-wise remittances. In the subsequent sections, we study the individual, household, geographical and macroeconomic factors that determine the incidence and level of remittances to Pakistan.

⁶ version of section 2 was published as Mughal, M.Y. and Makhoul, F., (2011) "Volatility of Remittances to Pakistan: What do the Data Tell?", Economics Bulletin, Vol. 31 no.1 pp. 605-612.

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A version of section 3 was published as Anwar, A. and Mughal, M. (2012). Motives to remit: some microeconomic evidence from Pakistan, Economics Bulletin, AccessEcon, vol. 32(1), pages 574-585.

We thank the anonymous referees of the journal for their useful suggestions on the earlier drafts.

2.2 VOLATILITY OF REMITTANCE FLOWS

2.2.1 Introduction

Formal remittances to developing countries have boomed in the recent times, overtaking other financial flows and becoming the economic lifeline of many developing countries. Pakistan is one of them, being among the top ten remittance receiving countries. Remittances, the country's highest foreign financial inflow, hold great importance for the country, and sharp variations in remittance receipts can be a worry to the country's policymakers.

Remittances are generally presented in the literature as a stable source of foreign exchange flows, much less responsive to business cycles and economic shocks than the FDI and foreign portfolios (see for example Bugamelli and Paterno, 2009; Chami, Hakura and Montiel, 2009; Ratha and Mohapatra, 2007; Ratha 2003). Remittances to developing countries declined by 6% during the 2009 Global recession. At the same time, foreign investment inflows fell by a substantial 30% (World Bank 2011). Being unrequited transfers, remittances are generally not withdrawn from the home country, which can prove helpful during periods of high volatility. This stability can help an economy avoid sharp swings and their consequent effects on the monetary and fiscal policies as well as on public welfare (Gabel, 2008).

The volatility of remittances is contingent upon various macroeconomic factors, including the output fluctuations in the home and host countries, the bilateral exchange rate and the over all socioeconomic conditions of the home and host countries (particularly inflation, unemployment and socio-political stability). It can determine the consumption patterns and saving propensity of the remittance receiving households, thereby impacting the national output, both in the immediate and in the long run.

To what extent this is true needs to be empirically determined. The question is of substantial import to Pakistan, as the government is seeking higher remittances under the Pakistan Remittance Initiative (PRI). This study is an attempt at analyzing this aspect of remittance inflows. We examine monthly remittance flows to Pakistan from July 1972 to December 2011, and therefore, the whole period of the country's history in which foreign remittances played any significant role in the economy. We consider remittances from the three major

remittance sending regions, namely North America, the Middle East and Europe⁷. The economies of these three regions differ substantially, and disaggregating remittances can thence help discern the differentiated impact of remittances. Persian Gulf, from where half of Pakistani remittances originate, is a mainly oil and gas exporting region, and has therefore a very different business cycle as compared to Pakistan's. Crude oil constitutes the biggest single import item of the latter. Like Pakistan, North America and Europe are net energy importers, as well as being Pakistan's main trade partners. As a result, Pakistan's economy reacts to changes in the economies of these regions. However, the Pakistani migrant community in the two regions differs in its economic and demographic profile, and as a result, exhibits dissimilar remitting patterns (more on it below). We look into the extent of stability of formal money transfers by these Diasporas, and examine the possible causes of the resulting volatility. In the end, we examine the challenges and opportunities this volatility presents. We study the volatility of aggregate and region-wise remittances to Pakistan using the ARCH and GARCH models presented in subsection 2 along with the data. Subsection 3 presents the model's main findings. We discuss some possible explanations of these results. The study ends with some conclusions and policy recommendations.

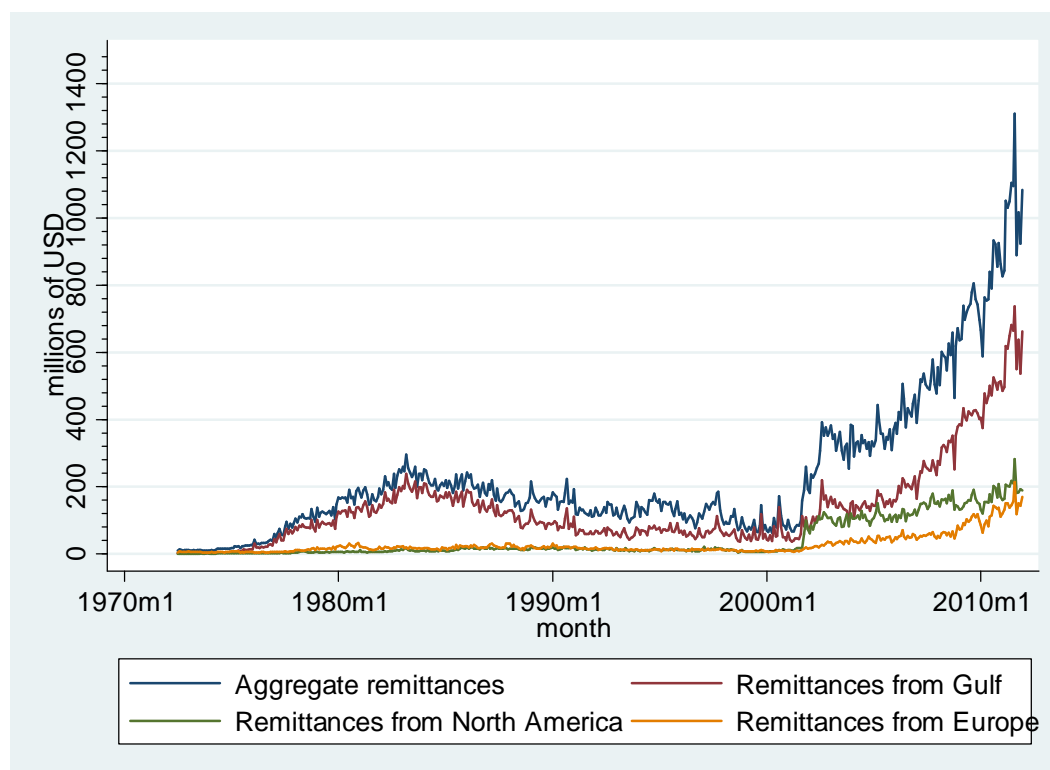
2.2.2 Methodology and data description

Remittances, whether meant for helping the family members, investment or philanthropic causes, react to the economic and social changes occurring in the home and host economies. These can be in response to shocks which can be natural (earthquakes, floods), economic (foreign exchange, balance of payment or debt crisis), or political (instability, war etc). In the last four decades, Pakistan suffered from several natural catastrophies. Notable of these are the consequence of the deadly earthquake in October 2005, and the great floods of 2010 which submerged about 200, 000 sq. km. of the country. In the wake of these disasters, remittances to the country rose to contribute in the rehabilitation of the affected households.

⁷ These regions account for over 90% of the over 7 million Pakistanis overseas and a similar proportion of remittance receipts. Moreover, the three regions together account for the bulk of Pakistan's foreign trade.

The flow of formal remittance inflows also jumped in the immediate aftermath of the tragic events of Sep 11 2001.⁸

Figure 2.2.1: Growth in remittances by region



Source: State Bank of Pakistan and authors' calculations

This behaviour of remittances means that their variations vary with time, and should thus be clustered in small and large groups. Periods of high volatility are followed by periods of relative calm. We examine this volatility of the variance of remittances using the Autoregressive Conditional Heteroskedastic (ARCH) family of models, first proposed by Engle (1982). ARCH and GARCH models are especially suited for the analysis of volatility of economic variables (Engle, 2001). A model is an Autoregressive Conditional Heteroskedasticity (ARCH) model if its error variance is related to the squared error in the previous term. Bollerslev (1986) generalized the ARCH model by allowing the variance to evolve over time. As a result, the Generalized Autoregressive Conditional Heteroskedasticity

⁸ Formal remittances from the US more than doubled in the financial year 2001-02. This sharp rise was probably due to the increased scrutiny of money transfers from the US and curbs on informal remittance channels.

(GARCH) model is able to estimate the time-dependent volatility found in many economic time series as a function of observed prior volatility. Due to this ability to capture the persistence of volatility, model parsimony and ease of computation, the GARCH model has become the workhorse of empirical studies on volatility⁹.

In this study, we use the first-order GARCH(1, 1) model. For that, however, we first need to check for the non-stationarity and non-linearity of the series under examination.

Remittance inflows to Pakistan, just like many other economic time series, show non-stationarity in levels, but are stationary in their first differences. The differenced logarithmic series expectedly show higher variability, indicating that variance must be changing with time. Moreover, for all the time series studied, the value of kurtosis is higher than 3, implying that the normality assumption has to be rejected, and therefore, ARCH effects should be present. The presence of ARCH effects can be confirmed by using Engle's LM test. The P-values for all the series examined are below 0.05 (all with a P-value zero to at least three decimal places), implying that the null hypothesis of no ARCH effects must be rejected (tests shown in Appendix A).

Data for remittances are taken from the State Bank of Pakistan and span from July 1972 to December 2011. Therefore our dataset is composed of 474 monthly observations for the aggregate as well as regional remittance series. Regional series are constructed by grouping country-wise remittances with respect to three geographical regions: North America (consisting of Canada and the US), the Middle East (consisting of the six Gulf Cooperation Council (GCC) countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) and Europe (consisting of UK, Germany, Norway, Switzerland, France, the Netherlands, Spain, Italy, Greece, Sweden, Denmark, Ireland and Belgium).

Summary statistics (shown in Table 2.2.1) indicate that remittances from Europe have remained in a smaller range (\$3.9m to \$213m), while those from the other two regions have varied from \$0.7m and \$2 to \$282m and \$738m for North America and Gulf respectively. This gives an initial idea of the pattern of variation in the remittance flows.

⁹ For an introduction to ARCH family of models, see for instance Enders (2004, Stock and Watson (2007) and Wooldridge (2009).

Table 2.2.1. Summary statistics

VARIABLES	N	Mean	Sd	min	max
remittances_aggregate	474	232.0	222.4	9.470	1,310
north_america	474	42.09	58.15	0.710	282.5
Gulf	474	135.4	127.5	2.070	738.6
Europe	474	27.50	30.89	3.910	213.6
saudi_arabia	474	64.72	52.41	0.500	309.8
u_a_e_	474	38.11	52.17	0	294.5
Bahrain	474	4.609	3.814	0.140	18.61
Kuwait	474	13.00	11.88	0	61.90
Qatar	474	6.074	7.870	0.130	34.02
Oman	474	8.865	6.869	0.700	36.41
Usa	474	39.89	54.89	0.580	263.6
Canada	474	2.197	3.707	0.130	33.75
u_k_	474	19.97	22.83	3	163.9
Germany	474	3.109	2.367	0.080	16.17
Norway	474	1.245	0.849	0.020	5.040
Switzerland	474	0.586	1.043	0	7.540
France	474	0.379	0.819	0	5.970
Netherland	474	0.228	0.357	0	2.700
Spain	474	0.393	1.086	0	6.370
Italy	474	0.410	1.009	0	5.560
Greece	474	0.107	0.273	0	1.340
Sweden	474	0.106	0.209	0	1.150
Denmark	474	0.520	0.557	0	3.040
Ireland	474	0.340	1.040	0	7.640
Belgium	474	0.116	0.214	0	1.400

In the next subsection, we take a closer look at the patterns of volatility using GARCH(1, 1) model.

2.2.3 Results and discussion

Results (given in table 2.2.2) indicate that remittances to Pakistan exhibit low volatility. The ARCH coefficient for Pakistan's aggregate remittances is 0.27 (significant at 1% level), while the volatility persistence coefficient is a moderate 0.38. In other words, remittances to Pakistan do not vary widely as a result of exogenous shocks. This may partly have to do with the diverse nature of host economies (more on it later).

Table 2.2.2. ARCH and GARCH effects for aggregate and region-wise remittances (July 1972 – Dec 2011)

VARIABLES	lnrem	lngulf	lnnorth	lneurope
L.arch	0.279*** (0.078)	0.364*** (0.080)	0.307*** (0.084)	0.228*** (0.070)
L.garch	0.388*** (0.085)	0.387*** (0.082)	0.132 (0.111)	0.024 (0.209)
Constant	0.008*** (0.001)	0.010*** (0.001)	0.024*** (0.003)	0.026*** (0.007)
Observations	473	473	473	473

Standard errors in parentheses

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

Among the three regions studied, remittances from the Middle East exhibit the highest volatility, both in ARCH and GARCH terms (ARCH and GARCH coefficients being 0.36 and 0.38 respectively). This difference in the behaviour of remittances from the Gulf countries could mainly be attributed to two factors:

The nature of host economies: In contrast to the economies of the other two regions, the economies of Gulf countries mostly rely on the production of natural resources (mainly oil and natural gas). Hence, oil prices, which have been highly volatile in the past, are probably related to the boom or bust in these countries. Higher oil prices ultimately lead to higher

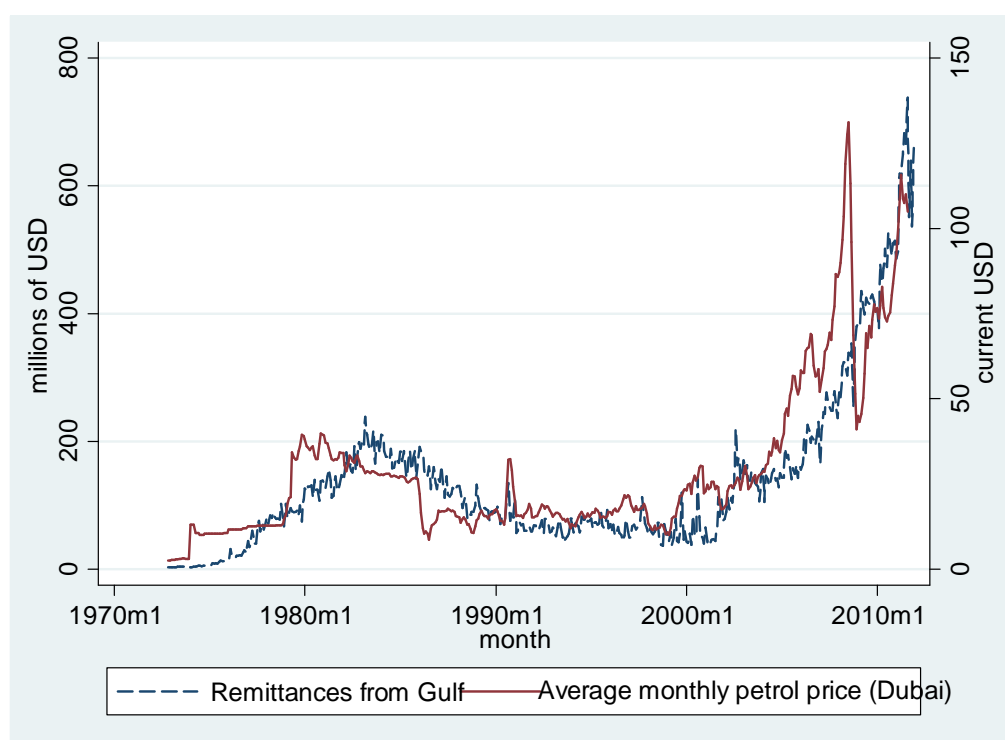
labour demand, which attracts low-cost labour from abroad, including from the neighbouring Pakistan.

The nature of migration: Migration from Pakistan to the Gulf countries is mostly of temporary nature, as given the volatile nature of growth, the governments of these countries promote only transient labour influx. Much of the Pakistani labour force in the Gulf comprises of semi or unskilled workers who come on short term, often non-renewable work contracts and work in construction, services and other booming sectors (Gilani 2008). They often come from poor, rural backgrounds and save a high proportion of their salaries, sending their savings back home with little delay, as their remittances serve as the mainstay of their families.

As a result, higher oil prices should contribute to higher remittance transfers to Pakistan (as seen in figure 2.2.2)¹⁰.

¹⁰ The monthly prices for a barrel of Brent crude oil are taken from the website of l'Institut national de la statistique et des études économiques (Insee) France, available at: <http://www.insee.fr/en/bases-de-donnees/bsweb/serie.asp?idbank=001565198>. The series spans from January 1990 to December 2011.

Figure 2.2.2. Remittances from Gulf and price of oil (January 1990 – December 2011)



Source : INSEE and author's calculations

The more volatile nature of remittances from the Gulf Cooperation Council (GCC) countries is also evident from the country-wise results (table 2.2.3). Four out of six countries of the region exhibit volatility coefficient in excess of 0.35, while five out of six have a GARCH coefficient above 0.30 reaching as high as 0.58 for Kuwait. One positive finding here is that remittance inflows from Saudi Arabia are comparatively less volatile (ARCH coefficient being 0.21 and GARCH coefficient of 0.39). Given that the country accounts for over a quarter of Pakistan's total foreign remittances, this implies a relatively stable source of foreign exchange for Pakistan.

Chapter 2: Remittances to PAKISTAN: nature and characteristics

Table 2.2.3. ARCH and GARCH effects for remittances from Gulf states (July 1972 – December 2011)

VARIABLES	lnsaudi	Lnu_a_e	lnkuwait	lnbahrain	lnqatar	lnoman
L.arch	0.216*** (0.067)	0.373*** (0.078)	0.456*** (0.058)	0.360*** (0.067)	0.292*** (0.091)	0.379*** (0.069)
L.garch	0.392*** (0.134)	0.225** (0.095)	0.584*** (0.034)	0.376*** (0.075)	0.316** (0.133)	0.547*** (0.056)
Constant	0.014*** (0.003)	0.034*** (0.005)	0.004*** (0.001)	0.024*** (0.004)	0.029*** (0.006)	0.006*** (0.002)
Observations	473	449	470	473	473	473

Standard errors in
parentheses

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

Table 2.2.4. ARCH and GARCH effects for remittances from North America and Europe (July 1972 – December 2011)

VARIABLES	lnusa	lncanada	lnu_k	lngermany	lnnorway	lnswitzerland
L.arch	0.309*** (0.081)	0.365*** (0.077)	0.282*** (0.066)	0.278*** (0.073)	0.223*** (0.061)	0.894*** (0.158)
L.garch	0.153 (0.114)	0.207** (0.086)	0.032 (0.177)	0.362** (0.147)	0.407*** (0.076)	-0.002 (0.084)
Constant	0.025*** (0.003)	0.033*** (0.005)	0.036*** (0.008)	0.024*** (0.008)	0.036*** (0.005)	0.169*** (0.024)
Observations	473	473	473	473	473	185

Standard errors in
parentheses

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

In contrast to remittances from Gulf, those from Europe exhibit low volatility (ARCH coefficient of 0.22 and an insignificant coefficient for GARCH). This low volatility can also be seen in the remittances from the United Kingdom, which form the bulk of remittances from the region (table 2.2.4). An explanation for this behaviour may lie in the nature of migration to the region, particularly to the United Kingdom. Pakistani migrants to the region are mainly permanent immigrants to UK (typically settled in the country for several decades), who often send money home to assist the extended families. Such financial support is usually steady, that waxes in the hour of need but falls back to its historic trend once the economic shock has been absorbed. The European Pakistani community is a mix of professional and low-skilled immigrants, which apparently does not have an investor profile. This can not be said for the North American migrant community however. This Diaspora, like the one in Europe, comprises of permanent migrants, but mostly consists of highly educated individuals, including doctors, engineers, programmers etc.¹¹ The comparatively higher volatility of their remittances (table 2.2.2, 2.2.4) may be due to different remitting behaviour associated with the host or home country's economic progress. This can be seen in the way remittances from North America are associated with home and host country output. Remittances from Canada and the United States show a high correlation of 0.88 and 0.85 with host country's GDP. Their correlation with Pakistan's GDP is even higher at 0.92.

This points to the investor profile of the Pakistanis in North America. Being the most qualified and the highest earning group among the country's overseas communities, North American Pakistanis are best placed to take advantage of the new investment opportunities in their country of origin. Therefore, they send more money in periods of high growth. Anecdotal evidence suggests high proportions of remittances from North America going into real estate, construction and stock market boom during the high growth period from 2003 to 2006.

The correlation of remittances with official exchange rate also point in the same direction, as the North American remittances appear to be the ones most strongly associated with

¹¹ The 2005 American Community Survey undertaken by the US Census Bureau shows that among the male Pakistani population aged 25 years and over, 60.9% had bachelor's degrees or higher while the American average for the same category was 28.5% (Oda, 2009). In contrast, tertiary enrolment rate in Pakistan is hardly 5 percent.

exchange rate fluctuations (more on the relationship between aggregate and region-wise remittances, and Pakistan's real exchange rate in the next chapter).

On the other hand, remittances from Europe are less correlated with either the regional or the Pakistani annual output. These remittances appear to be more or less altruist, sent regardless of the level of growth in the host or the home country.

A related explanation for this divergent behaviour of remittances may be the more volatile nature of economic growth of the US and Canada as compared to the anaemic growth rates prevalent in Europe during the studied period. The rise in the share of remittances from North America in the aftermath of the 9 11 attacks may also have affected the over all volatility of remittance flows. Table 2.2.5 shows that North American remittances have a very high ARCH coefficient of 0.84 in the post-Sep 2011 period as compared to 0.37 before it, and a low insignificant persistence coefficient as compared to a significant one before.

Table 2.2.5. ARCH and GARCH effects for remittances – before and since 11 Sep 2001

Before 11 September 2001					
VARIABLES	Remittances_aggregate	gulf	north_america	europa	usa
L.arch	0.236*** (0.086)	0.121*** (0.036)	0.377*** (0.109)	0.258*** (0.087)	0.374*** (0.105)
L.garch	0.493*** (0.120)	0.805*** (0.068)	0.267* (0.140)	-0.085 (0.190)	0.230* (0.133)
Constant	0.007*** (0.002)	0.003* (0.001)	0.017*** (0.004)	0.030*** (0.007)	0.020*** (0.005)
Observations	349	349	349	349	349
Since 11 September 2001					
L.arch	0.300** (0.152)	0.442** (0.172)	0.848*** (0.136)		0.801*** (0.137)
L.garch	0.170 (0.219)	0.203 (0.146)	0.040 (0.157)		0.111 (0.187)
Constant	0.009** (0.003)	0.008*** (0.002)	0.014** (0.006)		0.012* (0.006)
Observations	123	123	123		123
Standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Table 2.2.5 also shows that both the total and Gulf remittances have a higher ARCH and a lower GARCH coefficient since September 2001. the ARCH coefficient for over all remittances, for instance, has gone from 0.23 to 0.30, which nevertheless remains moderate. Here, it needs to be mentioned that FDI-related capital flows to Pakistan have a ARCH

coefficient of 0.22 in the post-Sep 2001 period (results not shown), comparable to the one for remittances before that period but lower than the one in the post-Sep 2001 era¹².

En passant, it can be noted that the relatively low volatility of the over all Pakistani remittances is thanks to this diversity of economic conditions in which the overseas Pakistanis find themselves. While the high oil price driven remittances from the Gulf states help the country cope with the deterioration in current balance caused due to rising oil import bill and lower remittances from North America, the remittances from Europe remain steady and keep the over all volatility in check.

2.2.4 Concluding remarks

So what message does this study bring ? One good news is that the remittances to Pakistan are relatively stable. This, as the analysis showed, is mainly due to the diverse economic conditions of the sending countries and the varied socioeconomic profile of the Pakistani Diaspora. An across the board increase in remittance flows under the PRI should therefore not worry the country's economic managers on this account. Remittances from the United Kingdom and other Western European countries have shown little volatility so far, and additional receipts from the region should in fact improve the country's economic stability. So the government can indeed rely on remittances as a stable source of foreign exchange inflow. The country can benefit from this stable nature of remittances by securitizing them and thereby improving its sovereign credit rating (more on it in the concluding chapter). Rising remittances may continue their salutary impact on the inequality and poverty in the country (chapter 4), but could pose the economic managers additional difficulty on the macroeconomic front by exasperating the Dutch disease from which the country's economy already suffers (chapter 3). However, more research is needed on the macro and microeconomic determinants of remittances in order to establish the main motivation of the Pakistani migrants behind such different patterns of remittance flows analyzed in this section, a task we take up in the next two sections. To sum up, given some deft handling, remittances should continue playing a positive role in Pakistan's economic progress.

¹² The monthly series for FDI inflows begins only in 2000, so a comparable pre-9 11 volatility estimation can not be carried out.

2.3 MICROECONOMIC DETERMINANTS¹³

2.3.1 Introduction

Remittances, the portion of income that international migrants send back home, are playing an increasingly important role in the developing countries. In some small developing countries such as Tajikistan, Tonga and Moldova, remittances make up as high as a third to half of the national output (World Bank, 2011). The volume of remittance transfers to many developing countries exceeds that of foreign private capital and official development assistance combined. Pakistan is one such country. In the last three decades, officially recorded remittances to the country made up close to 5 percent of the GDP as compared to 2.2 percent for the ODA and 1 percent for the FDI.

Remittances are considered much less responsive to business cycles and economic shocks than FDI and foreign portfolios (see for example Bugamelli and Paterno, 2009; Ratha and Mohapatra, 2007). The impact of remittances on economic growth is also often found to be higher than that of Foreign Direct Investments and Official Development Assistance. Given such significance, it is important to study the motives behind these remittances, and the economic impact they entail.

Extant literature proposes five major motives for remitting: altruism, risk insurance, loan repayment, exchange and inheritance (Rapoport and Docquier, 2006). These motives range from purely altruistic to purely self-interested. Those in between the two extremes can be termed as “tempered altruism” or “enlightened selfishness” (Andreoni, 1989; Lucas and Stark 1985). In the presence of altruistic motives, a migrant sends money back home to financially support his family (Johnson and Whitelaw, 1974; Lucas and Stark, 1985). Such remittances are therefore higher in the case where the receiving household is poor, and go down as the household income rises. Poor households diversify their income sources by sending their members abroad. This serves to reduce risks to family income and acts as insurance against local economic shocks (Stark, 1991; Gubert, 2002).

¹³ A version of this section was published as “Motives to remit: Some microeconomic evidence from Pakistan”, *Economics Bulletin*, AccessEcon vol. 32(1), pp. 574-585.

Remittances can also be considered the result of implicit contract between the members of a household. Households invest in the education and cost of the migration process. The migrant sends remittances to the family to repay this implicit and informal loan (Johnson and Whitelaw, 1974; Lucas and Stark, 1985; Stark and Lucas, 1988; Ilahi and Jafarey, 1999). The money sent by the migrant can also be due to the exchange motive. The family back home takes care of the migrant's children, physical assets and other financial and social interests, and receives remittances as payment for these services (Cox, 1987; Cox, Eser and Jimenez 1998). Finally, remittances can be sent with the desire to inherit. The migrant aspiring for a share in inheritance sends money in order to maintain good relations with the family members back home.

These motives have been widely studied for different countries using both macro and microeconomic data. On the microeconomic level, factors such as migrant and family income, household size, age and sex of the head of the household, family wealth and level of education have been found to be important indicators of these motives.

In the context of Pakistan, previous studies have shown a muddled picture. For instance, Nishat and Bilgrami (1993) found migrants' earnings, household size and income to be important factors behind the likelihood of remitting money, while Pasha and Altaf (1987) found investment motive to be influential in the migrants' decision to remit. Ilahi and Jafarey (1999), using the ILO-ARTEP (1987) survey data found that informal loan repayment was important in the case of returning Pakistani migrants.

Pakistani migrant community, whose numbers range from 3.5 million (United Nations, 2009) to 7 million (Government of Pakistan, 2010), is highly diverse in level of education and income, and is spread around the world. The Arab states of Persian Gulf host about half of the worldwide Pakistani diaspora, whereas North America and Europe share the remaining half. At the time of the above mentioned studies, the source of Pakistan's remittances was overwhelmingly the Persian Gulf states, where most Pakistani migrants are temporary workers. This has changed in recent years, with the rise in importance of the North American remittance corridor. Pakistani migrants in the U.S and Canada, in contrast, are often permanent migrants (Najam, 2006), and may thus have different remittance motives than those from the Middle East. Temporary migrants are found in the literature to often remit for

investment purposes while the permanent migrants tend to show more altruistic behaviour (Glystos 1997).

Furthermore, in recent times, remittances to Pakistan have been associated both with poverty reduction and more costly real estate and stocks. Therefore, both altruistic and investment motives may be at play. The aim of this study is to investigate the motive that may be dominant in Pakistan. We employ two recent household economic surveys carried out in 2005-06 and 2007-08. With these representative datasets, we study the recipient side determinants of remittances, and assess the motivation behind their incidence. The study is organized as follows. Subsection 2 presents the model and the theoretical underpinnings behind the variables included. Subsection 3 gives some key findings and looks at possible explanations, followed by concluding remarks.

2.3.2 Data description and empirical strategy

Pakistan Social and Living Standards Measurement Surveys (PSLMs) are carried out every two or three years in order to obtain representative household socioeconomic data on household level. The 2005-06 and 2007-08 PSLM surveys used in this study consist of 15453 and 15512 households respectively.

In this study, we examine various economic, demographic and geographical factors observed in the surveys that affect the likelihood to remit. These variables correspond to one or more motives to remit. Household income, for instance, can be a clear indicator of altruistic motive as opposed to the investment motive. Low-income households are more likely to receive remittances, given higher unmet basic needs (Funkhouser, 1995). This negative relationship can also occur in the presence of implicit intra-familial contracts insuring the household against adverse economic conditions. A positive relationship will however correspond to either bequest or investment motive. Similarly, there may be a negative relationship between family wealth and remittance incidence in the presence of an altruistic motive. Migrants from poorer households may feel morality or custom bound to help their families and those from richer households may not find much need for their participation. However, migrants from wealthier households may instead remit for bequest, investment or exchange motives, which may imply a positive correlation with family wealth. Share in inheritance may be a strong motivation for remitting if the household is wealthy (De la Briere 1997; Cox et al. 1998;

Lucas and Stark 1985). Likewise, the probability of receiving remittances could increase if the migrant intends to return permanently, as in this case, he transfers his savings back home to buy land or property. The aforementioned three motives could dominate the altruistic motivation to remit. Consequently, the correlation of income and wealth with remittances may diverge depending on the socioeconomic circumstances of the migrants.

The level of education of the household is another factor determining remittances (Amuedo-Dorantes and Pozo, 2006). Incidence of remitting is positively correlated with education level if remittance is seen as return to household's investment on education. Household spending on education therefore takes place as an informal loan agreement (Johnson and Whitelaw, 1974; Lucas and Stark, 1985), and the educated migrant remits to repay the implicit loan incurred. However, the education - remittance incidence correlation can be negative if the migration is of a permanent nature (Faini, 2007). If the migrant intends to settle abroad, he will be more likely to spend and invest his savings in the adopted country.

This effect is also evident in the presence of a spouse or children back home. If the head of the household is female, it may imply higher probability of receiving remittances. Whether the female is the migrant's spouse or mother, pure altruistic motive may come into play. Similarly, higher number of family members or more dependants at home may be related to higher likelihood of remittances (Banerjee 1984; Merkle and Zimmermann 1992), regardless of whether the motive be altruistic or co-insurance. In the former case, it may reflect concern for high family needs, whereas in the latter case, remittances may be the payment for a Pareto superior strategy of co-insurance by sending some household members abroad.

Table 2.3.1. Empirical effects found for probability to remit

Effect of ... on probability of remittances	Hhold income	Hhold wealth	No. Hhold members/ dep. ratio	Age Hhold Head	Education Hhold Head
Agarwal & Horowitz (2002) Guyana, Altruism model	-	-	-	X	X
Banerjee (1984) India			+		
Durand, Kandel, Parrado, Massey (1996) Mexico, [Remittances & savings]		-(1)	X		
Germenji, Beka & Sarris (2001) Albania	-	X	X	X	X
Hoddinott (1994) Western Kenya		+	X		+
Holst & Schrooten (2006) Migrants in Germany		_(2)	X		
Itzigsohn (1995) Jamaica, Haiti, Dominican Republic & Guatemala	/+/- X (3)		+	x	+/- X(3)
Osaki (2003) Thailand, [internal migration]	-	-	-(4)		
Chavez (2004) El Salvador	-	+		X	
Schrieder & Knerr (2000) Cameroon		+(5)/ -(6)		+	

The explanation to the above table is:

- +: positive effect
- : negative effect
- X: included in regression but not significant
- 1: business owned
- 2: real estate owned
- 3: depends on country
- 4: no. children
- 5: property
- 6: other wealth variables

Source: adopted from Zanker and Siegel (2007)

The signs found in the literature for the above mentioned variables are given in table 2.3.1. In addition to these demographic and economic indicators, we add two geographical variables, pertaining to the household's location. The province variable describes which of the four provinces of Pakistan (Punjab, Sindh, Khyber Pakhtunkhwa (KP) and Balochistan) in which the household lives. Most of the country's migrants come from Punjab. Hence, a higher remittance incidence probability can be expected for the province. However, the more rural and less developed provinces of KP and Balochistan may also expect higher remittance likelihood for altruistic motives. Similarly, the type of migration from Pakistan differs depending on whether the household location is rural or urban. Therefore, a proxy for rural/urban setting is also included in the model.

The empirical model estimated in the present study is expressed as follows:

$$\text{Remittances} = \alpha + \beta_1 \text{HHsize} + \beta_2 \text{femalehead} + \beta_3 \text{agehead} + \beta_4 \text{wealth} \\ + \beta_5 \ln \text{Income} + \beta_6 \text{enrollmentStatus} + \beta_7 \text{province} + \beta_8 \text{region} + \mu_i$$

Table 2.3.2 gives the definitions of these variables used in our model, where their summary statistics are described in table 2.3.3. All the variables in the model pertain to the household back home, given that no migrant-related variable exists in the two surveys. Subsequently, potentially important drivers such as migrant's education, marital status, length of stay abroad etc cannot be examined in this study.

Both household income and savings are taken in logarithmic form, and zero values have been replaced with one for both variables to allow logarithmic transformation.

Besides, we alternately replace our demographic indicators (household size and female household head) by number of dependents and number of male adults respectively.

We alternately use the monetary value of household savings, home, commercial property and agricultural land ownership as indicators of the household wealth. The PSLM datasets also contain other potential wealth indicators such as car ownership, livestock etc. but are not included in the study due to small number of observations for these variables.

Table 2.3.2. Description of the Variables

Variable	Description of the Variable
Forr _i	1 if any member of the household received overseas remittances during last 1 year (money received which will not be repaid) or 0 otherwise
Hhsize _i	number of family members in the household
Femalehead _i	1 if the head of the household is female or 0 otherwise
Dependent _i	number of household members above under 18 and above 65 years
Maleadult _i	number of male household members between 18 and 65 years of age
agehead _i	Age (in complete years) of the household head
lnincome _i	Natural logarithmic of total income (earned in Rs. by household Members through first /second occupation or through pension during the last one year)
lnsaving _i	Natural logarithmic of total savings (total value in Rs. of net savings of the household at present or during the last 1 year. Also the total value in Rs. of gold, silver etc. including jewelry, stones sold during the last 1 year)
Residentialbuilding _i	= 1 if any of the HH members own or had owned a residential building (Completed / under construction) during the last 1 year = 0 otherwise
Commercialbuilding _i	1 if any of the HH members own or had owned a commercial building (Completed / under construction) during the last 1 year = 0 otherwise
Agriculturalland _i	1 if any of the HH members own or had owned agricultural land during the last 1 year or 0 otherwise
Enrollment status _i	= 1 if the HH member has ever enrolled in school = 0 otherwise
Province _i	= 1 if remittance recipient household lives in Punjab
	= 2 if remittance recipient household lives in Sindh
	= 3 if remittance recipient household lives in Khyber Pakhtunkhwa
	= 4 if remittance recipient household lives in Balochistan
Region _i	= 1 if a urban household receives remittances = 0 otherwise
I	household i

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Given the dichotomous nature of dependent variable and the characteristics of the variables selected, all model specifications are estimated using Probit model. All standard errors in our specifications are robust (Eiker-Huber-White Heteroskedastic-Consistent Standard Errors) to control for unobserved heterogeneity. The diagnostic tests for our baseline and alternate models are given in Appendix B. The models clear the tests for goodness of fit, classification and colinearity.

Table 2.3.3. Summary Statistics

a. 2005 dataset

VARIABLES	N	mean	Sd	Min	Max
Hhsize	134.819	8.590	4.654	1	55
Dependent	134.819	4.459	3.212	0	33
Agehead	15.800	46.00	14.02	10	99
Femalehead	134.819	0.010	0.102	0	1
Maleadult	134.819	1.890	1.330	0	11
Forrem	15.442	0.057	0.232	0	1
Inc	131.143	115,915	151,586	0	4.500e+06
Savings	87.461	46,212	178,366	10	2.000e+07
agri_land	100.252	0.128	0.334	0	1
Residentialbuilding	133.557	0.888	0.315	0	1
Enrollmentstatus	100.872	0.545	0.498	0	1
Region	112.995	0.392	0.488	0	1

b. 2007 dataset

VARIABLES	N	Mean	Sd	min	Max
Hhsize	124.835	8.236	4.091	1	37
Dependent	124.835	4.394	2.942	0	26
Agehead	15.978	46.19	13.53	0	99
Femalehead	124.835	0.011	0.109	0	1
Maleadult	124.835	2.074	1.372	0	10
Forrem	8.136	0.043	0.203	0	1
Inc	124.830	142.101	223.774	1	1.022e+07
Savings	93.287	85.070	478.911	0	3.000e+07
Commercialbuilding	21.188	0.022	0.150	0	1
Agrilandownership	15.511	0.089	0.286	0	1
Enrollmentstatus	97.117	0.567	0.495	0	1
Region	108.469	0.391	0.488	0	1

2.3.3 Key findings

Results given in table 2.3.4 show that demographic factors are possibly the most important determinants of remittances to Pakistan. A family with a female head of the household shows a much higher likelihood of receiving remittances as compared to the households headed by a male. This points to the probable presence of a strong altruistic motivation behind money remitted to the country. The positive sign for household size implies the presence of either altruistic or co-insurance motive.

As regards household income, a 1% higher household income is associated with a 15% lower likelihood of receiving money from abroad, *ceteris paribus*. This negative relationship again suggests the presence of altruistic or co-insurance motives.

Table 2.3.4. Determinants of remittance incidence (2005-06 and 2007-08)

VARIABLES	2005	2007
Hhsize	0.050*** (0.005)	0.060*** (0.020)
Femalehead	0.448*** (0.138)	1.517*** (0.242)
Agehead	0.0127*** (0.001)	0.013* (0.007)
enrollmentstatus	0.325*** (0.044)	0.391** (0.190)
Lninc	-0.146*** (0.011)	-0.150*** (0.024)
Region	-0.109** (0.044)	-0.217 (0.181)
Province	0.000 (0.018)	-0.054 (0.081)
Constant	-1.304*** (0.148)	-1.417*** (0.466)
Observations	12,909	984
Robust standard errors in parentheses		

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

Given that most of the Pakistani migrants go abroad to improve their and their households' economic situation, both these motives are likely in action. It is not possible to distinguish between the two in a cross-sectional setting (In a panel study however, the difference can be observed as growing household incomes could lead to fewer altruistic motivated remittances, while those due to co-insurance motive continue unchanged). A similarly strong piece of evidence for altruistic motives is found using other demographic indicators (Table 2.3.5). Replacing household size with number of dependent members at home does not change the

positive sign associated with the altruistic motive. Likewise, the number of male adults seems to be negatively related, as opposed to female headship, indicating an altruistic motive.

Another possible manifestation of the altruistic motive is the positive sign for the age of household head (table 2.3.4). Older heads of the households have a slightly higher probability of receiving remittances, which may be due to migrant's concern for the family head's health or work capacity. The age of the female head of household, however, does not appear to have any effect on the incidence of remittance (results not shown). The migrant may feel it necessary to remit regardless of whether the household head is his spouse or mother. This observation points to the fact that in the absence of male migrant workers (who are commonly the primary bread winners of the family), Pakistani women often must carry out household responsibilities, and receive remittances to sustain the family expenses.

Table 2.3.5. Determinants of remittances with other demographic indicators

VARIABLES	2005		2007	
Hhsize		0.050*** (0.005)		0.093*** (0.024)
Femalehead	0.411*** (0.133)		1.504*** (0.244)	
Agehead	0.014*** (0.001)	0.012*** (0.001)	0.014** (0.006)	0.015** (0.007)
Enrollmentstatus	0.334*** (0.044)	0.321*** (0.044)	0.384** (0.190)	0.265 (0.181)
Lninc	-0.139*** (0.011)	-0.146*** (0.011)	-0.143*** (0.024)	-0.190*** (0.024)
Region	-0.110** (0.044)	-0.108** (0.044)	-0.191 (0.182)	-0.127 (0.175)
Province	0.013 (0.018)	7.08e-05 (0.018)	-0.048 (0.081)	-0.080 (0.080)
Dependent	0.049*** (0.007)		0.073** (0.029)	
Maleadult		-0.475*** (0.139)		-0.218*** (0.083)
Constant	-1.285*** (0.149)	-0.832*** (0.145)	-1.393*** (0.471)	-0.717 (0.437)
Observations	12,909	12,909	984	984

Robust standard errors in parentheses

We do not include wealth variables in the baseline model, as their presence along with the income variable causes high multicollinearity (the mean variance inflation factor breaches the suggested value of 10). As a result, we test our model alternately adding the wealth indicators and excluding income variable. These wealth indicators, however, tell a different story (table 2.3.6). All the wealth variables (except for home ownership) show a positive, highly

significant and relatively strong relationship with remittance incidence. This suggests the presence of bequest, investment or exchange motives behind some of the remittances. Given the diverse nature of migration from the country, this difference between the behavior of income and wealth variables, and their respective probable motives, is not surprising. Pakistani Diaspora in North America, for instance, is highly educated, prosperous and mostly permanently settled in the adoptive countries (Oda 2009). The motives behind remittances from this community are thus partly investment or bequest related and partly altruistic. The Pakistani American community, for instance, is active in philanthropic endeavors in Pakistan, establishing and running various humanitarian and human development projects (Najam, 2006). At the same time, anecdotal evidence suggests the community's strong participation in Pakistan's real estate and stock market boom of the 2000s. On the other hand, as mentioned earlier, the large Pakistani community in the Persian Gulf mostly comprises temporary workers from a poor, rural background, with varying degrees of qualifications. Money sent by these workers, as a result, may be primarily for altruistic purposes, whether for the household's basic alimentary needs, education or healthcare.

Table 2.3.6. Determinants of foreign remittances with wealth indicators

VARIABLES	2005			2007		
hhsiz	0.034*** (0.005)	0.051*** (0.005)	0.046*** (0.004)	0.012 (0.023)	0.106 (0.068)	0.159** (0.080)
femalehead	1.351*** (0.097)	1.213*** (0.090)	1.233*** (0.078)	1.882*** (0.288)		2.229*** (0.669)
agehead	0.006*** (0.002)	0.008*** (0.001)	0.009*** (0.001)	0.007 (0.008)	0.001 (0.011)	0.010 (0.012)
enrollmentstatus	0.110** (0.054)	0.277*** (0.049)	0.287*** (0.042)	-0.036 (0.210)	-4.404*** (0.585)	0.630 (0.610)
lnsaving	0.218*** (0.019)			0.253*** (0.064)		
region	-0.262*** (0.052)	-0.116** (0.048)	-0.120*** (0.043)	-0.392** (0.190)	0.177 (0.531)	-0.713 (0.496)
province	-0.0005 (0.019)	0.012 (0.020)	0.021 (0.017)	-0.0001 (0.078)	-0.075 (0.229)	
agri_land		0.222*** (0.062)				1.322** (0.618)
commercialbuilding					5.039*** (0.677)	
residentialbuilding			0.058 (0.067)			
Constant	-4.441*** (0.214)	-2.702*** (0.108)	-2.771*** (0.111)	-4.788*** (0.728)	-2.454** (1.004)	-3.420*** (0.909)
Observations	8,203	9,709	12,976	727	155	68

Robust standard errors in
parentheses

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

The strong positive association of the completed education variable supports the implicit loan agreement between the family members. Educated families are often financially well off, and

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Can afford to send their members abroad and subsequently receive foreign remittances. Households with mostly illiterate members often do not possess the knowledge or the financial wherewithal to undertake overseas migration.

The province indicator does not appear to significantly drive the incidence of remittances. Province-wise analysis of determinants (table 2.3.7) shows that Khyber Pakhtunkhwa has a higher probability of receiving remittances as compared to Punjab (taken as baseline). In contrast, both the southern provinces Balochistan and Sind show substantially lower probabilities than Punjab. This indicates that in Pakistan, overseas migration and the money transfers that follow are mostly confined to the households residing in the upper provinces of KPK and Punjab.

Unlike an over all insignificant association with the provincial indicator, the region dummy shows a significant negative relationship with the probability of receiving remittances. This implies that rural areas have a higher probability of receiving remittances from abroad as compared to urban areas. This is in line with the observation that most Pakistani migrants, especially those going to the Gulf countries, come from rural areas.

Table 2.3.7. Determinants of foreign remittances with respect to provinces

VARIABLES	2005	2007
hhsz	0.048*** (0.005)	0.073*** (0.022)
femalehead	0.262* (0.141)	1.717*** (0.271)
agehead	0.012*** (0.001)	0.012* (0.007)
enrollmentstatus	0.318*** (0.047)	0.457** (0.204)
lninc	-0.145*** (0.011)	-0.127*** (0.025)
region	-0.077* (0.046)	-0.233 (0.194)
2.province	-0.697*** (0.077)	0 (0)
3.province	0.405*** (0.048)	0.276 (0.205)
4.province	-0.576*** (0.085)	-0.698** (0.321)
Constant	-1.198*** (0.151)	-1.790*** (0.485)
Observations	12,909	725

Robust standard errors in parentheses

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

The robustness of our findings is reflected in the identical signs and very similar magnitudes and levels of statistical significance across various specifications for both the 2005-06 and 2007-08 datasets. Here, it must be mentioned that remittance incidence in our survey data are

based on both formal and non formal money receipts from abroad. Consequently, our results provide a more complete picture of remittance scenario than the macroeconomic analyses based on officially recorded remittances. Informal means of remittances are widespread in Pakistan, and the amount of money brought through hand carry and Hundi/Hawala constitutes a sizeable proportion of the total remittances (World Bank 2006; ILO-ARTEP 1987). Therefore, our findings may or may not concur with those based on aggregate formal remittance data.

2.3.4 Concluding remarks

In sum, our findings indicate the possibility of a strong altruistic motive behind Pakistan's remittance incidence. This is evident from high remittance probability for demographic and income variables. The weaker likelihood of remitting owing to wealth and education indicates support for implicit interfamilial exchange and loan repayment arrangements. Our findings back the argument of Dustmann and Mestres (2010) that the motivation to remit depends, in part, on the form of migration. As migration from Pakistan is of a temporary as well as a permanent nature, and migrants' destinations are spread across different regions around the world, it is but natural to find evidence for such diverse motives to remit.

Nonetheless, we are unable to distinguish between the altruistic and co-insurance motives on the one hand, and the loan repayment, exchange and investment motives on the other. This is because the inter-temporal aspects of remittance motives cannot be studied, given the cross-sectional nature of the data. A longitudinal study on migration and remittances would help better discern the motives to remit. The temporal aspects of remittance are also important to study as the migrant's degree of attachment to his family and the home country can evolve over time. Moreover, migrant's home and host country economic and social conditions too vary over the period of stay. In addition to the microeconomic motives examined in this section, these macroeconomic variables also factor in the decision about whether and how much to remit. We study these factors in the following section.

2.4 MACROECONOMIC DETERMINANTS

2.4.1 Introduction

Macroeconomic conditions can also influence the migrant's decision to remit. Regardless of whether the motive behind remitting is altruist or self-interested, home and host country economic situation can impact the migrant's decision both whether and how much to remit.

Factors like the home and host country's growth, exchange rate movements, interest rates, inflation and investment are notable in this regard (Russell 1986.

A deterioration in the economic conditions of the migrant's home country may lead him/her to transfer more money to help the family members back home (De la Brière et al., 2002; ElSakka and McNabb, 1999). On the contrary, improving economic conditions can give a migrant more investment opportunities back home, leading to higher remittance flows (Aydas et al. 2004; Glytsos, 1988, 2002; Higgins et al. 2002).

The two reactions to home economic development imply counter and pro-cyclical behaviour of remittances respectively.

Remittance behaviour of the migrant in the face of macroeconomic changes depends on the nature of migration. Temporary migrant may respond more to home country economic conditions. On the other hand, a permanent migrant may earn more with the growing host economy, and may choose to save or invest more in the host economy, implying lower transfers back home (Chami et al. 2005. The degree of integration between the home and host countries also affects the remitting behaviour. If the two grow in analogous fashion, the migrant's home and host savings and investments both improve at the same time. From an altruistic perspective, this may induce a fall in remittances, whereas remittances may register an increase if the migrants have an investor profile.

Empirical research on the question has come up with evidence for differing remittance motives from different remittance-receiving countries. In his study of 76 low and middle-income developing countries, Adams (2009) finds that an inverted u-shaped curve exists between the level of country GDP income and the receipt of remittances. "The level of per capita remittances received by a country increases until a country has a per capita GDP income of about \$2,200 per year, and falls thereafter." Similarly, Chami et al. (2005) examine

a panel of 87 developing countries and conclude that remittances have a negative relationship with the home country GDP and an opposite one with the host country GDP.

Aydas et al. (2004) in case of Turkey, Chamon, Semblat and Morant (2005) in case of Samoa, Glytsos (2002) in case of mediterranean countries, and Quartey and Blankson (2004) in case of Ghana also come up with evidence for procyclical nature of foreign remittances.

In contrast, Agarwal and Horowitz (2002) in the case of Guyana, and Gupta (2005) in case of India find evidence of a negative effect of home country economic activity on the amount of money remitted. Other studies which conclude altruistic relationship between remittances and home country output include De la Brière et al. (2002), El-Sakka and McNabb (1999), Faini (1994), and Karpestam and Andersson (2011).

Exchange rate of the home and host countries can also be an important determinant of remittances. Depreciation of the home currency means that goods and services become relatively less expensive. If the migrant sends money to help the household maintain a certain standard of living, he will now need a lower amount of foreign currency to consume the same bundle of goods and services given the higher purchasing power of the foreign currency. Nevertheless, the migrant may remit more allowing the family members back home to increase their consumption and benefit from an improved purchasing power.

However, if the motive is investment in the local economy, depreciation may cause the migrant to modify his investment plans. A depreciating currency often signals deteriorating economic conditions. This may dissuade an investment-motivated migrant from remitting further. But if the migrant intends to return home, or he feels confident of the long-run prospects of the home economy, a falling domestic currency may also encourage the migrant to remit more to take advantage of cheaper local asset prices.

Studies such as Chami et al. (2005), Chamon et al. (2005), Faini (1994) and Garson (1994) find that remittance flows increase in the aftermath of domestic currency depreciation. However, Hysenbegasi and Pozo (2008), using data for 23 Latin American countries demonstrate that migrants avoid remitting when the exchange rate is under pressure implying that remitters try to reduce their exposure to exchange rate losses by taking into account the expected future value of their transfers.

Yet another macroeconomic factor determining the volume of remittances is inflation in the home and host economies. Higher inflation in the home country relative to host country represents more economic uncertainty in the home country, which may negatively affect the migrants' remittance decision. High inflation may be a cause of political instability or economic mismanagement. Inflation in the home country erodes the purchasing power of the migrant's household, and may lead to an increase in remittances under altruistic motives. Empirical works have generally shown a negative impact of inflation on the amounts remitted (see for instance Aydas et al. 2004, Buch and Kuckulenz 2004, Elbadawi and Rocha 1992, Glytsos 2002, and Katseli and Glytsos 1986).

Literature on macroeconomic determinants of remittances has also highlighted the role of home and host interest rates. Interest rates are closely associated with an economy's return on financial assets. Higher interest rates in the home economy can therefore imply higher remittances if the migrants are motivated by investment prospects back home. Studies such as Adams (2009), El Sakka and McNabb (1999), and Lianos (1997) show a positive effect of home country interest rates on the flow of foreign remittances. Alper (2005) examines Turkish remittance inflows and finds that remittances are positively affected by the interest and currency rates in the long-term and negatively affected in the short term.

From the above brief review, we can infer that several home and host country factors influence remittance flows. However, there is no consensus among the researchers as to which, if any, of the two sets of macroeconomic factors play a bigger role in determining the flow of remittances. Vargas-Silva and Huang (2005), in their study of a host of Latin American economies, conclude that remittances are more responsive to host country's economic conditions than to economic conditions of home country. Kemegue et al. (2011) reach a similar conclusion in the context of Sub-Saharan African economies. In contrast, some studies e.g. Straubhaar (1986), Swamy (1981) find little role of macroeconomic factors in determining foreign remittances.

In this study, we examine key macroeconomic factors suggested in the literature to influence remittances. Having established the role of individual and household socioeconomic characteristics, we need to know to what extent the home and host country economic activity affects remittances. This will help us know more about the possible motives behind the

volume of money being officially transferred. The analysis will help us understand the evolution of remittance inflows to Pakistan during the last few decades, and their spectacular rise in the 2000s. Given the heterogenous nature of remittance flows to Pakistan, we analyse both the aggregate as well as region and host-country-wise determinants of remittances. The study is organized as follows: The next subsection presents the data and methodology used. Key findings are given in subsection 3. Conclusions follow.

2.4.2 Data and methodology

We examine the influence of macroeconomic variables including per capita annual output, real effective exchange rate (REER), real interest rate, consumer price index (CPI) and gross fixed capital formation (GFCF) on remittances for both the home and host countries. For this purpose, we construct three datasets. The first comprises macroeconomic variables pertaining to Pakistan from 1973 to 2010 (Table 2.4.1). Given that REER is available only from 1980, our dataset is restricted to 31 annual observations. We construct three regional variables, Gulf comprising of remittances from the six Gulf Cooperation Council states of Saudi Arabia, United Arab Emirates, Kuwait, Bahrain, Qatar and Oman, North America consisting of the United States and Canada, and Europe consisting of the three principal European remitting countries: the United Kingdom, Germany and Norway. As described previously, these three regions are the source of over 90 % of Pakistan's remittance receipts.

Table 2.4.1. Summary statistics for the home-country macroeconomic determinants of
remittances

VARIABLES	N	mean	Sd	min	Max
Gdp per capita constant 2000 us	38	456.3	111.1	290.4	668.5
Inflation consumer prices annu	38	9.624	5.521	2.914	26.66
Gross fixed capital formation	38	16.71	2.007	11.44	20.96
Real effective exchange rate ind	31	133.9	43.39	97.09	237.1
Call money rate	38	8.668	2.368	2.139	12.33
Population growth annual	38	2.678	0.599	1.761	3.436
Agriculture value added of g	38	26.84	4.046	20.33	36.03
Remittances	38	2,576	2,200	136	9,690
Bahrain	38	50.66	39.04	2.460	153.3
Canada	38	20.19	30.08	2.120	115.1
Germany	38	34.74	23.59	1.320	100.7
Kuwait	38	141.6	115.0	6.930	445.1
Norway	38	14.03	8.174	0.670	34.68
Qatar	38	63.60	83.02	2.170	354.1
Saudi Arabia	38	693.1	456.1	7.870	1,918
Oman	38	96.69	66.54	12.20	287.3
U a e	38	369.9	439.7	0	2,039
U k	38	197.6	172.2	49.29	876.4
U s a	38	413.7	574.2	9.980	1,771
North America	38	433.9	601.7	12.10	1,886
Gulf	38	1,416	1,108	31.74	5,194
Europe	38	246.4	198.1	59.76	992.3

Our second dataset is a panel containing macroeconomic variables for the above mentioned host countries (Table 2.4.2). Only remittances have a complete series with 418 observations starting from 1973. For the remaining variables, the number of observations varies between 242 for the REER and per capita GDP (402 observations). We alternately carry out our analysis using the official exchange rate, for which 368 observations are available. The variables are taken in their logged form.

Besides considering the home and host country economic activity, migrants may also react to the relative performance of the home economy compared with the host country. We therefore construct a third dataset made up of differential variables. Given higher inflation and real interest rates, and sharper fall in Pakistani Rupee with respect to other major currencies, we take CPI, real interest rate and the REER as a difference between Pakistan's and the host country's figures. For per capita GDP and investment rates, it is the other way round, and thus our variables are the difference between host and home GDP per capita and GFCF respectively.

Research on other developing countries has found variables such as migrant stock and political instability to play an important role in determining the amount of remittances (Chami et al. 2005, Freund and Spatafora, 2005, Vargas-Silva (2009)). As the overseas migrant community grows, so do normally the remittances. Political unrest acts on the amount of remittances negatively, as migrants, fearful of losing their savings or investment back home, prefer to keep their savings in the host country. Pakistan's migrant community has greatly evolved in the last three decades, growing in numbers, and diversifying geographically as well as in terms of qualification. The country has also gone through times of political instability during this period. However, we do not include these potentially important indicators in our model due to insufficient number of observations (more on this in Chapter 5). The amount that a migrant sends home, whether for altruistic, investment or insurance motives, crucially depends on whether his/her stay abroad is temporary or permanent. Migrants settled overseas with their immediate family members may have less need to remit, while migrants with temporary work visa may transfer more amounts both to build their nesteggs back home, and also because their ties with the home country may be stronger. Lacking a thorough Pakistani migrant survey, we are unable to account for this variable.

Table 2.4.2. Summary statistics for the host-country macroeconomic determinants of remittances

A. <u>Host country macroeconomic determinants</u>					
VARIABLES	N	mean	sd	min	Max
Remittances current us	418	190.5	335.3	0	2,039
Inflation consumer prices annu	310	3.978	5.035	-21.68	34.58
Real interest rate	262	4.945	8.352	-25.09	46.20
Real effective exchange rate ind	242	108.9	29.38	75.96	244.2
Official exchange rate lcu per	368	2.332	2.012	0.269	8.992
Gdp per capita current us	402	20,813	14,925	589.6	93,367
Gross fixed capital formation	342	20.84	5.507	5.814	44.06
B. <u>Macroeconomic differentials between the home and the host economy</u>					
VARIABLES	N	mean	sd	min	Max
Inflation consumer prices annu	279	5.718	5.397	-24.40	27.81
Real interest rate	54	-0.227	7.964	-44.86	13.64
Real effective exchange rate ind	217	23.98	39.51	-31.87	137.3
Official exchange rate lcu per	330	29.85	22.57	4.160	84.91
Gdp per capita constant 2000 us	343	20,546	10,931	3,343	61,035
Gross fixed capital formation	333	3.194	6.011	-17.47	27.57
Remittances current us	380	203.2	348.2	0	2,039

Data for all variables come from the World Bank open access data online, except for foreign remittances which come from State Bank of Pakistan (SBP).

The aggregate and region-wise home economy macroeconomic determinants models are estimated using Ordinary Least Squares (OLS), whereas the two panel models are estimated using random-effects panel regression technique. The home-economy model is also estimated using the General Method of Moments method to tackle potential endogeneity.

2.4.3 Main findings

Results given in table 2.4.3 show that remittances to Pakistan are responsive to the country's economic activity, exchange rate movements and interest rate changes, the three variables showing impacts significant at one percent level. GDP per capita appears to have the strongest impact of all the variables: one percent rise in per capita output implies an increase of remittances by a substantial 6.77 %. Real effective exchange rate index also shows a strong positive influence, one percent raise in the index being associated with 3.66% gain in remittances. Real interest rate has a small, though not negligible influence on remittances.

The strong relationship between remittances and home country output gives us a hint of the procyclical characteristic of remittance flows to Pakistan. Pakistani migrants tend to take advantage of the expanding economy and invest during the boom period. This is different from the altruistic interaction with the migrant's household that remittance incidence showed in the previous section. The negative influence of interest rates also points to a possible self-interested motive. Rising interest rates can signal the coming of difficult economic conditions in a developing country, and migrants react to this news by holding back their savings in the host economy.

Pakistani migrants appear to remit more when the local currency is depreciating. This may also suggest an investment-oriented behaviour. However, a sizeable depreciation in the Pakistani Rupee has generally been a consequence of deteriorating balance of payment situation. The resulting rise in remittances implies a helping hand, somewhat counterbalancing their procyclical response to per capita income. The effects of interest rates, exchange rate and economic activity on remittances can be considered a short-term interaction with the home economy. Lack of response to change in the country's investment rate can also be a case in point.

Table 2.4.3. Remittances and home country macroeconomic factors (OLS estimation)

VARIABLES	(1) Lnrem	(2) Ingulf	(3) Innorth	(4) Ineurope	(5) lnrem
Lngdppc	6.777*** (0.607)	6.706*** (0.633)	9.593*** (0.764)	5.839*** (0.781)	3.715*** (1.199)
Lncpi	0.089 (0.140)	0.0203 (0.129)	0.155 (0.208)	0.380** (0.151)	0.088 (0.107)
lninterest_rate	-0.673*** (0.137)	-0.530*** (0.131)	-1.359*** (0.186)	-0.823*** (0.138)	-0.384** (0.147)
Lnreer	3.666*** (0.382)	4.274*** (0.369)	3.366*** (0.519)	3.231*** (0.488)	3.315*** (0.414)
Lngfcf	0.202 (0.469)	-0.258 (0.523)	0.967 (0.596)	0.469 (0.620)	-0.784 (0.463)
Lnagriculture					-4.182*** (1.438)
Constant	-51.21*** (5.354)	-53.15*** (5.436)	-70.24*** (7.107)	-46.70*** (6.098)	-14.88 (13.67)
Observations	31	31	31	31	31
R-squared	0.824	0.820	0.897	0.806	0.871
Robust standard errors in parentheses					

Region-wise results (columns 2 - 4) paint a similar picture. All the three regional remittance aggregates show a strong influence of home country output. Remittances from North America respond the most, a finding that corroborates the conclusions of section 2.2.

Bouhga-Hagbe (2006) examine the macroeconomic determinants of remittances to Egypt, Jordan, Morocco, Pakistan and Tunisia, taking agricultural value added as a share of the GDP as a proxy for economic hardship. They come up with evidence of altruistic motives. Using this variable in our model (column 5) gives results in accordance with his finding. Pakistani remittances exhibit a substantial negative association with the country's agricultural output,

indicating that poor harvest or low market price of major crops follows higher remittance by Pakistani migrants. This response may be limited to migrants with households living in rural areas, and may contrast with the investment profile of urban migrants.

Several variables in our model may have two-way association with remittances. Factors such as a country's real exchange rate, per capita output and inflation are not only among the possible causes of remittances, but may also be driven by remittance flows themselves. To tackle this potential endogeneity problem at hand, we run regressions using the General Method of Moments (GMM) with lagged values of regressors as instruments. The results shown in table 2.4.4 maintain identical signs and levels of significance, as well as similar coefficients.

Table 2.4.4. Remittances and home country macroeconomic factors (GMM estimation)

VARIABLES	lnrem	lngulf	lnnorth	lneurope
Lngdppc	7.188*** (1.154)	7.484*** (1.150)	10.15*** (1.378)	6.596*** (0.941)
Lncpi	-0.318 (0.286)	-0.406 (0.274)	-0.169 (0.398)	0.288 (0.219)
lninterest_rate	-0.460** (0.207)	-0.349* (0.187)	-1.264*** (0.254)	-0.837*** (0.167)
Lnreer	3.684*** (0.664)	4.591*** (0.583)	3.513*** (0.920)	3.650*** (0.609)
Lngfcf	2.266 (1.594)	1.763 (1.643)	2.923 (1.930)	1.091 (1.160)
Constant	-59.31*** (9.952)	-64.75*** (10.06)	-79.48*** (12.36)	-54.97*** (8.010)
Observations	30	30	30	30
R-squared	0.724	0.688	0.867	0.800

Robust standard errors in parentheses

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

Table 2.4.5. Remittances and host country macroeconomic factors

VARIABLES	(1) lnremittances	(2) lnremittances	(3) lnremittances
Lngdppc	1.498*** (0.131)	1.428*** (0.0903)	1.332*** (0.110)
Lncpi	0.183** (0.083)	-0.123** (0.050)	0.112* (0.064)
lnexchange_rate_nominal	-1.522*** (0.312)	-0.973*** (0.341)	
lninterest_rate	-0.006 (0.066)		
Lngfcf	1.423*** (0.426)	1.609*** (0.232)	1.115*** (0.361)
Lnreer			-0.112 (0.307)
Constant	-15.34*** (1.932)	-14.56*** (1.292)	-11.91*** (2.015)
Observations	147	237	189
Number of centrycode	8	9	7
Standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

As regards host country economic factors, host country output and investment rates show the strongest influence on remittances (Table 2.4.5) : one percent rise in them leading to a 1.4% increase in remittances. Higher per capita output in the host economy signifies at an average better economic prospects for the migrant. Migrants therefore feel confident in their conditions, and can take better care of the household back home. They may also have higher savings as a result of booming host economy. Similar motive is probably at work in case of host economy currency fluctuations : remittances seem to respond to host country exchange

rates negatively, implying that migrants tend to transfer more money back home when the host country currency is rising. Interest rate does not appear to impact the volume of remittances. Given a small number of observations for interest rate and real exchange rate, we repeat our estimations excluding interest rate and including nominal effective exchange rate. The gist of our findings remains the same, with per capita output and investment rate maintaining a strong positive coefficient. Inflation in the host countries shows a small and non-robust effect on remittances.

Looking at the remittance response to the difference between home and host macroeconomic variables (Table 2.4.6), we find a positive and mostly significant effect of difference in home and host output, inflation and real exchange rates. Increasing gap between host and home per capita output implies better economic situation in the host country relative to the home country, which allows migrants to remit more. Higher difference in inflation and real exchange rates may indicate weak economic situation in the home economy leading to more money transferred, suggesting a possible altruistic motive behind these remittances. Just like the host country interest rate, the home and host country interest rate differential does not appear to significantly impact remittances. This again points to altruistic motives and corroborates the findings of Katseli and Glystos (1986).

Here, it needs to be mentioned that the differential model is based on a small number of observations (ranging from 40 to 223). The results of this model should therefore be interpreted with caution.

Table 2.4.6. Remittances and home - host macroeconomic differentials

VARIABLES	-1 remittances current us	-2 remittances current us	-3 remittances current us
Gdp per capita constant 2000 us	0.0173* (0.010)	0.0303*** (0.006)	0.007 (0.004)
inflation consumer prices annu	6.413 (20.08)	17.90*** (5.472)	12.36*** (3.820)
real effective exchange rate ind	31.12** (12.75)	0.975 (1.004)	
real interest rate	-22.99 (22.68)		
gross fixed capital formation	-25.84 (22.84)	11.92** (5.185)	11.44** (4.581)
official exchange rate lcu per			5.349*** (1.192)
Constant	-163.0 (380.3)	-566.2*** (204.7)	-239.8** (116.6)
Observations	40	194	223
Number of cntrycode	6	7	8
Standard errors in parentheses			

2.4.4 Concluding remarks

In this section, we examined the role macroeconomic conditions play in determining the volume of remittances. We found evidence for both home and host economic activity. Remittances to Pakistan strongly respond to home and host GDP per capita. They also increase following depreciation of the local currency or appreciation of the host country currency. The results indicate an over all investor profile of Pakistani migrants. This notwithstanding, some altruistic motives do also appear to be in play. The findings of this section, together with those of the previous section, indicate that although the decision of

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whether or not to remit is mostly based upon altruistic concern for the Pakistani migrant's home-based household, the amount and timing of remittance is mainly driven by macroeconomic factors. The latter consequently implies an investor's portfolio allocation perspective.

From these findings, it can be inferred that remittances to Pakistan react both to home as well as host macroeconomic variables. Government of Pakistan should therefore anticipate remittance receipts keeping in view the economic conditions of Pakistanis' main migration destinations. A mostly procyclical behaviour of remittances is another factor the policy makers should consider, as remittances can suddenly stop when the country requires them the most.

This chapter examined the nature and causes of remittances to Pakistan. In the next two chapters, we study some of the ways they impact the country's economy.

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APPENDIX**APPENDIX A. VOLATILITY OF REMITTANCES**

LM test for autoregressive conditional heteroskedasticity (ARCH)

d.lnrem				
lags(p)	chi2	df	Prob > chi2	
-----+-----				
1	28.951	1	0	
d.lngulf				
1	43.792	1	0	
d.lnnorth				
1	18.216	1	0	
d.lneurope				
1	16.447	1	0.0001	
d.lnsaudi				
1	15.678	1	0.0001	
d.lnu_a_e				
1	44.829	1	0	
d.lnkuwait				
1	124.573	1	0	
d.lnbahrain				
1	43.719	1	0	
d.lnqatar				
1	19.808	1	0	
d.lnoman				
1	22.336	1	0	
d.lnusa				
1	20.570	1	0	
d.lncanada				
1	44.111	1	0	
d.lnu_k				
1	43.787	1	0	

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d.lngermany				
1		47.613	1	0
d.lnnorway				
1		65.041	1	0
d.lnswitzerland				
1		39.043	1	0

H0: no ARCH effects vs. H1: ARCH(p) disturbance

APPENDIX B. MICROECONOMIC DETERMINANTS

Diagnostic tests: 2005 Baseline equation

Probit model for foreign remittances – Classification test

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	32	41	73
-	516	12320	12836
-----+-----+-----			
Total	548	12361	12909

Classified + if predicted $\Pr(D) \geq .5$ True D defined as $\text{forrem} \neq 0$

Sensitivity	$\Pr(+ D)$	5.84%
Specificity	$\Pr(- \sim D)$	99.67%
Positive predictive value	$\Pr(D +)$	43.84%
Negative predictive value	$\Pr(\sim D -)$	95.98%

False + rate for true $\sim D$	$\Pr(+ \sim D)$	0.33%
False - rate for true D	$\Pr(- D)$	94.16%
False + rate for classified +	$\Pr(\sim D +)$	56.16%
False - rate for classified -	$\Pr(D -)$	4.02%

Correctly classified	95.69%
----------------------	--------

Chapter 2: Remittances to PAKISTAN: nature and characteristics

Probit model for forrem, goodness-of-fit test

```

number of observations =   12909
number of covariate patterns =   12577
Pearson chi2(12569) =   12537.79
Prob > chi2 =       0.5764

```

```

-----+-----
Model |  Obs   ll(null)   ll(model)   df   AIC   BIC
-----+-----
. | 12909 -2267.554 -2032.029    8  4080.058  4139.783

```

```

Variable |   VIF   1/VIF
-----+-----
Lninc    |  19.74   0.050
Agehead  |  12.31   0.081
hhsize   |   5.72   0.174
province |   4.60   0.217
enrollment~s |  2.52   0.396
region   |   1.85   0.540
femalehead |  1.04   0.961
-----+-----
Mean VIF |   6.83

```

Alternate models

Probit model for forrem

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	26	29	55
-	522	12332	12854
-----+-----+-----			
Total	548	12361	12909

Classified + if predicted $\Pr(D) \geq .5$

True D defined as forrem != 0

Sensitivity	$\Pr(+ D)$	4.74%
Specificity	$\Pr(- \sim D)$	99.77%
Positive predictive value	$\Pr(D +)$	47.27%
Negative predictive value	$\Pr(\sim D -)$	95.94%

False + rate for true ~D	$\Pr(+ \sim D)$	0.23%
False - rate for true D	$\Pr(- D)$	95.26%
False + rate for classified +	$\Pr(\sim D +)$	52.73%
False - rate for classified -	$\Pr(D -)$	4.06%

Correctly classified 95.73%

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Probit model for forrem, goodness-of-fit test

number of observations = 12909

number of covariate patterns = 12536

Pearson chi2(12528) = 12759.03

Prob > chi2 = 0.0729

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	12909	-2267.554	-2057.633	8	4131.265	4190.991

Variable	VIF	1/VIF
Lninc	19.16	0.052
Agehead	11.89	0.084
province	4.60	0.217
dependent	3.14	0.318
enrollment~s	2.53	0.395
region	1.86	0.537
femalehead	1.04	0.961
Mean VIF	6.32	

Chapter 2: Remittances to PAKISTAN: nature and characteristics

Probit model for forrem

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	33	40	73
-	515	12321	12836
-----+-----+-----			
Total	548	12361	12909

Classified + if predicted $\Pr(D) \geq .5$

True D defined as forrem != 0

Sensitivity	$\Pr(+ D)$	6.02%
Specificity	$\Pr(- \sim D)$	99.68%
Positive predictive value	$\Pr(D +)$	45.21%
Negative predictive value	$\Pr(\sim D -)$	95.99%

False + rate for true ~D	$\Pr(+ \sim D)$	0.32%
False - rate for true D	$\Pr(- D)$	93.98%
False + rate for classified +	$\Pr(\sim D +)$	54.79%
False - rate for classified -	$\Pr(D -)$	4.01%

Correctly classified		95.70%

Chapter 2: Remittances to PAKISTAN: nature and characteristics

Probit model for forrem, goodness-of-fit test

number of observations = 12909

number of covariate patterns = 12577

Pearson chi2(12569) = 12545.25

Prob > chi2 = 0.5579

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	12909	-2267.554	-2030.662	8	4077.325	4137.05

Variable	VIF	1/VIF
Lninc	54.00	0.018
Maleadult	44.43	0.022
agehead	12.31	0.081
hhsiz	5.72	0.174
province	4.67	0.214
enrollment~s	2.53	0.395
region	1.86	0.536
Mean VIF	17.93	

2007

Baseline equation

Probit model for forrem

----- True -----				
Classified	D	~D		Total
-----+-----+-----				
+	12	2		14
-	30	940		970
-----+-----+-----				
Total	42	942		984

Classified + if predicted $\Pr(D) \geq .5$

True D defined as forrem != 0

Sensitivity	$\Pr(+ D)$	28.57%
Specificity	$\Pr(- \sim D)$	99.79%
Positive predictive value	$\Pr(D +)$	85.71%
Negative predictive value	$\Pr(\sim D -)$	96.91%

False + rate for true ~D	$\Pr(+ \sim D)$	0.21%
False - rate for true D	$\Pr(- D)$	71.43%
False + rate for classified +	$\Pr(\sim D +)$	14.29%
False - rate for classified -	$\Pr(D -)$	3.09%

Correctly classified	96.75%
----------------------	--------

Probit model for forrem, goodness-of-fit test

number of observations = 984
number of covariate patterns = 975
Pearson chi2(967) = 994.62
Prob > chi2 = 0.2620

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	984	-173.556	-123.823	8	263.647	302.780

Variable	VIF	1/VIF
Lninc	17.73	0.056
Agehead	12.35	0.080
Hhsize	6.16	0.162
Province	4.51	0.221
enrollment~s	3.01	0.332
region	2.14	0.466
femalehead	1.06	0.940
Mean VIF	6.71	

Alternate models

Probit model for forrem

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	13	1	14
-	29	941	970
-----+-----+-----			
Total	42	942	984

Classified + if predicted $\Pr(D) \geq .5$

True D defined as forrem != 0

Sensitivity	$\Pr(+ D)$	30.95%
Specificity	$\Pr(- \sim D)$	99.89%
Positive predictive value	$\Pr(D +)$	92.86%
Negative predictive value	$\Pr(\sim D -)$	97.01%

False + rate for true $\sim D$	$\Pr(+ \sim D)$	0.11%
False - rate for true D	$\Pr(- D)$	69.05%
False + rate for classified +	$\Pr(\sim D +)$	7.14%
False - rate for classified -	$\Pr(D -)$	2.99%

Correctly classified	96.95%
----------------------	--------

Chapter 2: Remittances to PAKISTAN: nature and characteristics

Probit model for forrem, goodness-of-fit test

number of observations = 984
 number of covariate patterns = 975
 Pearson chi2(967) = 1040.10
 Prob > chi2 = 0.050

-----+-----						
Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	984	-173.556	-124.781	8	265.562	304.695

Variable	VIF	1/VIF
-----+-----		
Lninc	17.27	0.057
Agehead	11.64	0.085
province	4.53	0.220
dependent	3.44	0.290
enrollment~s	3.01	0.332
region	2.16	0.462
femalehead	1.06	0.940
-----+-----		
Mean VIF	6.16	

Probit model for forrem

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	14	3	17
-	28	939	967
-----+-----+-----			
Total	42	942	984

Classified + if predicted $\Pr(D) \geq .5$

True D defined as forrem != 0

Sensitivity	$\Pr(+ D)$	33.33%	
Specificity	$\Pr(- \sim D)$	99.68%	
Positive predictive value	$\Pr(D +)$	82.35%	
Negative predictive value	$\Pr(\sim D -)$	97.10%	

False + rate for true ~D	$\Pr(+ \sim D)$	0.32%	
False - rate for true D	$\Pr(- D)$	66.67%	
False + rate for classified +	$\Pr(\sim D +)$	17.65%	
False - rate for classified -	$\Pr(D -)$	2.90%	

Correctly classified		96.85%	

Chapter 2: Remittances to PAKISTAN: nature and characteristics

Probit model for forrem, goodness-of-fit test

number of observations = 984
 number of covariate patterns = 975
 Pearson chi2(967) = 984.26
 Prob > chi2 = 0.342

-----+-----						
Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	984	-173.556	-133.104	8	282.209	321.342

Variable	VIF	1/VIF
-----+-----		
Lninc	17.51	0.057
Agehead	13.40	0.074
Hhsize	8.77	0.114
Maleadult	6.44	0.155
Province	4.53	0.220
enrollment~s	3.01	0.331
region	2.13	0.468
-----+-----		
Mean VIF	7.97	

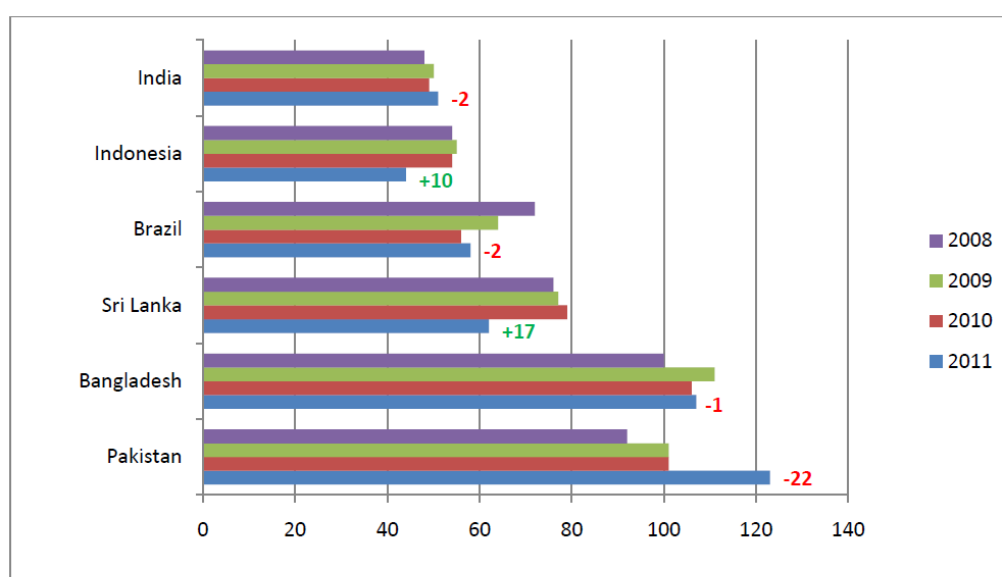
CHAPTER 3: REMITTANCES TO PAKISTAN AND COMPETITIVENESS

3.1 OVERVIEW

According to the Global Competitiveness Index 2010-11 (GCI), Pakistan was ranked 123rd in the list, with only 12% countries further below it. The country lost 22 positions in the ranking with respect to the previous year. Although Pakistan scored relatively well in innovation, sophistication and market size, it fares badly in macroeconomic policy and human resources compared to its neighbours and other comparable developing countries (Figure 3.1.1)¹⁴. Pakistan's macroeconomic and labour market indicators are in fact among its weakest points on the index (Competitiveness Support Fund 2011). These two are among the main channels through which foreign remittance flows can impact a country's competitiveness. Can then remittances be a cause of falling competitiveness for Pakistan? In this chapter, we aim to study the relationship of remittances with the country's macroeconomic and labour market factors. In the first part, we study the remittances' impact on the country's real effective exchange rate. A conclusive real exchange appreciation impact of remittances will suggest a tougher competition for the country's traded sector. This, along with an increasing importance of the non tradable sector, form the symptoms of the Dutch disease. In the second part of the chapter, we examine remittances' interaction with the labour market. A substantial drop in the labour market participation of remittance-receiving households would indicate lower labour supply and a more expensive labour force, leading to lower competitiveness.

14 For a detailed analysis of Pakistan's current competitiveness situation, see GCF's State of Pakistan's Competitiveness Report.

Figure 3.1.1. GCI Rankings for Pakistan and five comparable countries



Source: GCF 2011

3.2 REMITTANCES AND DUTCH DISEASE¹⁵

3.2.1 Introduction

Remittances are an important source of foreign exchange for developing countries. The volume of remittance transfers to many developing countries, including Pakistan, exceeds that of foreign private capital and official development assistance combined. Remittances are found to promote economic growth (Faini, 2002; Garcia-Fuentes and Kennedy, 2009; Stark and Lucas, 1988). Rise in remittances has also made the developing countries governments less reliant on other financial inflows for their foreign exchange requirements.

However, remittances can lead to the overshooting of a country's real exchange rate¹⁶ and hurt its competitiveness, a phenomenon known as the Dutch disease¹⁷. The overvaluated

¹⁵ This section benefited from the useful comments and suggestions of the participants of various conferences. Earlier versions of this section were presented at DIAL Development Conference: Shocks in Developing Countries, June 30th and July 1st 2011, Paris, and the 50th Annual Congress of Société Canadienne de Science Économique, May 11th to 13th 2011, Sherbrooke, Canada, as well as the department's CATT seminar, 3rd February 2010.

exchange rate makes the country's exports relatively expensive, imports cheaper, and thus puts pressure on the country's current account¹⁸. The additional demand stemming from the remitted money raises prices in the non-tradable sector while the prices can not move much in the tradable sector in a small open economy. This shifts resources from industry and agriculture (tradable sectors) to services (non-tradable sector), making the country's tradable sector less competitive. Why does this matter? In the words of Rajan and Subramanian (2010): "a number of studies (Jones and Olken (2005) and Rodrik (2007)) have argued that the traded goods sector is the channel through which an economy absorbs best practices from abroad. The absence of these learning-by-doing spillovers, which may be critical to long run productivity growth, could be one constraint on growth".

The aforementioned spending and resource shifting effects of the Dutch disease which lead to lower competitiveness have been examined for various developing countries. For example, in their study of 13 Latin American and Caribbean countries, Amuedo –Dorantes and Pozo (2004) find that a 100 percent rise of remittances cause the real exchange rate (REER) to appreciate by 22 percent. Similarly, Bourdet and Falck (2006), in their empirical analysis of the Cape Verdean economy, find evidence of adverse effects of remittances on the country's competitiveness. A doubling of remittances leads to a 12 % appreciation in the country's real exchange rate. Acosta et al. (2009) examine a panel of 109 developing countries for the period of 1990 to 2003 and find that capital flows from abroad help the exchange rate go up. Kapur (2004) argues that the exchange-rate appreciating effect of remittances is stronger among smaller developing countries.

¹⁶ Real exchange rate represents the nominal exchange rate adjusted for relative changes in consumer prices. An increase in the real exchange rate denotes a depreciation of home-country currency.

¹⁷ The phenomenon can be caused by any large foreign exchange inflows, such as natural resource boom, development assistance, remittances or foreign direct investments. The term initially referred to the falling competitiveness the Netherlands faced in the 1960s after the discovery of large natural gas reserves.

¹⁸ For instance, Kappler et al. (2011) show that in a sample of 128 developing countries, within three years after a major appreciation, the current account balance on average deteriorates by three percentage points of GDP, savings are reduced while export growth slows down substantially.

As discussed in the next section, remittances have also been associated with declining competitiveness through a decrease in the labour supply in the remittance-receiving country (Amuedo-Dorante and Pozo, 2006; Bussolo and Medvedev, 2007; Görlich et al., 2007; Kim, 2007; Rodriguez and Tiongson, 2001).

However, there is no consensus on the deleterious effects of remittances on external competitiveness. Rajan and Subramanian (2005), for instance, find remittances to be different from other financial flows in this sense. Mongardini and Rayner (2009) look for the impact of worker remittances in Sub-Saharan Africa, and find no link with rise in exchange rate. Grabel (2008) suggests that the short-term impacts of remittances are similar to those of other financial inflows, with the differences mostly due to different economic policies.

In the context of Pakistan, Hyder and Mahboob (2006) estimate that an increase in workers' remittances of one percentage point of GDP is associated with an appreciation of Pakistan's real effective exchange rate by 0.16 percent. Similarly Ahmed (2009) finds that a 1 % increase in remittances as a share of GDP appreciates Pakistan's real exchange rate by approximately 2.5%. Other studies on Pakistan include Afridi (1995), Chishti and Hasan (1993), Haque and Montiel (1992, 1998), Hussain (2008), Janjua (2007), and Rehman et al (2010). These studies generally evaluate the country's equilibrium exchange rate, and do not study the resource movement symptoms of Dutch disease.

Remittances, being financial inflows, are intrinsically associated with the country's monetary aggregates, and hence, influence and may in turn be influenced by the country's monetary policy. Any model studying the impact of worker remittances on a developing economy will therefore contain an element of uncertainty present due to the role of the country's central bank. Whether by performing sterilization operations in the open market or controlling money supply to combat inflation acceleration, the central bank appears in the remittances – real exchange rate equation in one way or the other. Given this uncertainty, and the availability of limited number of observations, significant number of parameters and potential endogeneity issue make the use of standard Ordinary Least Squares (OLS) techniques problematic for the problem at hand. The use of probabilistic Bayesian paradigm can help in such a situation. In the section, we study the Dutch disease aspect of migrant remittances to Pakistan using Bayesian analytical methods.

Though the use of probabilistic approach is increasing in economic studies, particularly those dealing with macro and financial economics¹⁹, this is to the best of our knowledge, the first application of the technique in a study of Dutch disease effects.

n

In this study, we employ both annual as well as monthly data, examining the periods 1980-2008 and July 2000-March 2009 respectively. This helps us gauge both the short- and medium/long-run role of foreign remittances on the country's external and internal competitiveness. Appropriate instrumental variable has been selected and constructed to tackle the potential endogeneity of remittances due to reverse causality between the money remitted and the country's real exchange rate. We also look at the sector-wise effect of remittances to determine which sectors are losing competitiveness as a result of remittance inflows. Consequently, we are able to monitor both the spending as well as the resource movement aspects of the Dutch disease.

Moreover, in assessing the remittances' impact on the REER, remittance flows are disaggregated with respect to remitting regions. This helps better examine the differential impact of remittance transfers pertaining to different Pakistani migrant communities. In the previous chapter, we saw that migrant remittances from the three main remitting regions differ substantially in their macroeconomic behaviour. The volatility and magnitude of remittances from these regions varies substantially, and can therefore impact the country's course of currency and sectorial transformation in a differential manner. A region-wise analysis of remittances' impact on competitiveness can thereby help us better comprehend their role in the economy.

We are mainly interested in answering the following questions:

Has Pakistan's real exchange rate gone up as a result of remittance inflows?

If so, remittance flows from which regions have contributed the most?

Has the country's competitiveness suffered as a result? How, if so, have the inflows altered the country's economic structure?

¹⁹ For other applications of Bayesian paradigm in macroeconomics, see for example Clark and Doh (2011)'s evaluation of trend inflation and Antonakakis and Tondl (2011)'s study on the determinants of FDI.

In the rest of the section, we attempt at analyzing these questions. First, we present key facts regarding Pakistan's exchange rate (Subsection 2). Subsection 3 introduces the model and d?mpact of remittances on the reallocation of resources between the tradable and non-tradable sectors. The last subsection concludes the study and provides some policy recommendations.

Remittances and Exchange rate of Pakistan: Some Stylized facts

Historically, remittances sent by the overseas Pakistanis have ranged from 1 to 10 per cent of the country's annual output, average during the last thirty years being 5%.

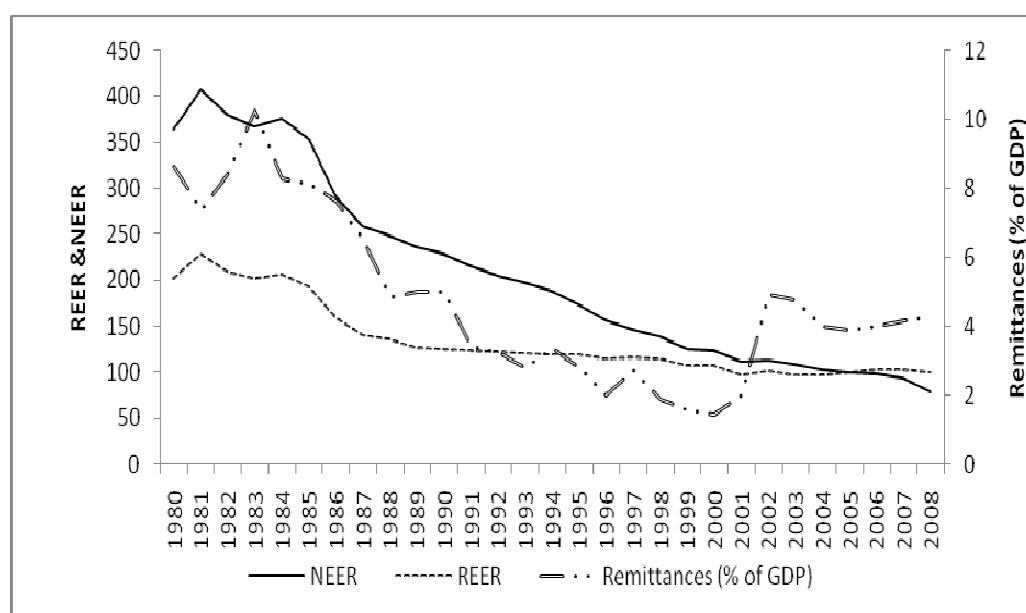
Being such a substantial source of foreign exchange, remittances surely have generated some effect on Pakistan's exchange rate. This raises the possibility of the economy facing the Dutch disease. A cursory look at figure 3.2.1 shows a correlation between the remittance flows and Pakistan's Real Effective Exchange Rate (REER). The Pakistani Rupee gradually fell during the 1980s and 90s. In 1982, Pakistan abandoned fixed exchange rate and switched to a managed float regime. The Rupee fell sharply in the following decades, owing mainly to chronic trade deficit. This was despite the sharp rise in official migrant remittances which reached an all time high of ten percent of the GDP in the financial year 1983. The nominal exchange rate dropped from Rs. 10 to a US Dollar to over 50 in late 1990s.

The currency continued sliding till the beginning of the new century, when Pakistan switched to a free-float after two years of multiple and dirty-float exchange rates. This led to an immediate drop of 18.5 % in the financial year 2001.

The Rupee appreciated in early 2000s in part due to a boost of formal remittance inflows starting from the financial year 2001. This period witnessed higher inflation in the country compared to its major trade partners, and an even sharper nominal rise of other major currencies against the US Dollar than the Pakistani Rupee. However, by the middle of the decade, high financial inflows had begun to take their toll and the REER had again begun to fall²⁰.

²⁰ Pakistan's real exchange index was at the same level in June 2009 as in January 2001.

Figure 3.2.1. Pakistan's Real and Nominal Exchange Rates (year 2000 = 100) and
Remittances as a share of the GDP



Source: WB Online 'World Development Indicators' & IFS database

The State Bank of Pakistan (SBP) targets interest rates to pursue the twin goals of growth and price level adjustment. It sells and purchases treasury bills, and intervenes in the open market to inject or mop up money to balance the monetary system. In spite of this occasional intervention policy, money growth in the economy has remained somewhat high, consistently in the double digits during the previous decade,²¹ and inflation rate has remained above the comfort zone²², putting the country's export sector under increasing pressure. Pakistan competes with other developing countries in mostly agricultural and low-cost industrial products. Major items include cotton, textiles and apparels, rice, leather goods, fish, surgical instruments, sporting goods, light machinery, cement, and petroleum products. Margins for these products are often low in the international market, and even small fall in price

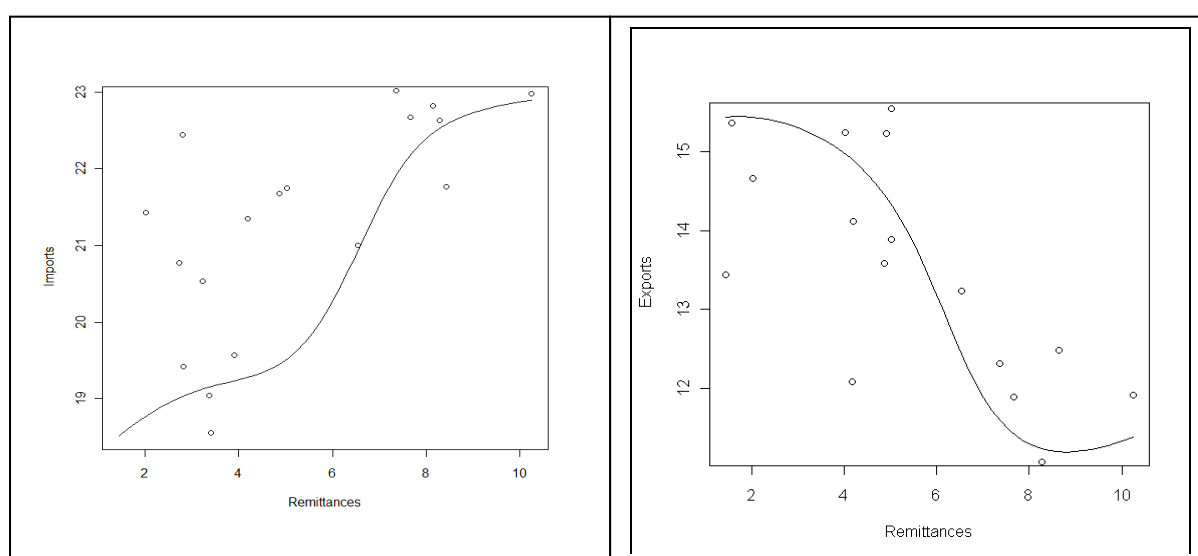
²¹ The growth in the country's mass of money in circulation remained in double digits in all years of the last decade (except for the year 2008).

²² For instance, the inflation rate rose by 24.3 per cent in the financial year 2008-09. In cumulative terms, the economy experienced an inflation of 66 per cent between June 2007 and Oct 2010 (SBP 2010).

competitiveness can cost the exporters their market share. Figure 3.2.2 gives a nonparametric estimation of the relationship between remittances to Pakistan and its exports and imports. Prima facie, there is a negative relationship between exports and remittances (elasticity between remittances and exports as a share of GDP is, ceteris paribus, -0.20 as against +0.16 for imports).

This preliminary evidence of the Dutch disease needs to be substantiated. For this, we proceed and study the drivers of real exchange rate (REER) in Pakistan.

Figure 3.2.2. Relationship between Remittances, imports, and exports (millions of USD)
(Kernel density estimation)



Source: authors' calculations based on WB Online 'World Development Indicators'.

3.2.2 Empirical Analysis

A. *Econometric strategy*

Real effective exchange rate (REER) is considered a major determinant of a country's external competitiveness. It is the relative price of domestic to foreign goods. An appreciation of the REER reduces the profitability of the export oriented sectors of the economy by raising their relative costs and by making the non-tradables relatively cheaper. Following Edwards (1988; 1989), and Montiel (1999), the Real Effective Exchange Rate (REER) can be considered as a measure of relative prices of the tradables and non-tradables, determined by

various macroeconomic fundamentals driving the internal or external equilibrium. These fundamentals (also called determinants or drivers) explain, at least partly, the medium to long-term behaviour of the real exchange rate (Engel et al. 2007). For a review of literature on the REER determinants, see for instance, Edwards (1989), Edwards and Savastano (2000), Froot and Rogoff (1995), Hinkle and Montiel (1999) and Rogoff (1996).

A country's real exchange rate can be estimated using various measures and macroeconomic models (more on it below), and the choice of the appropriate measure depends on the question under study (Driver and Westaway 2004). In this study, we are mainly concerned with whether or not foreign remittances have affected the country's competitiveness²³. For this, we employ Real Effective Exchange Rate (REER) and examine its interaction with migrant remittances using annual as well as monthly data.

First, we analyse the impact of our selected annual variables on Pakistan's real effective exchange rate. Following the literature on drivers of REER, our model can be written as:

$$\begin{aligned} REER_t = & \theta_0 + \theta_1 TOT_t + \theta_2 OPEN_t + \theta_3 Money\ growth_t + \theta_4 GOV_t + \theta_5 GDP_{pct} \\ & + \theta_6 FDI_t + \theta_7 REMIT_t + \theta_8 ODA_t + \theta_9 Exchange\ rate\ regime_t + \theta_{10} Disaster_t + \varepsilon_t \end{aligned}$$

(1)

Here, FDI represents the foreign direct investments, ODA represents the official development assistance (the two taken as a share of GDP), TOT represents the terms of trade, OPEN stands for the trade openness as a share of GDP, GOV represents the public expenditure to GDP, and PROD is the proxy for productivity. Besides, POP indicates the demographic change, M2 growth the growth in money supply, 2000 the dummy variable for exchange regime change, and disaster the dummy indicator for natural disaster hitting the country. θ is the parameter to be estimated and ε stands for the errors. All the variables except for the growth of money supply and the dummy variables are taken in their log form (The variables and the reasons for their inclusion are explained below. Summary statistics are shown in table 3.2.1.

²³ We do not consider issues related to real exchange rate misalignments. Models such as Behavioural, Desired, Fundamental, Natural or Permanent Equilibrium Exchange Rate are thereby not estimated.

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Table 3.2.1. Summary statistics for Annual and Monthly models

Yearly variable	Label	Min.	Mean	SD	Max.
REER	Real effective exchange rate index (2005 = 100)	96.91	134.27	40.382	228.16
Rem	Workers' remittances and compensation of employees, received (% of GDP)	1.454	4.747	2.430	10.248
Open	Trade (% of GDP)	25.59	31.13	3.348	38.23
TOT	Net barter terms of trade index (2000 = 100)	57.63	107.71	21.689	150.00
GOV	Expense (% of GDP)	7.781	11.347	2.382	16.805
GDPpcw	GDP per capita weighted	11399	15686	1466.366	18851
GDPpcp	GDP per capita (current US\$)	372.4	523.4	91.965	702.8
Pop	Age dependency ratio (% of working-age population)	70.26	84.87	7.101	93.17
ODA	Net ODA received (% of GDP)	0.939	2.242	0.957	4.984
FDI	Foreign direct investment, net inflows (% of GDP)	0.102	0.984	0.975	3.904
IV	Instrumental variable for remittances	1345	2057	5344.937	31128
ME	Remittances from Middle East (current US\$)	0.920	2.977	2.177	7.950
Europe	Remittances from Europe(current US\$)	0.12	0.46	0.246	0.93
America	Remittances from North America(current US\$)	0.110	0.547	0.397	1.500
Money growth	Money growth rate	4.314	14.967	5.832	29.301
TNT	Tradable to non-Tradable ratio				
Monthly variables		Min.	Mean	SD	Max.
REER	Real effective exchange rate index (2005 = 100)	93.02	100.00	3.021	104.10

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Rem	Workers' remittances and compensation of employees, received (current US\$)	84.74	371.60	109.390	602.20
FDI	Foreign direct investment, net inflows(current US\$)	18.30	212.20	237.566	1263.00
Money Market Rate	Call Money Rate	0.740	6.336	3.051	11.29
Export	Imports (current US\$)	39560	71550	19783.358	1316
Import	Exports (current US\$)	42880	111100	54946.968	2624
Money Growth rate	Money Growth rate	-0.063	0.016	0.043	0.334
ME	Remittances from the Middle East (current US\$)	44.2	182.5	73.117	333.9
Europe	Remittances from Europe(current US\$)	5.31	31.31	15.125	66.46
America	Remittances from North America(current US\$)	7.73	91.11	40.880	152.30

Along with the impact of aggregate remittance flows, we include three region-wise remittance variables to study the corresponding impact of remittances coming from the three principal remitting geographical zones²⁴. The three regions are the Persian Gulf (comprising six Gulf Cooperation Council states of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates), North America (consisting of Canada and the U.S) and Europe (mainly the United Kingdom).

Remittances may also affect the REER in the short-run. To account for this possibility, we study the behaviour of the REER in the last decade using monthly data. We take imports, exports, remittances, FDI, and money growth rate as potential drivers for this analysis. Monthly data for GDP are not available, hence we are unable to determine the Balassa-

²⁴ The regional regressions are not instrumented as the R packages used for these estimations do not allow multiple variable instruments.

Samuelson effect. Similarly, terms of trade, demographic evolution and official development assistance are not included due to data inavailability. As discussed above, these fundamentals explain a big part of REER movement, and in their absence, the monthly estimations can only be considered suggestive. This analysis can show the robustness of the impacts of remittances on the annual REER. Alternatively, it can hint at the way in which the impact has deviated in the recent years from the over all trend.

Once the existence of Dutch disease has been inferred through REER appreciation mechanism, we go further and estimate the remittances' association with the tradables to non-tradables ratio (TNT) in the country. The course of this ratio, calculated as the sum of agricultural and industrial value-added weighted by the services sector value-added (Lartey, Mandelman and Acosta, 2008), approximates the magnitude and direction of resource reallocation through the sectoral movement of resources. We also construct alternative series of tradables and non-tradables using disaggregated sector-wise data, in which the tradable sector consists of agricultural and industrial goods and services that the country has traded in the last three decades.

B. Choice of variables

The REER can be measured in different ways, each measure appropriate for a particular line of investigation. We take Consumer Price Index (CPI)-based Real Effective Exchange Rate (REER) index as our indicator of choice, defined as the nominal effective exchange rate index adjusted for relative changes in consumer prices. The REER for the Pakistani Rupee is calculated as a geometric-weighted mean of the level of consumer prices in Pakistan relative to its major trade partners. The REER can also be calculated using Wholesale Price Index (WPI) or Producer Price Index (PPI). Unlike CPI-based REER, these two give a higher weightage to the tradables than the domestic non-tradables. Given that non-tradables constitute half of Pakistan's output, the use of CPI-based REER should be more suitable for this analysis.

Remittances are taken as a share of GDP. As discussed above, foreign remittances may cause the real exchange rate to appreciate. They can however equally respond to changes in the country's exchange rate. This is because migrants may vary their remitting behaviour,

keeping in mind the welfare of the recipients and their investment plans. In other words, migrants' behaviour, whether altruist, self-interested or compensatory, plays a role in the determination of a country's exchange rate. Money remitted for investment motives, for instance, would likely be procyclical and may therefore push the real exchange rate further up; the reverse may happen in the case of altruistic remittances. This means that remittances may be endogenous to the REER in our model and thus need to be instrumented.

Several instruments for remittances have been proposed in the literature, such as the stock or flow of migrants, distance from the remittance sending country, remittances to the rest of the world, population, recipient country's latitude, school enrolment, population density etc. Nevertheless, data availability precludes some of them, while others are not found appropriate in our case. The stock or flow of migrants can be an excellent instrument, but complete and reliable data on the variable are not available (see chapter 2 for a discussion on the issue). Remittances to Pakistan are found to be strongly correlated both to home as well as host countries' economic situation (chapter 2). Therefore, remittances to Pakistan may not be strongly associated with remittances to the rest of the world. Likewise, latitude does not appear to be a pertinent instrument for remittances to Pakistan. The choice of latitude is based on the premise that most host countries are in the north, while the migrant-sending countries are located in the south. In case of Pakistan however, a big chunk of remittances comes from the Persian Gulf states which are further to the south of Pakistan. Likewise, the reasoning behind the choice of distance as instrument for remittances is that greater distances between the migrant-sending and receiving countries are inversely proportional to migration, and ultimately the amount remitted by the migrants. Although millions of Pakistani migrants live in the nearby Gulf states and their remittances make up a major part of the total, yet two of the four major sources of Pakistani remittances are the distant United States and United Kingdom.

We take the per capita output of Pakistan's top ten remittance-sending countries²⁵ weighted by their respective shares in the country's remittances, as our instrument for remittances. As

²⁵ In Pakistan's case, the ten top remitting countries during the last three decades have been: Saudi Arabia, USA, UAE, UK, Kuwait, Oman, Bahrain, Qatar, Germany and Canada.

shown in the preceding chapter, remittances to Pakistan from various destinations are strongly influenced by economic situation of the host countries. In particular, they show a high correlation with the host economies' GDP. Nevertheless, these outputs, weighted by the respective host country's share of remittances in Pakistan's total remittance flows, need not be linked to the country's REER. Besides being intuitive, the instrument passes the required econometric tests of overidentification and weak instruments. It is highly correlated with Pakistan's remittance flows (correlation coefficient being 0.81) and is exogenous to the REER (correlation coefficient being 0.06).

Foreign Direct Investments (FDI) and foreign aid (ODA) as shares of the GDP are the other indicators of the country's private and public financial receipts. We do not include portfolio investment in our model, as portfolio inflows have stayed relatively insignificant for most of the period under study²⁶.

Following Lartey (2007, 2008), Prati and Tressel (2006), and Rajan and Subramanian (2010), we expect Dutch disease effects for development aid inflows. Foreign assistance to a developing country is often directed at the improvement of institutional and human capital as well as various infrastructure projects. Much of the resulting increase in demand falls on the non tradables, leading to higher prices and an appreciated real exchange rate. Nonetheless, these investments may foster higher productivity (especially that of the non-tradable sector relative to the tradable sector) and increased competitiveness in the long run, which may alleviate or even reverse the previously induced Dutch disease effects.

The evidence from extant literature on the Dutch disease effects of FDI is mixed. Lartey (2007) and Saborowski (2009), for instance, find Dutch disease effects for FDI, while Athukorala and Rajapatirana (2003) and Hyder and Mahboob (2006) find no evidence of real exchange rate overvaluation (appreciation) due to FDI. The competitiveness enhancing impact of FDI crucially depends on the nature of foreign investments. Investments made in export and import-competing sectors lead to improved physical and human capital, technology and technical knowledge spillovers and higher productivity, which should ultimately lead to a more competitive economy. On the other hand, if foreign investors gain

²⁶ In the studied period, portfolio investments never went above 0.02 percent of the GDP in contrast to remittances, foreign assistance and FDI which crossed 10, 7 and 4 percent of the GDP respectively.

access to domestic assets through hasty privatization and the investment amounts to little more than change of asset ownership, the investors may not care to substantially invest in the acquired assets' future, and the investments may not result in higher productivity (Mughal and Vechiu 2010). FDI may well cause the REER to appreciate in such a case.

In Pakistan, much of the FDI coming during the recent years have gone to the services sector, with finance, information and telecommunications attracting the bulk of foreign investments (SBP 2011). The country has also privatized much of the previously state owned banks and industrial corporations. The cumulative impact of these investments on the REER may well be positive.

Among the REER fundamentals, country's per capita or per worker output (taken as an indicator of productivity) control for the Balassa-Samuelson effect. The Balassa-Samuelson effect (Balassa 1964, Samuelson 1964) could develop both due to the productivity differential between the country's tradable and non-tradable sectors, as well as due to the productivity differential between the country and its trade partners. To examine the latter aspect, we take the ratio between Pakistan's and its ten principal trade partners' GDP per capita, each weighted by the country's corresponding share in Pakistan's trade, as an alternative indicator of productivity besides the standard GDP per capita variable²⁷. Following the Balassa Samuelson hypothesis, we expect a positive sign for the productivity variables. As a developing country catches up with the developed economies, the productivity of its tradable sector increases faster relative to the non-tradable sector. This leads to higher income and increased demand for the non-tradables, thus causing structural inflation. As a result, the REER moves up. This positive association has been extensively shown in the empirical literature in the context of developing countries (see for instance Choudhri and Khan, 2005; Dumrongrittikul, 2011; Lartey et al., 2008).

²⁷ Pakistan's ten major trade partner during the studied period, in descending order, are the United States, Japan, Germany, United Kingdom, Saudi Arabia, China, France, Italy, South Korea, and Malaysia.

The sign of trade openness, taken as the sum of exports and imports of the country as a share of its output²⁸, is mostly found in the literature to be negative (see for instance, Candelon et al., 2007; Edwards, 1989; Lee et al., 2008 ; Saborowski, 2009). It is mainly because opening up to international trade through lower tariff and non-tariff barriers leads to more efficient tradable sector, bringing down the relative prices of the tradables and increasing their consumption.

On the other hand, the impact of terms of trade can not be judged a priori, and depends on whether the income or the substitution effect dominates (the REER rises in the former scenario and wanes in the latter). Improved terms of trade means higher domestic income, which leads to increased spending. Spending on tradables does not cause a change in their prices (small economy hypothesis), but higher demand of non-tradables causes their prices to increase, leading to appreciation in the REER. On the other hand, cheaper imports relative to domestic non-tradables lead to higher consumption of imported goods at the cost of the non-tradables. The resulting drop in the relative prices of the non-tradables causes the REER to fall.

The net effect of government consumption is likewise ambiguous. Government expenditure in developing countries is predominantly spent on non-tradables (principally on public sector salaries), contributing to real exchange rate appreciation. On the other hand, if public spending involves a high share of imported goods, the country's trade balance is adversely affected, necessitating a depreciation in exchange rate. However, if public money is well spent on infrastructure, development and maintenance of public institutions and human capital improvement, the country's productive sectors should strengthen and the short-term appreciation in the REER should dampen in the long run. The impact of public spending on the REER can be better studied with the government spending on the non-tradables. This variable is however unavailable, and in absence, total government spending as a share of the GDP is deemed a suitable alternative (Edwards 1989, Chishti and Hassan 1993).

²⁸ The Sachs - Warner trade restriction index could serve as a better proxy, but the data for this variable are incomplete and hence, can not be considered in our study.

We take age dependency ratio as the primary indicator for demographic change. It is defined as the ratio of dependents (persons under 15 or over 65) to the working-age population. Alternatively, we use population growth rate. Both indicators put upward pressure on a developing country's real exchange rate, as the ensuing increase in demand raises the country's imports and causes a deterioration in the trade balance. A positive sign can therefore be expected for both of the indicators.

There is some evidence that monetary policy influences a country's real exchange rate, at least in the short term (Rodrik, 2008). For example, money growth, being a nominal variable, is usually not considered among the determinants of the REER. However, several studies, including Lartey et al, (2008) and Lommatzsch and Tober (2004) count it among REER's important drivers. Excess money growth puts upward pressure on prices of non-tradable goods and services, and is associated with inflationary tendencies and appreciation of the real exchange rate (Lartey et al., 2008).

Similarly, change of exchange rate regime, if not taken into account, can lead to spurious empirical results (Ball et al., 2010; Caceres and Saca, 2006; Levy-Yeyati and Sturzenegger, 2005). A fixed exchange rate regime is less able to neutralize the spending effects on the non-tradables, causing resource reallocation, ultimately leading to a higher REER (Lartey et al., 2008). As mentioned above, Pakistan followed a managed float till 1998, and after a brief transition period, officially free-floated the Rupee in 2000. We take a dummy variable to account for this de jure change in exchange regime, taking the value of one for the post-2000 period²⁹.

Recent literature has proposed natural disasters as another potentially important determinant of the REER in the developing countries (see for instance Barajas et al., 2010, Christiansen et al. 2009). A natural disaster can wipe out a developing country's productive capital, causing lower productivity. If the resulting income shock improves the country's trade balance, this can lead to a REER depreciation. On the contrary, if the country relies on foreign capital (such as foreign aid) to rebuild the damaged infrastructure or to smooth consumption, the

²⁹ For a discussion on exchange rate regimes in developing countries, see Frankel (2011).

country's REER may appreciate. Since Pakistan has occasionally suffered severe natural catastrophes, we find it appropriate to include the incidence of natural disasters as a driver of the country's real exchange rate. The disaster variable is a dummy variable which takes the value of one for a loss of 1000 or more lives, loss of \$1 billion or 1 million casualties in any given year³⁰. In our studied period, six years (1992, 1996, 1998, 1999, 2005 and 2007) meet the above criteria, either due to severe flooding or the 7.6 magnitude earthquake in 2005.

We consider the period from 1980 to 2008 in the annual, and from July 2001 to March 2009 for the monthly analysis. Therefore, we work with 29 yearly and 93 monthly observations. Data for remittances and FDI have been provided by the State Bank of Pakistan, the dependency ratio is taken from the World Bank WDI database, data for our the disaster dummy come from Université Catholique de Louvain's EM-DAT Disaster Database, whereas the remaining variables come from the IFS online database.

Before describing the results, we first briefly mention the technique used in the study.

C. The Bayesian paradigm:

The Bayesian analysis provides the benefits of exact sample results, integration of decision-making, 'estimation', 'testing', and model selection, and a full accounting of uncertainty (Rossi et al., 2005). It is a rational framework which models all the inputs, implying that the parameters are considered as variables. Taking the unobservable information into account in this way can improve the quality of the estimations and forecasts (Parent and Bernier, 2007). The Bayesian approach draws heavily on the probability theory and takes account of prior information to generate the distribution of observables conditional on the data and the prior.

We use the Bayesian Instrumental Variable method to control for endogeneity. We estimate the parameters of the above equation, so our model can be written as

³⁰ We take this arbitrary definition keeping in view the area, population and economic size of the country. Relaxing the definition of number of dead to 500 adds another year. Considering monetary losses of at least \$100 million adds yet another two years.

$$\begin{cases} REMIT = \delta PIBH + \varepsilon_1 \\ REER = \beta REMIT + X \gamma_i + \varepsilon_2 \quad i = 1, \dots, 8 \\ (\varepsilon_1, \varepsilon_2) \sim N(0, \sigma) \end{cases}$$

Where:

X is the matrix of explanatory variables defined in the following subsection. $PIBH$ is the instrument for remittances.

The Bayesian approach requires the specification of prior distribution. The prior can be specified as follows:

$$\delta \sim N(m_\delta, A_\delta^{-1}), \quad (\beta, \gamma) \sim N(m_{\beta\gamma}, A_{\beta\gamma}^{-1}) \text{ and } \sigma \sim IW(\eta, V)$$

(The prior values are given in parentheses)

m_δ : prior mean (0)

A_δ : pds prior precision (0.01)

$m_{\beta\gamma}$: prior mean vector for prior on β, γ (0)

$A_{\beta\gamma}$: pds prior prec for prior on β, γ (0.01)

η : d.f. parm for IW prior on σ (5)

V : pds location matrix for IW prior on Sigma (0)

There are several types of priors. We use the non informative prior (also called flat prior), giving the mean a value 0. A prior distribution is considered noninformative if its impact on the posterior distribution of θ is minimal.

The results of Bayesian analysis are shown in the form of moments of marginal distributions of the parameters (such as the posterior mean and posterior standard deviation). These are the OLS analogues of parameter coefficients and standard errors. To calculate the posterior mean, we apply the Markov Chain Monte Carlo (MCMC) method using the Gibbs algorithm. Monte Carlo is a method of investigating the behaviour of economic models which are too complicated for analytical solutions to be possible.

A system is started off at a large number of initial positions chosen at random, and followed through a numerical simulation using a sequence of random variables generated using a Markov chain. For the purpose of our study, we use Gibbs sampler, a widely used MCMC

method, which provides an accurate estimation of the marginal posterior densities (Parent and Bernier, 2007)³¹.

3.2.3 Remittances and Dutch disease - Spending effect

A. *Annual REER model*

Table 3.2.2. IV annual REER determinants

	Mean	SD			
Intercept	-0.660	8.291			
Rem	0.29	0.27			
Open	-0.272	0.825			
TOT	-0.226	0.615			
GOV	-0.339	0.451			
GDPpcw	-0.461	0.741			
Pop	2.814	2.104			
ODA	-0.051	0.158			
FDI	0.014	0.153			
Moneygrowth	-0.004	0.009			
Exchange rate regime	-0.068	0.378			
Disaster	0.036	0.155			
Quantiles					
	2.5%	5%	50%	95%	97.5%
Intercepte	-17.340	-14.655	-0.618	13.077	15.667
Rem	-0.23	-0.12	0.28	0.74	0.87
Open	-1.885	-1.594	-0.283	1.073	1.327
TOT	-1.449	-1.241	-0.228	0.769	0.927
GOV	-1.207	-1.055	-0.360	0.424	0.587
GDPpcw	-1.942	-1.683	-0.466	0.763	0.965

³¹ The annual and monthly estimations are made using the R Bayesm and MCMCpack packages respectively, the latter solves the linear model whereas the former finds the posterior marginal distribution.

Pop	-1.460	-0.585	2.790	6.190	6.901
ODA	-0.373	-0.321	-0.047	0.203	0.266
FDI	-0.293	-0.231	0.014	0.266	0.319
Moneygrowth	-0.022	-0.020	-0.004	0.012	0.014
Exchange regim	-0.816	-0.705	-0.069	0.542	0.653
Disaster	-0.285	-0.225	0.040	0.281	0.323

The findings given in Table 3.2.2 show that remittances parameter has a positive marginal posterior mean, the posterior mean being +0.29. In other words, a doubling of migrant remittances (as a share of GDP) leads to a real exchange rate appreciation of 29%. A look at the quantiles with three quantiles showing a positive sign confirms the positive (though moderate) nature of the remittances posteriors. Moreover, if the baseline equation is repeated without the remittance instrument, the marginal mean drops to 0.27 which signifies that the impact of remittances is underestimated if endogeneity is not taken into consideration.

FDI and ODA show a positive and negative sign respectively, both showing a relatively weak mean value. Their impact seems marginal as compared to that of foreign remittances. The dependency ratio and disaster dummy exhibit positive signs, while the remaining variables show negative signs. Age dependency ratio has by far the strongest impact of all the variables in the model. The same model is alternatively estimated using GDP per capita as the productivity indicator, and does not alter our results (Table A3.2).

In terms of region-wise impacts (Table 3.2.3), remittances from the Persian Gulf show a strong positive impact. A 1 % growth in remittances from the Gulf as a share of GDP is associated with 0.35 % appreciation of the REER. Remittances from North America and Europe, however, do not appear to be associated with REER appreciation. Remittances from Europe have a negligible impact, while those from North America show a small negative relationship. Both the Gulf and North American remittances have robust signs maintained through out the distribution.

Table 3.2.3. Annual REER determinants (region-wise)

	Mean	SD				
Intercept	-0.595	3.943				
Open	-0.053	0.288				
TOT	-0.268	0.160				
GOV	-0.356	0.127				
Gdppcw	-0.078	0.220				
Pop	1.836	0.913				
ODA	0.002	0.046				
FDI	0.062	0.043				
ME	0.350	0.089				
Europe	-0.004	0.105				
America	-0.109	0.048				
Disaster	0.0001	0.040				
Exchange rate regime	-0.047	0.125				
Quantiles						
	2.5%	25%	50%	75%	97.5%	
Intercept	-8.341	-3.126	-0.661	1.936	7.254	
Open	-0.620	-0.241	-0.052	0.128	0.531	
TOT	-0.586	-0.370	-0.268	-0.164	0.048	
GOV	-0.610	-0.439	-0.356	-0.275	-0.103	
Gdppcw	-0.518	-0.218	-0.804	0.065	0.361	
Pop	0.025	1.244	1.848	2.429	3.595	
ODA	-0.091	-0.027	2.686	0.032	0.092	
FDI	-0.024	0.035	6.276	0.090	0.151	
ME	0.170	0.293	3.502	0.408	0.529	
Europe	-0.212	-0.073	-4.481	0.061	0.206	

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America	-0.206	-0.140	-1.097	-0.078	-0.014
Disaster	-0.079	-0.025	6.262	0.026	0.079
Exchange.rate	-0.301	-0.127	-4.824	0.034	0.197

B. Monthly REER model

The REER lifting effect of remittances is confirmed using the monthly data (Table 3.2.4). Remittances and FDI respectively show positive and negative marginal mean values. Exports and imports have intuitive negative and positive marginal means. The region-wise impacts of remittances (Table 3.2.5) are similar for Europe. However, remittances from the Persian Gulf appear to negatively interact with the REER. This contradicts the Dutch disease effects found with the annual series. The reason may lie in the difference in the length of the time periods examined in the two cases. The monthly results pertain to 93 monthly observations of the 2000s. During this decade, remittances from The GCC countries have grown almost every year, in both absolute and relative terms. The monthly results are much weaker than the annual ones.

This notwithstanding, if indeed remittances from the Middle East have had no Dutch disease-causing effect during the 2000s, this should portend well for the economy, given the ongoing substantial flows of remittances from the Gulf states.

Table 3.2.4. Monthly REER determinants

	Mean	SD			
Intercept	4.759	0.165			
Rems	0.021	0.011			
FDI	0.005	0.004			
Exports	-0.086	0.028			
Imports	0.057	0.018			
Money growth	-0.170	0.058			
Quantiles					
	2.5%	25%	50%	75%	97.5%
Intercept	4.437	4.647	4.760	4.870	5.084
Rem	-0.0003	0.014	0.021	0.029	0.043
FDI	-0.003	0.002	0.005	0.008	0.014
Exports	-0.141	-0.105	-0.087	-0.068	-0.03
Imports	0.021	0.045	0.057	0.069	0.094
Money growth	-0.285	-0.209	-0.170	-0.131	-0.054

Table 3.2.5. Monthly REER determinants (region-wise)

	Mean	SD			
Intercept	4.662	0.184			
Asia	-0.038	0.012			
Europ	-0.001	0.015			
America	0.010	0.007			
FDI	0.009	0.004			
Exports	-0.069	0.027			
Imports	0.072	0.019			
Money growth	-0.136	0.056			
Quantiles					
	2.5%	25%	50%	75%	97.5%
Intercept	4.308	4.537	4.660	4.782	5.026
Asia	-0.064	-0.047	-0.038	-0.03	-0.013
Europ	-0.031	-0.011	-0.001	0.008	0.028

America	-0.004	0.005	0.010	0.015	0.025
FDI	0.001	0.006	0.009	0.012	0.017
Exports	-0.124	-0.088	-0.069	-0.051	-0.016
Imports	0.034	0.059	0.072	0.085	0.110
Money growth	-0.248	-0.174	-0.136	-0.098	-0.027

Here, a caveat needs to be mentioned: Even though the REER appreciating effects of remittances found in this study are unambiguous and stronger than those found in earlier studies on Pakistani remittances (section 3.2.1), the effects found over all, are relatively mild (They are just a fraction of the impact exerted by demographic factors, for instance). This may owe to the strong relationship with domestic savings that remittances to Pakistan exhibit (Mughal and Diawara, 2010). Part of the savings that remittances generate goes to the tradable sector, thus limiting the loss to the sector through other channels. Similarly, some of the remittances consumed are spent on imported goods, pushing down the real exchange rate (the positive correlation between remittances and imports (figure 3.2.2) is a case in point).

Official development assistance, on the contrary, does not appear to have a damaging impact on the country's exchange rate. This could be due to the fact that these inflows, being official transfers, are not spent in the same way as remittances. Our results provide evidence to the argument that despite wastage of development funds due to bureaucratic red-tape, corruption, and lack of spending capacity, ODA has improved the country's real exchange rate. This is hardly surprising given the fact that foreign assistance is often directed at infrastructure development and provision of public service projects with high social and economic returns in developing countries, adding to the local economy's productive capacity. Aid also puts upward pressure on a country's imports, and keeps the real exchange from rising in the long run³².

FDI shows mixed signs of Dutch disease inducing effects (the correlation with the REER is positive in the annual and negative in the monthly model). This divergence may be due to the

³² See for instance, Tressel et al. (2009) and Torvik (2001) for more on the latter argument.

remarkably high levels of foreign investment in the 2000s that reflect disproportionately in the monthly results. FDI remained under \$1 billion till 2003, but rose sharply then onwards to cross \$5.4 billion in 2008.

The effect of FDI on the REER, however, appears to be much weaker than those of the remittances. This can be gauged from the sectoral distribution of these inflows. Foreign investments in Pakistan have involved both services and industrial sectors. FDI to Pakistan has been either in the form of acquisitions of private local concerns (e.g. banks, food and beverage companies) and nationalized corporations, or domestic-consumption-related investments. Oil and gas exploration, fossil-fuel based power plants, communications and financial services together comprised 72 percent of foreign investments in Pakistan during the period from 2001 to 2009 (SBP 2011).

Among other determinants of REER, terms of trade and trade openness both show a negative correlation with the real exchange rate. In the case of trade openness, the result is expected, and corroborates the evidence generally found in the literature. The negative sign for terms of trade implies that rapid deterioration of terms of trade in the recent years has pushed the real exchange rate upwards³³. The strong relationship between REER and age dependency ratio highlights the important role demographic change is playing in the developing countries. The negligible mean value of money supply growth indicates that this nominal variable plays no role in the medium to long run. The exchange regime dummy shows a negative sign, meaning that Pakistan's adoption of flexible exchange rate regime has made the country's exchange rate more competitive. The disaster dummy shows a small positive impact, which may point to the fact natural disasters in Pakistan have generally followed a surge of remittances and official development assistance.

Another notable finding is the lack of support of the Balassa Samuelson hypothesis. This apparently counterintuitive result has been discussed in previous studies such as Rogoff (1996). Dumrongrittikul (2011) also find evidence of real exchange rate depreciation among relatively rapidly growing developing countries.

³³ After remaining above 100 throughout the 1980s and 1990s, the country's terms of trade sharply fell from 90 in 2001 to 55 in 2008.

The results so far have confirmed spending effect symptoms of the Dutch disease. We also have some indications of the gradual erosion of competitiveness of Pakistan's export sector (figure 3.2.2). In the next subsection, we study the resource movement aspect of the Dutch disease.

Remittances and Dutch disease - Resource reallocation effect

In this subsection, we analyze the impact of remittances on the reallocation of resources between the tradable and non-tradable sectors. This helps distinguish the resource movement effect of remittances from their spending effect (Lartey et al., 2008). The rising spending power of remittances-receiving households that increases the relative demand for services raises the price level of the non-tradable sector. This leads labour and capital movement towards the non-tradable sector at the cost of tradable goods sector, resulting in the loss of export competitiveness. A clear negative relationship will therefore confirm our hypothesis that in Pakistan, remittances have added to the loss of competitiveness of the major exports through resource movement towards the production of non-tradable goods and services.

Table 3.2.6. Remittances and tradable - non-tradable (TNT) sector resource reallocation

	Mean	SD			
Intercept	5.849	2.890			
Open	0.175	0.108			
TOT	-0.080	0.073			
GOV	-0.039	0.070			
GDPpcp	-0.616	0.209			
Pop	-0.456	0.453			
ODA	0.009	0.023			
FDI	-0.009	0.021			
Rem	-0.059	0.029			
Exchange.rate	-0.098	0.057			
Disaster	0.016	0.020			
Quantiles					
	2.5%	25%	50%	75%	97.5%
Intercept	0.255	3.941	5.825	7.717	11.560
Open	-0.042	0.106	0.175	0.245	0.391
TOT	-0.231	-0.127	-0.077	-0.03	0.066
GOV	-0.177	-0.085	-0.040	0.005	0.100
GDPpcp	-1.041	-0.752	-0.615	-0.480	-0.209
Pop	-1.343	-0.752	-0.456	-0.155	0.441
ODA	-0.035	-0.004	0.009	0.025	0.055
FDI	-0.053	-0.023	-0.009	0.004	0.033
Rem	-0.117	-0.078	-0.059	-0.040	-0.001
Exchange.rate	-0.214	-0.135	-0.097	-0.059	0.015
Disaster	-0.024	0.002	0.016	0.029	0.057

Table 3.2.6 shows the findings of estimation using the tradable to non-tradable (TNT) ratio as the explained variable. As expected, remittances have a negative average impact on the sectoral output decomposition. However, its impact (marginal posterior mean = -0.06), is

much smaller than those of trade openness, productivity, or the demographic change³⁴. This behaviour of remittances (strong REER appreciation coupled with a weak relative tradable to non-tradable output.) corroborates the findings of Sosa and Magud (2010).

We further probe this question by reconstructing our tradable to non-tradable ratio by redefining the tradable and non-tradable sectors using disaggregated data. Agricultural and industrial goods and services which Pakistan has generally not traded in the last three decades are excluded from the list of tradables. We treat industrial subsectors of slaughtering, construction and electricity and gas distribution, and the agricultural subsector of forestry as non-tradables. The series slightly differs from the original one, with a partial correlation of 0.95. Results using this reconstructed series (shown in Table 3.2.7) confirm the weak nature of correlation between remittances and sectoral resource movement. A 100 % increase in remittances causes less than 1 % change in the tradable to non-tradable ratio.

³⁴ Lartey et al. (2008), in contrast, find a sizeable 1 percent drop in the tradable to non-tradable ratio for every 1 percent remittances to GDP increase.

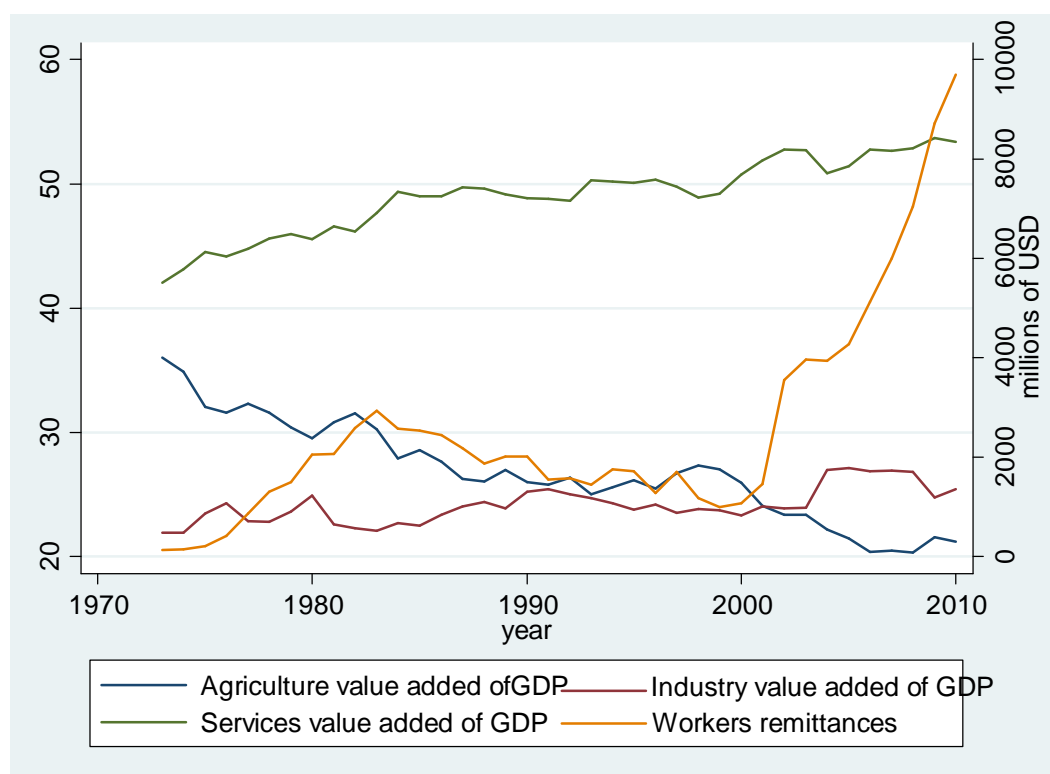
Table 3.2.7. Remittances and tradable to non-tradable (TNT) sector resource reallocation

	<u>(Reconstructed series)</u>				
	Mean	SD			
(Intercept)	4.592	2.483			
Open	0.040	0.093			
TOT	-0.130	0.063			
GOV	-0.042	0.060			
GDPpcp	-0.379	0.179			
Pop	-0.425	0.389			
ODA	-0.006	0.019			
FDI	-0.016	0.018			
Rem	0.0006	0.025			
Exchange					
rate regime	-0.156	0.049			
disaster	0.006	0.017			
2. Quantiles for each variable:					
	2.5%	25%	50%	75%	97.5%
(Intercept)	-0.215	2.952	4.571	6.196	9.499
Open	-0.146	-0.019	0.040	0.100	0.225
TOT	-0.260	-0.171	-0.130	-0.090	-0.004
GOV	-0.161	-0.081	-0.043	-0.004	0.077
GDPpcp	-0.744	-0.495	-0.378	-0.262	-0.029
Pop	-1.187	-0.679	-0.425	-0.166	0.346
ODA	-0.045	-0.019	-0.006	0.006	0.032
FDI	-0.054	-0.028	-0.016	-0.004	0.020
Rem	-0.049	-0.015	0.0005	0.016	0.050
Exchange					
rate regime	-0.256	-0.188	-0.156	-0.123	-0.058
Disaster	-0.028	-0.004	0.006	0.018	0.042

Pakistan's economic structure has evolved in the last three decades, with an increasingly important role of services at the cost of the share of the agricultural sector³⁵. Remittances also seem to be among the contributors to this trend. This point is borne out by the Kernel density estimation shown in figure 3.2.3. Remittances are positively correlated with the country's services sector during the studied period, whereas the tradable sector, comprising industry and agriculture, seems to be negatively associated. A rise in remittance inflows has pushed up the weight of non-tradable sector in the economy at the cost of industry and agriculture. However, it must be noted that agriculture shows the expected negative relationship, whereas the association with industry comes out to be positive. A possible reason for this can be that industry has over the years benefited from the increase in demand for manufactured goods as a result of remittance receiving households' rising purchasing power. Moreover, remittances have sometimes financed small and medium industrial startups, whereas remittance receiving households are often known to neglect or abandon agriculture. This last result nevertheless requires further investigation and is left for future research.

³⁵ The share of services in the national production rose from 45 percent in 1980 to 54 percent in 2009, whereas that of agriculture dropped by a equal 9 percent to 20 percent from the previous 29 percent.

Figure 3.2.3. Relationship between remittances and sectoral output shares (Kernel density estimation)



Source: authors' calculations based on WB Online 'World Development Indicators'.

On the other hand, FDI shows a small but helpful influence on the non-tradables' sector. The weak impact of FDI on the TNT ratio points to the diverse nature of foreign investments made in the country, ranging from bank acquisitions to fertilizers and pharmaceuticals. FDI, therefore, exhibit neither a clear spending nor the resource movement effect of the Dutch disease. However, lack of real exchange rate depreciation effect suggests that the flows of FDI that accelerated in the 2000s have apparently not improve the country's competitiveness, and the purported benefits of FDIs have not materialized.

Among other findings, the productivity indicator shows a negative relationship with the structural shift ratio. The gradual strengthening of the services sector, mostly at the cost of the agricultural sector, is a common sight in the developing economies. The negative sign of government spending also underscores this point. In Pakistan, much of the federal budget has historically gone on debt servicing, defence, pays and perks of government employees, and

provision of education and health services. This confirms the expenditure bias towards non-tradable goods shown in the literature (see for instance, Bergstrand, 1991).

Table 3.2.8. Region-wise remittances and tradable to non-tradable ratio

	Mean	SD			
Intercept	7.424	2.989			
Open	-0.037	0.123			
TOT	-0.056	0.066			
GOV	-0.065	0.074			
GDPpcp	-0.537	0.236			
Pop	-0.739	0.448			
ODA	-0.013	0.021			
FDI	-0.022	0.018			
ME	-0.124	0.039			
Europe	0.128	0.046			
America	-0.035	0.020			
Exchange.rate	-0.125	0.050			
Disaster	0.026	0.017			
Quantiles					
	2.5%	25%	50%	75%	97.5%
Intercept	1.552	5.506	7.411	9.345	13.376
Open	-0.280	-0.119	-0.039	0.041	0.211
TOT	-0.189	-0.099	-0.056	-0.013	0.075
GOV	-0.210	-0.114	-0.065	-0.018	0.080
GDPpcp	-1.021	-0.684	-0.536	-0.385	-0.062
Pop	-1.629	-1.029	-0.733	-0.447	0.126
ODA	-0.057	-0.027	-0.013	0.00009	0.028
FDI	-0.059	-0.034	-0.022	-0.010	0.015
ME	-0.203	-0.149	-0.124	-0.098	-0.046
Europe	0.036	0.098	0.128	0.158	0.222
America	-0.076	-0.048	-0.035	-0.223	0.006
Exchange.rate	-0.226	-0.158	-0.125	-9.308	-0.025

The positive sign for the trade openness is intuitive, and supports the broad agreement in the literature on the productivity-enhancing impacts of trade liberalization. In terms of region-

wise impact (Table 3.2.8), remittances from the Persian Gulf and North America both show negative signs. This confirms the anecdotal evidence of remittances financing the real estate boom in the country (Oda 2009).

Conclusions and policy implications

The above analysis illustrates that the Pakistani economy exhibits symptoms of the Dutch disease as a result of the remittance inflows. Their impact on the country's competitiveness appears to be detrimental, even though many households benefit directly from them. The results lend credence to the idea that remittances have, over the years, caused a gradual (though small) shift in resource allocation through consumption of non-tradable goods and services. The phenomenal rise in real-estate and housing (two important expenditures of the overseas Pakistanis) points in this direction. A significant spending effect coupled with a weak resource movement one indicates a higher emphasis on non-tradable goods and services. This additional demand for non tradable goods and services has pushed up the price level and made local production relatively expensive. The net effect is that the country's exports have become relatively less competitive in the foreign markets and the imports have become more attractive. Our findings also corroborate the analysis of macroeconomic drivers of remittances in the previous chapter. Remittances for investment motive are surmised to be pro-cyclical and inducing symptoms of Dutch disease (see also Combes et al. 2011).

The harmful effects of remittances on the country's competitiveness are opposite to what we find for FDI and official development assistance. The real exchange rate appreciating effect of remittances is more significant than the one caused by other financial flows because unlike foreign capital inflows, remittances are the outcome of a gradually developing social process (that of migration), and are not prone to sudden stops or reversals. Therefore, their REER affecting tendency can be dealt only partially through temporary monetary and fiscal measures. The loss in external competitiveness, in this case, needs to be remediated through improvements in internal competitiveness. More attention is required for channelling remittances towards productive avenues. In the absence of adequate investment opportunities, much of the remittances are spent on conspicuous consumption. By providing investment schemes for overseas Pakistanis, and promoting small-scale enterprises, these remittances can be harnessed in a way that improves the country's productivity. Development of the financial sector is also necessary. Higher financial literacy, a culture of bank deposits and easier and

less costly access to banking services can be useful in this regard. In terms of macroeconomic adjustment, the country needs to rethink its monetary policy in light of the increasing importance of remittance receipts. As demonstrated by Chami et al. (2006), a country's optimal monetary policy for a remittance-dependent economy is different from the one for an economy with no significant remittances. The competitiveness-affecting impact of remittances can be further controlled through judicious use of fiscal policy. Improving labour productivity through skill enhancement programs and making the taxation regime leaner and more transparent can be steps towards this goal.

3.3 REMITTANCES AND LABOUR SUPPLY

3.3.1 Introduction³⁶

Remittances can also impact a country's competitiveness through the channel of labour market. This channel has been sparsely studied in the case of Pakistan, despite the fact that the country is one of the largest migrant-sending and remittance-receiving countries in the world (World Bank 2011). In an earlier study on the urban areas, Kozelt and Alderman (1990) found a negative impact of remittances on male labour participation in Pakistan. The nature of migration and remittance flows to Pakistan has greatly evolved in the last two decades.

Pakistani migrant community has significantly diversified, with North America and Europe emerging as two other important destinations besides the established Pakistan - Persian Gulf corridor. Furthermore, the importance of skilled migration has grown (Kock and Sun 2011). This makes it important to analyse the labour effects of remittances. This study is an attempt in this regard. In this section, we study the impact of foreign as well as more numerous internal remittances on the participation and supply of labour using a recent representative household economic survey. Our analysis mainly focuses on four questions:

³⁶ A version of this section was presented at the 46th annual conference of the Canadian Economic Association held at Calgary from 7th to 10th June, 2012. We thank the discussant and participants of the session for discussion and useful comments on the presentation.

1. Is the labour participation behaviour of remittance-receiving households different from their non-receiving counterparts? We find that foreign remittance recipients do have lower labour participation rates than non-recipients.
2. If so, what activities do the non-labour participant remittance-recipients pursue? We examine the relationship of remittances with willingness to work and education enrollment of the members from recipient households. We find no significant difference in the likelihood of looking to work between recipients and non-recipients. However, there is some evidence of an increase in middle school enrollment among the remittance recipients.
3. Do workers modify the quantity of labour supply with the receipt of transfers? We find no significant change in the labour quantity supplied (in terms of months worked during the preceding year and number of days worked during the preceding month) between the remittance receiving and non-receiving individuals.
4. Does the receipt of remittances modify the likelihood of participation in a particular type of work activity? We examine the association of remittances with the probability of being self-employed, paid employee and own cultivator, and find a positive association of foreign and internal remittances with non-agricultural self-employment and self-cultivation respectively.

The labour effect of remittances from migrants abroad is not bound to be identical to the one of internal remittances. A contribution of this work is that the same four questions are investigated for both kinds of transfers, and the results of the two comparatively analyzed. The rest of the study is organized as follows: The next subsection describes some salient features of remittance-receiving households and their interaction with the labour market. A brief review of theoretical and empirical literature follows in subsection 3.3.3. Subsection 3.3.4 explains the empirical strategy and introduces the data set used. Key findings on the four questions studied are presented and discussed in subsection 3.3.5. Subsection 6 concludes.

Table 3.3.1. Labour characteristics of remittance-receiving
households

(%)	Foreign remittances	Internal remittances
Worker Of Age 15 Or Above	24	30.238
Worker Between The Age Of 15 And 25	21.111	20
Worker Between The Age Of 26 And 50	28.125	45.323
Worker Between The Age Of 51 And 65	30	32.876
Male Worker	51.190	56.097
Female Worker	4.347	13.779
Worker Age 15 Or Above In Urban Area	23.287	30.128
Worker Age 15 Or Above Working In Rural Area	24.409	30.303
Job status – Self- Employed (Non- Agricultural)	22	14.960
Job status- Paid Employee	46	53.543
Job status- own- cultivator	8	7.04
Highest education level – No schooling	0	1.18
Highest education level – Primary	32.61	28.24
Highest education level – Middle	16.30	20
Highest education level – Secondary	40.22	37.65
Highest education level – University	10.87	12.94

3.3.2 Remittances and labour supply : some stylized facts

Migration is a widespread phenomenon in Pakistan. More than one in four households in the rural areas report at least one migrant (Mansuri 2007), and almost two-thirds of those migrants send remittances to their households. According to the more representative household integrated economic survey 2007-08 used for our analysis, about 4.3% of Pakistani households report receiving transfers from abroad, while 8.3% receive internal remittances. More rural households receive foreign and domestic remittances (5.3% and 10.1%) than the urban households do (3.6% and 6.7% respectively). Fewer persons aged 15 or more from foreign remittance-receiving households report having worked during the month prior to the survey (24%) compared to those from non-receiving ones (47%). The corresponding figures for internal remittance recipients are 30% and 46% respectively (table 3.3.1). Labour participation rates among females from foreign remittance recipient households are substantially below the over all female average 4% compared to 16%). The participation rate of women from internal remittance-receiving households, is, however, little different from the average (13.7%). Rural areas have generally higher labour participation rates than urban areas.

Over half the respondents considered to be at work (54%) report working as paid employees, other major job categories being unpaid family work, non-agricultural self-employment and self-cultivation. The prevalence of own-account work is higher among individuals from foreign remittance-receiving households than the internal remittance receiving ones. On the whole, about three quarter of Pakistan's work is in the informal sector, and almost half of the work force (45%) is employed in agriculture or allied sectors (Labour Force Survey 2010-11). Besides, 6% of working age population is unemployed, the unemployment phenomenon being mainly concentrated in the urban areas (Labour Force Survey 2010-11).

3.3.3 Theoretical and Empirical Underpinnings

In the neoclassical theory of labour supply, individuals provide labour for market and non-market activities according to the incentives and budget constraints they face. These budget constraints are determined, in part, by the non-labour income available to the individual. The income earned by other members of the household acts as a source of non-labour income for an individual. Given the assumption that leisure is a normal good, an increase in non-labour income decreases the opportunity cost of leisure and raises the reservation wage of the worker (Killingsworth 1983). If the reservation wage of the individual is higher than the prevailing market wage, the individual will choose to withdraw from the labour market (Disincentive effect).

A large body of literature has investigated the effects of non-labour income. For instance, Imbens et al. (2001) in case of lottery wins and Bertrand et al. (2003) in case of pension payments find evidence of disincentive effect of non-labour income, whereas Joulfaian and Wilhelm (1994) find no negative effect of inheritance on labour participation.

Remittances are also a form of non-labour income for the remaining migrant household members. Remittances raise the household's reservation wages and therefore make the labour participation of the household members less likely. The members prefer to consume more leisure (Rodriguez and Tiongson 2001) or allocate more time to household production. The latter effect, called labour substitution, implies an increased production and consumption of non-market goods such as childcare. The departure of the migrant raises the marginal productivity of household work of the remaining household members (Cahuc and Zylberberg, 2004). Receipt of transfers reduces the shadow value of the market wage of the staying behind household members, and allows them to allocate more time for household activities (Acosta 2011). This leads to a higher intra-household specialization where the migrant takes up the responsibility of providing for the household's financial needs and the remaining members (especially the women) specializing in homemaking (Hanson 2007a). The disincentive effect should be greater among the women members of the developing country migrant households due to generally high number of dependents at home.

Remittances, through their disincentive effects, can cause moral hazard problems (Chami et al 2005), making the households lazy (Azam and Gubert 2006) and dependent on money transfers from abroad (Kapur 2005). This notwithstanding, the effects of migration and remittances on the domestic labour market are by no means invariably negative. Remittances alleviate the household members' budget and credit constraints, and make it possible to invest in more profitable or risky ventures. This can increase the household's labour supply and can also cause a change in activity and job status of the worker.

Better financial conditions also allow the households to invest in its human capital and keep the young members out of the labour market (McKenzie and Rapoport 2011, Stark et al. 1997). Besides, the incentives for higher education attainment are stronger among remittance-receiving households due to the household's better access to foreign labour markets, where returns to university education are higher.

Given the ambiguous and contradictory nature of effects of remittances on the labour market, the question is ultimately an empirical one. In an early study of the question, Funkhouser (1992) found negative relationship between foreign remittances to Nicaragua and labour participation of the receiving households. The labour participation drops by 2.1 percent for males and 5 percent for females for every hundred dollars transferred from abroad.

Similarly Görlich et al. (2007), Gubert (2002), Jadotte (2009), and Justino and Shemyakina (2010) bring evidence of negative participation effects of remittances from Moldova, Mali, Haiti and post-conflict Tajikistan respectively. Some studies, however, find no significant impact of remittances on labour supply (Funkhouser 2006, Yang 2008). Damon (2009) using a panel survey even finds an increase in labour supply in rural El Salvador.

Amuedo-Dorantes and Pozo (2006a) find that remittances to Mexico reduce formal sector employment among both males and females, whereas informal sector labour participation rises among the males. Other studies which find negative labour participation effects for women include Acosta (2011), Cabejin (2006), Lokshin and Glinskaya (2009), Hanson (2007b), and Mendola and Carletto (2009). On the other hand, Justino and Shemyakina (2010) find the intriguing result that the negative effect of remittances on labour supply is smaller for women than for men, a finding they explain in the context of Tajikistan's social conflict.

Another interesting question is what the migrant households do when they decrease their labour supply. Görlich et al. (2007) find that migrant households are more likely to be involved in home production activities and university education, whereas Rodriguez and Tiangson (2001) consider leisure to be the important activity for migrant households.

Several studies, such as Calero et al. (2009) on Ecuador, Hanson and Woodruff (2003) on Mexico, Cox Edwards and Ureta (2003) on El Salvador, and Mansuri (2006) on Pakistan show positive impact of remittances and migration on child education. In contrast, Acosta (2011) find no difference between the levels of investment in human capital of remittance receiving and non-recipient households, while McKenzie and Rapoport (2011) 7 and McKenzie (2005) indicate that migration might even discourage investment in education.

Foreign remittances are also found to generate and promote self-employment among recipient households (Funkhouser 1992, Woodruff and Zenteno 2007). Brown and Leevs (2007) observe an increase in self-employment and farming, and a drop in wage employment and subsistence agriculture in Fiji and Tonga as a result of remittances. In contrast, Amuedo-Dorantes and Pozo (2006b), in their study of remittance effects on the Dominican Republic's economy, find a drop in entrepreneurial activities among recipient households.

3.3.4 Empirical Methodology

A. Data description

Data for this study come from the Household Integrated Economic Survey 2007-08 (HIES) conducted by the government of Pakistan. This is a representative survey comprising observations for 15512 households. The dataset contains several variables pertaining to the incidence and quantity of labour supplied by the households. Definitions and summary statistics of these and other variables used in our analysis are given in table 3.3.2. We add various individual, household and location indicators to control for the socioeconomic situation of the individuals. Our baseline model studies the likelihood of the person working, where work refers to the dichotomous variable taking the value of 1 if the person of age 15 or above has worked for profit for at least one hour during the month prior to the survey. Age (in complete years) and gender of the person are taken to control for individual features of the member of the household. Among the household variables, the number of dependents in the

household (persons below 18 and over 65 years of age), the number of male adults and a binary variable for female headship control for the household's demographic conditions. Besides, we construct the variable "highest class passed" to reflect the education level of the household. It is a categorical variable taking the value of zero for no education for any household member, one for primary school (grade 1 to 5), two for middle school (grade 6 to 8), three for high school (grade 9 to 12) and four for university education. The monetary value of the household's savings (in natural log) is taken as a proxy for the household wealth. Finally, two geographical variables are included, one standing for the household's residence in rural or urban area, while the other reflecting its residence in one of the country's four provinces (Punjab, Khyber Pakhtunkhwa, Sindh and Balochistan).

Table 3.3.2. Summary Statistics of the dataset

Variables	Description	Obs	%
Forrem	Remittances received in cash from abroad	8136	4,31%
Intrem	Remittances received in cash from inside Pakistan	9118	8,38%
W15	Did the person of 15 years or above work for at least one hour for profit during the last month?	63936	45,2%
status3	Self-employed (non-agricultural)	30092	11%
status4	Paid employee	30092	54,3%
status6	Own-cultivator	30092	7,41%
malework	Working man (15 year or above)	31872	74%
femwork	Working woman (15 year or above)	31957	16,7%
Wurban	Urban working person (age 15 or above)	26507	41,2%
wrural	Rural working person (age 15 or above)	37429	48,1%
work1525	Age group: workers below 25 years	24537	37,2%
work2650	Age group: 26 - 50 years	27337	56%
work5165	Age group: 51 - 65 years	8744	44,4%

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seek15	Person out of work unwilling to seek work	34954	96,8%
seek15male	Man out of work unwilling to seek work	8293	92,5%
seek15female	Woman out of work unwilling to seek work	26624	98,1%
sex	Sex (0 for female, 1 for male)	107832	50,4%
Femalehead	Is the head of the household a female?	124835	1,19%
Highestclasspassed1			
	Highest class attained (household) - Primary	28650	32,251%
Highestclasspassed2			
	Highest class attained (household) - Middle	28650	19,494%
Highestclasspassed 3			
	Highest class attained (household) – Secondary	28650	35,623%
Highestclasspassed 4			
	Highest class attained (household) – University	28650	12,251%
curr2	Current enrollment : primary school	26437	52,5%
curr3	Current enrollment : middle school	26437	17,4%
curr4	Current enrollment : secondary school	26437	15,2%
curr5	Current enrollment: university	26437	5,59%
region	region of residence (0 for rural area, 1 for urban area)	108469	39,1%
Province 1	Punjab	108469	39,733%
Province 2	Khyber Pakhtunkhwa	108469	23,67%
Province 3	Sindh	108469	20,823%
Province 4	Balochistan	108469	15,774%

B. Methodology

We rely on Probit and Propensity Score Matching (PSM) techniques for most of our estimations. Probit provides us with a simple inference on the sign and significance of the relationship between the receipt of foreign and internal remittances on the one hand and labour participation of the household members on the other. However, it fails to deal with the potential self-selection problem. Remittance-receiving households may not be randomly selected, and may differ from non-migrant households in such characteristics as motivation to work, ability and skills (Cobb-Clark 1993). These unobserved and unobserved features might

not only influence a household's likelihood of receiving remittances, but could also affect the household members' decision to participate in the labour market (Görlich et al 2007)

The use of Propensity Score Matching is useful for handling such potential non-randomness of migrant households. The method consist of matching persons from remittance-receiving households with those from non-remittance-receiving ones with similar observable characteristics (number of dependents in the household, female headship, highest education level attained by a member of the household, savings, urban orr rural setting, and province of residence). First, the probability of receiving remittances given various household covariates is calculated alternatively using probit and logit models. This gives us the propensity scores for observed covariates by ranking individuals from receiving and non-receiving households. From this, difference between labour participation of treated group (individuals from remittance-receiving households) and non-treated group (individuals from non-remittance-receiving households) is calculated. This difference is averaged out to give the Average Treatment effect on the Treated (ATT). Propensity Score Matching is considered appropriate in the cases with a small treated group and a large control group. In our dataset, only 4.3% and 8.3% households receive foreign and internal remittances respectively. The use of this technique is therefore warranted.

Different econometric methods can be used for matching the treated and control groups. In this study, we alternatively use two commonly used methods, Nearest Neighbour (NN) and Kernel propensity score matching. As a robustness check, the Nearest Neighbour estimation is also carried out using logistic regression in the first step. We also test for the balancing property to make sure that observations with same propensity score have same distribution of observable characteristics regardless of their treatement status.

3.3.5 Key findings

Our analysis proceeds as follows: First we examine the likelihood of participation in the labour market of individuals from remittance-receiving households. We also estimate this impact separately for working men and women, and households living in rural and urban areas. Besides, we study the impact on the respective labour participation of three age categories: young (15 – 25 years), middle age (26 – 50 years) and senior (51 – 65 years). In

the second step, we analyze the non-labour activities of recipient households. We study the person's likelihood of looking for a job and his/her educational attainment. The probability of both activities is studied as a whole as well as for different age groups and genders.

The third and fourth parts investigate the labour impact of remittances on the individuals participating in the labour market. In part three, we study the relationship of remittances with the number of months and days worked, while part four compares the likelihood of members of recipient households being self-employed in agricultural and non-agricultural sectors or working on wages.

A. Participation in the labour force

Results for probit estimations shown in table 3.3.3 indicate a strong, negative association of foreign remittances with the likelihood to work as compared to an insignificant one for domestic remittances. Members of foreign remittance-receiving households have a lower marginal probability³⁷ to work (0.34) than those from non-receipt households (0.63). The marginal probability for internal remittance recipients is less different from that of non-recipients (0.52 against 0.61 respectively).

According to these results, foreign remittances appear to be among three factors having a substantial impact on the probability of a person active in the labour market, the other two being the person's gender and whether or not the household is female headed. This last factor reflects the fact that households headed by females are at an average much poorer than those with male heads (the two households have an average income of Rs. 43 thousand and Rs. 100 thousand respectively). The level of household's education also seems to play a role, as members from more educated households have a higher probability to work.

³⁷ The marginal probability or marginal effects are nonlinear functions of the parameter estimates and the levels of the explanatory variables (Anderson and Newell 2003). They provide a good approximation to the amount of change in the explained variable that will be produced by a 1-unit change in a regressor.

Table 3.3.3. Remittances and Labour Participation (aggregate and age-wise) – Probit estimation

labour participation		Age 15-25		Age 26-50		Age 51-65	
Foreign	Internal	Foreign	Internal	Foreign	Internal	Foreign	Internal

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	-							
Forrem	-0.738***		-0.569**		1.044***		0.666*	
	(0.179)		(0.253)		(0.334)		(0.357)	
Age	-0.00817***	-0.00873***						
	(0.00313)	(0.00289)						
Sex	2.125***	2.017***	1.889***	1.815***	2.528***	2.415***	2.621***	2.267***
	(0.0880)	(0.0815)	(0.131)	(0.123)	(0.133)	(0.122)	(0.363)	(0.320)
dependent	0.0176	0.0244*	0.0292	0.0336	0.0384	0.0251	-0.118**	-0.0997**
	(0.0162)	(0.0146)	(0.0237)	(0.0219)	(0.0299)	(0.0265)	(0.0476)	(0.0445)
femalehead	0.820*	0.620*			1.359***	0.334		0.672
	(0.450)	(0.325)			(0.517)	(0.408)		(0.783)
Highest class								
passed	0.107***	0.128***	-0.0645	-0.0604	0.172**	0.201***	0.0174	0.0806
	(0.0397)	(0.0371)	(0.0671)	(0.0633)	(0.0676)	(0.0636)	(0.111)	(0.0983)
Insaving	-0.0413	-0.0540*	-0.0539	-0.0585	-0.0519	-0.0743	0.0669	0.0239
	(0.0332)	(0.0308)	(0.0522)	(0.0488)	(0.0510)	(0.0476)	(0.109)	(0.0969)
Region	-0.109	-0.0519	0.0617	0.124	-0.311**	-0.280**	-0.395	-0.380
	(0.0839)	(0.0785)	(0.129)	(0.121)	(0.140)	(0.133)	(0.275)	(0.252)
province	-0.0738*	-0.0659*	-0.0835	-0.0956*	-0.126**	-0.0593	0.0213	-0.0177
	(0.0378)	(0.0357)	(0.0577)	(0.0554)	(0.0628)	(0.0598)	(0.122)	(0.110)
Intrem		-0.243		-0.205		0.295		-0.344
		(0.148)		(0.237)		(0.263)		(0.370)
Constant	-0.453	-0.378	-0.306	-0.281	-0.580	-0.440	-1.933	-1.301
	(0.370)	(0.346)	(0.582)	(0.548)	(0.564)	(0.531)	(1.244)	(1.131)
Observations	1,576	1,756	565	627	801	886	166	192

Table 3.b. Marginal probabilities

Baseline equation		age 15 – 25		Age 26 – 50		Age 51-65		
	forrem	intrem	Forrem	Intrem	Forrem	intrem	forrem	intrem
0	0.6364	0.6182	0.5271	0.5029	0.773	0.753	0.597	0.600
	(0.015)***	(0.014)***	(0.255)***	(0.024)***	(0.020)***	(0.20)***	(0.049)***	(0.043)***
1	0.3484	0.5232	0.308	0.421	0.385	0.836	0.819	0.464
	(0.0642)***	(0.569)***	(0.0856)***	(0.089)***	(0.124)***	(0.063)***	(0.085)***	(0.14)***

Table 3.3.4. Remittances and Labour Participation (aggregate and age-wise) – Nearest Neighbour and Kernel PSM estimation

NN	Kernel
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Baseline equation	Treated	Controls	Difference	S.E	Treated	Controls	Difference	S.E
Forrem	0.4	0.626	-0.226	0.057	0.4	0.61	-0.21	0.05
Intrem	0.44	0.552	-0.11	0.077	0.44	0.60	-0.16	0.44
Age 15-25								
Forrem	0.406	0.75	-0.343	0.14	0.406	0.501	-0.095	0.092
Intrem	0.339	0.509	-0.16	0.11	0.33	0.50	-0.16	0.07
Age 26-50								
Forrem	0.375	0.625	-0.25	0.14	0.375	0.677	-0.302	0.88
Intrem	0.6	0.58	0.02	0.10	0.6	0.67	-0.7	0.07
Age 51-65								
Forrem	0.625	0.5	0.125	0.263	0.625	0.603	0.021	0.19
Intrem	0.434	0.739	-0.30	0.14**	0.434	0.621	-0.186	0.11

The labour participation effect of remittances is found to vary with age (Acosta 2011, Görlich et al 2007). Accordingly, we consider the impact with respect to three age categories: young (15 – 25), middle aged (26 – 50) and senior (51 – 65). The findings for these age categories concur with the baseline model. The demographically bigger categories of young and middle aged workers indicate a lower participation in the labour market among the members of foreign remittance-receiving households. The young have the lowest marginal probability to work, whereas the fall in marginal probability is the greatest among foreign remittance-receiving middle-aged individuals. Internal remittances do not seem to modify the labour participation of the recipients.

Working age women have a much higher probability of non-participation than their male counterparts (Table 3.3.5). The marginal probability to work among foreign remittance-receiving females is 1.6% as compared to 15% among the non-recipient women; the corresponding figures for men are 66% and 86%. An interesting finding is that women from more educated households have a higher probability to work than those from less educated households.

A household's geographical location also influences its labour participation. Rural foreign remittance recipients show less likelihood of working than do their urban counterparts. A rural recipient of foreign remittances has a 34% lower marginal probability to work than a non-recipient, while an urban foreign remittance receiver has an 18% less marginal probability. In rural areas, households with female heads of households and high number of dependents at home have a relatively higher probability to work, whereas wealthy households show a lower likelihood of labour participation. This labour supply behaviour probably points to the nature of work available in the rural areas. Mostly related to agriculture and livestock, work in the rural areas is often physically taxing and hazardous. The rate of labour market participation is therefore lower for wealthy households and is higher for less prosperous ones. The indicator for residence in one of the four provinces also points to lower rural labour participation, given the negative sign for other provinces as compared to the more urban Punjab taken as the default province.

The results for foreign remittances are generally significant at 1 percent level of significance.

We check our model for potential mis-specifications, and find it robust to a battery of tests. Nevertheless, as mentioned in the previous section, using probit for the study of remittances leaves the problem of potential self-selection unresolved. For this purpose, we resort to propensity score matching, controlling for demographic, economic and geographical factors that determine the receipt or not of foreign and internal remittances. Table 3.3.4 gives the results of our baseline model using the Nearest Neighbour and Kernel propensity score matching techniques. Our findings confirm the negative participation impact of foreign remittances. The average treatment effect of the treated (ATT) is -0.22 significant at 1 percent. This difference is strong and robust to the use of different PSM techniques. The effect for internal remittances of -0.11 is, as found with our baseline probit model, statistically insignificant

As a robustness check, we also run our models using logit instead of probit for ranking the remittance receiving and non-receiving households. The results of these estimations (not shown) generally concur with the probit estimations.

The above mentioned differing labour participation effects for foreign and internal remittances can be traced to the different socioeconomic conditions of the two sets of households. Foreign remittance-receiving households have an above average household income, while those receiving transfers from within the country earn much below the national

average. In our sample, foreign remittance recipients earn 82% more than the recipients of internal remittances do. The labour effect may also differ due to different monetary nature of the two remittances³⁸. Foreign remittances generally come in the form of “hard currency” like the US Dollars, Euros, Pound Sterlings etc., and do not lose their value in the times of domestic economic crisis. Consequently, migrant household might feel more comfortable about their earning and saving prospects than internal remittance-receiving households might. This differential impact is also evident in the age-wise estimations. The average treatment effects for the young and middle aged categories are significant at -0.34 and -0.25 points respectively in case of foreign remittances, while those for internal remittances are statistically insignificant. The findings for the senior category (51 – 65 years) are telling. The ATT for foreign remittances is insignificant, while that for internal remittances is a significant -0.30. Majority of the members from internal remittances-receiving households work as paid employees or as own cultivators, and are less involved in non-agricultural self-employment than foreign remittance recipients. This suggests that internal remittance receiving households quit their more physically demanding and less paid work as soon as their economic conditions allow. Alternatively, their departure from the labour market may be dictated by health concerns. Internal remittances, therefore, help the elder workers of the households to reduce their labour participation and consume more leisure. Conversely, the senior members from foreign remittance-receiving households do not significantly change their labour participation. Here, it needs to be noticed that the results of probit and PSM estimations both show a positive sign, and are weakly significant for the probit estimation. This may be associated with lower credit constraints of the household allowing the senior members to engage in self-run ventures (more on this in part D below). The lower labour participation of the middle-aged foreign remittance recipients coupled with no drop in labour participation of the old age group points to the possibility that the need or the incentive for leaving the labour market is the greatest for the middle age category. Whether for child care, taking up other household-related non-market activities, or simply for consuming more leisure, persons in the middle age group face a higher incentive structure and may have higher reservation wages.

³⁸ We thank an anonymous review of International Review of Applied Economics for suggesting this line of argument.

The above results also indicate the possibility of a threshold effect of remittances. Foreign remittances, being generally higher in value may lie above the threshold above which a left-behind household decides to reduce its participation in the labour market. Conversely, internal remittances may not be sufficient for recipient households to reduce their labour participation.

Table 3.3.5. Remittances and Labour Participation (sex and region-wise) –Probit estimation

	male participation		female participation		urban participation		rural participation	
	Foreign	Internal	Foreign	Internal	Foreign	Internal	Foreign	Internal
Forrem	-0.654***		-1.113**		-0.456*		-0.885***	
	(0.205)		(0.525)		(0.249)		(0.251)	
Age	-0.009***	-0.010***	-0.002	0.0002	-0.012***	-0.013***	-0.004	-0.004
	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)
Sex					2.181***	2.148***	2.085***	1.858***
					(0.115)	(0.109)	(0.143)	(0.129)
dependent	0.022	0.031*	0.005	0.014	-0.008	-0.001	0.051**	0.060***
	(0.019)	(0.017)	(0.030)	(0.027)	(0.023)	(0.022)	(0.023)	(0.019)
Femhead			0.844	0.336	0.487	0.112	1.341**	1.570***
			(0.553)	(0.337)	(0.615)	(0.430)	(0.615)	(0.578)
highestclasspassed	0.075	0.093**	0.163**	0.183***	0.094*	0.123**	0.127**	0.154***
	(0.048)	(0.046)	(0.071)	(0.065)	(0.052)	(0.050)	(0.061)	(0.057)
Lnsaving	-0.055	-0.059	-0.022	-0.056	0.049	0.037	-0.171***	-0.184***
	(0.042)	(0.039)	(0.052)	(0.050)	(0.043)	(0.040)	(0.055)	(0.050)
Region	-0.062	0.050	-0.224	-0.262*				
	(0.101)	(0.097)	(0.155)	(0.138)				
Province	-0.051	-0.063	-0.151**	-0.079	-0.030	-0.033	-0.126**	-0.096*
	(0.046)	(0.044)	(0.070)	(0.062)	(0.051)	(0.049)	(0.056)	(0.053)
Intrem		-0.551***		0.144		-0.086		-0.379*
		(0.163)		(0.191)		(0.194)		(0.225)
Constant	1.849***	1.783***	-0.696	-0.595	-1.367***	-1.264***	0.762	0.831

	(0.474)	(0.450)	(0.594)	(0.561)	(0.493)	(0.468)	(0.580)	(0.535)
Observations	1,024	1,114	552	642	902	1,011	674	745

Marginal probabilities								
Urban workers		Rural workers		Mal worker		Femal workers		
forrem	Intrem	forrem	Intrem	Forrem	intrem	forrem	intrem	
0	0.587 (0.20)***	0.57 (0.019)***	0.70 (0.02)***	0.67 (0.02)***	0.859 (0.01)***	0.85 (0.01)***	0.155 (0.16)***	0.15 (0.01)
1	0.406 (0.09)***	0.54 (0.07)***	0.36 (0.09)***	0.52 (0.86)***	0.66 (0.07)***	0.69 (0.055)***	0.016 (0.02)	0.194 (0.049)***

Table 3.3.6. Remittances and Labour Participation (sex and region-wise) – Nearest Neighbour and Kernel PSM estimations

NN					Kernel			
Maleworker	Treated	Controls	Difference	S.E	Treated	Controls	Difference	S.E
Forrem	0.65	0.88	-0.22	0.10	0.65	0.85	-0.20	0.7
Intrem	0.667	0.878	-0.21	0.07	0.66	0.85	-0.18	0.5
Femaleworker								
Forrem	0.032	0.35	-0.32	0.10	0.03	0.18	-0.14	0.03
Intrem	0.22	0.16	0.05	0.08	0.22	0.16	0.05	0.05
Urban								
Forrem	0.43	0.71	-0.28	0.15	0.43	0.57	-0.13	0.09
Intrem	0.43	0.76	-0.32	0.09	0.43	0.56	-0.12	0.06
Rural								
Forrem	0.73	0.72	-0.34	0.12	0.37	0.64	-0.26	0.07
Intrem	0.44	0.66	-0.22	0.11	0.43	0.56	-0.12	0.06

Similar to probit estimations, the PSM results for both male and female labour participation given in table 3.3.6 are negative and significant in the case of foreign remittance recipients. Similarly, male recipients of internal remittances show a lower labour participation than their non-recipient counterparts, while female remittance recipients show no significant treatment

effect. The substantial drop in female labour participation in case of foreign remittance receipts, particularly among less educated households, may also owe to the possibility that additional savings may allow parents to afford dowry and wedding expenses of their daughters, thus permitting the girls to exit the labour market.

Region-wise estimations show lower labour participation in rural as well as urban areas for foreign remittance recipients, whereas the participation of internal remittance-receiving households significantly drops only in rural areas. These findings probably reflect the fact that income level in the urban areas is much higher (average income being Rs. 102 thousand) than the rural areas (average income being Rs. 63 thousand). This implies that the reservation wages in the rural areas might be lower than in the cities. Work in the rural areas is often more challenging and dangerous, and receipt of remittances makes it possible for the rural workers to move out of them.

Now that we have established the negative participation effects of remittances, let us examine the activities which non-participating working age individuals pursue.

B. Activities in case of non-participation

Inactivity among remittance recipients may be due to three main reasons: leisure consumption, home production, and pursuit of education (Görlich et al 2007). The first effect, called the Disincentive effect, implies that the recipient's reservation wage rises above the prevailing market wages, and consumption of leisure becomes a better alternative. This effect can be estimated by studying the association of remittances with the likelihood of the person declaring unwilling to work. The second effect, called the home labour substitution effect, occurs when members of remittance-receiving households withdraw from the labour market to take up household responsibilities. The departure of a migrant increases the household duties of the members staying back, and receipt of transfers gives them the possibility to reduce their labour participation and tend to the household. The last effect pertaining to education is most likely among young members of remittance receiving households. Partly thanks to lower financial constraints, and partly due to relatively strong higher education incentives facing the migrant households, young members of the household could be kept out of labour market into the school for longer.

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Given data limitations, we are unable to study the home production effect. We analyse the disincentive effect through the variable “seekingwork” which takes the value of 1 if the respondent is out of work and not looking for work. We study the education effect of remittances by examining the probability of the member being enrolled at school. Four categories of enrollment are considered: primary (grade 1 to 5), middle school (grade 6 to 8), secondary and higher secondary (grade 9 to 12), and higher education (university).

Table 3.3.7. Remittances and probability of persons seeking a job – Probit estimation

VARIABLES	person seeking work		men seeking work	
	Foreign	Internal	Foreign	Internal
Forrem	-0.331		-0.846*	
	(0.315)		(0.451)	
Age	0.004	0.011**	0.018***	0.029***
	(0.005)	(0.005)	(0.005)	(0.006)
Sex	-0.926***	-1.067***		
	(0.226)	(0.213)		
Dependent	0.032	0.019	0.009	-0.020
	(0.038)	(0.035)	(0.053)	(0.044)
highestclasspassed	0.005	0.003	0.059	0.085
	(0.085)	(0.085)	(0.136)	(0.136)
Lnsaving	0.033	0.050	-0.005	-0.068
	(0.059)	(0.062)	(0.114)	(0.109)
Region	-0.547**	-0.322*	-1.041***	-0.795***
	(0.248)	(0.193)	(0.388)	(0.282)
Province	0.033	0.069	0.253*	0.277**
	(0.102)	(0.097)	(0.134)	(0.127)
Intrem		-0.481**		-1.188***
		(0.235)		(0.364)
Constant	1.772**	1.254	0.769	0.867
	(0.777)	(0.801)	(1.268)	(1.221)
Observations	617	699	156	179

Marginal probabilities					
	person seeking work		men seeking work		women seeking work
	Forrem	intrem	Forrem	intrem	forrem intrem
0	0.97 (0.008)***	0.97 (0.007)***	0.94 (0.02)***	0.94 (0.02)***	0.98 (0.005)***
1	0.94 (0.031)***	0.92 (0.028)***	0.76 (0.12)***	0.64 (0.10)***	0.98 (0.01)***

Table 3.3.8. Remittances and probability of persons seeking a job – Nearest Neighbour and Kernel

PSM estimations

	NN				Kernel			
person seeking work	Treated	Controls	Difference	S.E	Treated	Controls	Difference	S.E
forrem	0.933	0.911	0.02	0.06	0.92	0.96	-0.38	0.04
intrem	0.90	0.94	-0.04	0.04	0.90	0.96	-0.05	0.03
men seeking work								
forrem	0.8	1	-0.2	0.10*	0.8	0.92	-0.12	0.11
intrem	0.72	0.95	-0.22	0.12	0.76	0.91	-0.15	0.10
women seeking work								
forrem	1	0.9	0.1	0.07	1	0.98	0.01	0.008
intrem	0.98	0.92	0.05	0.03	0.98	0.98	-0.001	0.02

Results of probit estimation given in table 3.3.7 show an insignificant association of foreign remittances with the likelihood of being unwilling to work as opposed to internal remittances' significantly negative one. Internal remittance receiving household members have a slightly lower marginal probability of being unwilling to work than the non-receiving ones. PSM results portray a similar picture for foreign remittances (table 3.3.8). This lower likelihood to be unwilling to work is particularly the case for male household members, whereas female members show no more willingness to look for work. The sign of average treatment effect for

female willingness to work is invariably positive in the case of foreign remittances, and agrees with the strongly negative female participation effect found above.

Over all, these findings indicate that the disincentive effect may not be a reason behind foreign recipient's lower labour participation. Receipt of foreign remittances do not appear to significantly change the willingness to work of the currently out of work household members, and in the case of internal remittances, may even encourage the members, particularly the men, to look for work. The latter may be due to the less binding financial constraints of the recipient family, which may allow the potential members to look for better work. Internal remittances, in such a case, not only increase their reservation wages, but also add to their motivation to look for a correspondingly better paid job.

In terms of the remittances' effect on school enrollment, probit results given in table 3.3.9 show a mixed picture. Foreign remittances appear to increase the likelihood of recipient households going to middle school (grade 6 to 8), while their association with other levels of schooling is insignificant. The findings from propensity score matching are somewhat different, as foreign remittance recipient households do not seem to differ from non-recipient households in any enrollment category (table 3.3.10). The results for internal remittances are not robust, as we obtain different signs and levels of significance using different methods. The ATT is positive for three out of four categories, and significant for secondary school enrollment (grade 9 to 12), while it is significant and negative for primary schooling.

Table 3.3.9. Remittances and education enrollment – Probit estimation

VARIABLES	current enrollment : primary		current enrollment : middle	
	Foreign remittances	Internal remittances	Foreign remittances	Internal remittances
Forrem	-0.250		0.372**	
	(0.165)		(0.164)	
age	-0.198***	-0.195***	0.0734***	0.0704***
	(0.0112)	(0.0102)	(0.00679)	(0.00624)
sex	-0.106	-0.0944	0.0813	0.101
	(0.0806)	(0.0748)	(0.0847)	(0.0790)
hhsz	-0.000881	-0.000641	0.00606	-0.00135
	(0.0109)	(0.00975)	(0.0113)	(0.00984)
lnsavg	-0.0462	-0.0573*	-0.0752**	-0.0660**
	(0.0350)	(0.0314)	(0.0342)	(0.0313)
region	-0.185**	-0.203***	0.0116	0.0271
	(0.0783)	(0.0734)	(0.0833)	(0.0783)
province	0.121***	0.0927***	0.0189	0.0277
	(0.0356)	(0.0336)	(0.0372)	(0.0352)
intrem		-0.258**		0.0599
		(0.131)		(0.130)
Constant	2.631***	2.756***	-1.214***	-1.226***
	(0.393)	(0.357)	(0.353)	(0.325)
Observations	1,413	1,600	1,413	1,600

Robust standard errors in parentheses

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

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VARIABLES	current enrollment: secondary		current enrollment: tertiary	
	Foreign remittances	Internal remittances	Foreign remittances	Internal remittances
forrem	0.279		-0.177	
	(0.176)		(0.353)	
age	0.178***	0.177***	0.229***	0.236***
	(0.0117)	(0.0108)	(0.0246)	(0.0234)
sex	0.137	0.102	-0.0195	-0.0538
	(0.104)	(0.0957)	(0.141)	(0.131)
hhsiz	0.0210	0.0180	0.00623	-0.00352
	(0.0139)	(0.0113)	(0.0221)	(0.0189)
lnsavg	0.00631	0.0388	-0.0393	-0.0449
	(0.0449)	(0.0405)	(0.0630)	(0.0585)
region	0.0350	-0.0190	0.257*	0.239*
	(0.0993)	(0.0931)	(0.149)	(0.143)
province	-0.149***	-0.0973**	0.148***	0.131**
	(0.0468)	(0.0436)	(0.0542)	(0.0524)
intrem		0.0365		-0.225
		(0.149)		(0.195)
Constant	-3.504***	-3.842***	-4.861***	-4.770***
	(0.473)	(0.440)	(1.059)	(0.977)
Observations	1,413	1,600	1,413	1,600

Marginal probabilities

	Primary school		Middle school		Secondary school		University	
	Forrem	intrem	Forrem	Intrem	Forrem	Intrem	Forrem	Intrem
0	0.50	0.48	0.15	0.15	0.07	0.07	0.01	0.01
	(0.01)***	(0.01)***	(0.009)***	(0.009)***	(0.006)***	(0.006)***	(0.005)**	(0.005)*
1	0.40	0.38	0.25	0.17	0.11	0.08	0.008	0.007
	(0.06)***	(0.04)***	(0.05)***	(0.03)***	(0.03)***	(0.021)***	(0.009)	(0.004)

Table 3.3.10. Remittances and education enrollment – Nearest Neighbour and Kernel PSM estimations

	NN				Kernel			
	Treated	Controls	Difference	S.E	Treated	Controls	Difference	S.E
Primary school								
Forrem	0.39	0.55	-0.15	0.11	0.39	0.52	-0.13	0.05
Intrem	0.404	0.60	-0.20	0.09	0.40	0.52	-0.11	0.04
Middle school								
Forrem	0.269	0.12	0.14	0.08				
Intrem	0.19	0.13	0.06	0.06	0.19	0.16	0.03	0.034
Secondary school								
Forrem	0.21	0.14	0.07	0.08				
Intrem	0.19	0.08	0.10	0.05	0.19	0.15	0.04	0.03
University								
Forrem	0.05	0.07	-0.02	0.05	0.05	0.08	-0.03	0.02
Intrem	0.08	0.04	0.03	0.04	0.08	0.07	0.007	0.02

From this analysis, we determine that there is some evidence of increased likelihood of school enrollment among foreign remittance receiving households, though the impact is significantly visible only at the middle school level. Next, we turn to the quantity of work supplied by the remittance receiving households.

C. Quantity of labour supplied

The quantity of labour is usually studied in the literature in terms of hours worked per week. Given the nature of HIES survey used in our study, we are able to examine only the months worked during the year preceding the survey, and the number of days worked in the month prior to the survey. In this survey, 93% of workers from foreign remittance receiving households worked for 12 months, implying an uninterrupted or non-seasonal job. The proportion for non-recipient workers is 86%. Similarly 88% workers from foreign remittance receiving households report having worked 25 days or more during the last month as opposed

to 77% of non-recipient ones. The figures for internal remittance-receiving and non-receiving workers are about the same, showing little variation in the work supplied by two sets of households. We perform Ordinary Least Squares (OLS) regressions to analyse the impact of remittances on the quantity of labour supplied. Results shown in table 3.3.11 are insignificant, indicating no evidence of a statistically significant effect of remittances on the quantity of labour. Therefore we can not decide about the reduction or otherwise of the quantity of labour supplied in reaction to remittance receipts. This notwithstanding, the nature of work activity may well change due to remittances. We study this in the next part.

Table 3.3.11. Remittances and quantity of labour supplied (in months and days)

	labour months	supply: labour months	supply: labour days	labour supplied : days
	Foreign	Internal	Foreign	Internal
forrem	-0.097 (0.362)		0.551 (0.452)	
Age	0.013*** (0.003)	0.011*** (0.003)	0.037*** (0.009)	0.031*** (0.009)
Sex	1.194*** (0.302)	1.036*** (0.276)	0.354 (0.500)	0.387 (0.491)
dependent	-0.036 (0.022)	-0.030 (0.019)	0.065 (0.042)	0.047 (0.041)
femalehead	-1.072 (1.572)	-1.576 (1.291)	3.203*** (0.532)	-0.679 (2.276)
highestclasspassed	0.184*** (0.047)	0.180*** (0.046)	0.123 (0.106)	0.209** (0.106)
lnsaving	0.072* (0.042)	0.081** (0.041)	0.216** (0.087)	0.233*** (0.083)
region	0.220* (0.114)	0.241** (0.118)	0.412* (0.239)	0.280 (0.231)
province	-0.031 (0.049)	-0.010 (0.047)	-0.263** (0.117)	-0.262** (0.118)
intrem		0.165 (0.232)		-0.322 (0.621)
Constant	8.961*** (0.645)	8.975*** (0.643)	23.18*** (1.141)	23.14*** (1.080)
Observations	697	765	961	1,051
R-squared	0.136	0.128	0.050	0.043

D. Activities in case of participation

We study the participation of households in three types of activities and see whether the receipt of remittances modifies the person's probability of being self-employed in the non-agricultural sector, paid employee or own-cultivator. A positive sign for self-employment or own-cultivation would suggest better financial conditions leading to the person investing and running his/her private business. The results of probit estimations (table 3.3.12) indicate a significant and positive association between foreign remittances and the likelihood of being self-employed. There is also a strong positive association of internal remittances with own cultivation compared to a non-significant one for foreign remittances. As to the Nearest Neighbour and Kernel matching results, the average treatment effect for the three activities are insignificant even though with similar signs to the probit estimations (table 3.3.13). Only the internal remittance ATT for own cultivation is statistically significant.

Over all, the likelihood of being self-employed or tilling ones land appears to increase among remittance receiving households (these findings are however not robust). We therefore have a tentative evidence of the activity substitution effect of remittances.

Table 3.3.12. Remittances and work status – Probit estimation

	self-employed		paid employee		own cultivator	
	Foreign	Internal	Foreign	Internal	Foreign	Internal
forrem	0.540**		-0.199		-0.297	
	(0.260)		(0.245)		(0.516)	
age	0.013***	0.012***	0.0005	0.001	0.029***	0.027***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)
sex	0.314	0.345*	0.081	-0.015		
	(0.227)	(0.201)	(0.151)	(0.137)		
dependent	-0.004	-0.003	0.010	0.015	-0.001	-0.023
	(0.020)	(0.019)	(0.016)	(0.015)	(0.026)	(0.023)
highestclasspassed	-0.106**	-0.116**	0.264***	0.280***	-0.015	-0.036
	(0.051)	(0.048)	(0.042)	(0.040)	(0.068)	(0.066)
lnsaving	0.182***	0.201***	-0.218***	-0.236***	0.113*	0.113*
	(0.047)	(0.044)	(0.037)	(0.035)	(0.064)	(0.061)
region	0.376***	0.389***	0.452***	0.438***	-1.259***	-1.242***
	(0.117)	(0.112)	(0.088)	(0.084)	(0.217)	(0.199)
province	0.008	0.012	-0.031	-0.018	-0.018	-0.038
	(0.054)	(0.051)	(0.042)	(0.040)	(0.074)	(0.071)
intrem		0.349*		-0.145		0.799***
		(0.209)		(0.171)		(0.266)
female head				0.794		
				(0.658)		
Constant	-3.875***	-4.054***	1.672***	1.847***	-3.399***	-3.136***
	(0.597)	(0.559)	(0.429)	(0.412)	(0.707)	(0.683)
Observations	959	1,046	959	1,051	876	943

Marginal probabilities						
Self-employed		paid employee		own cultivator		
Forrem	intrem	forrem	intrem	forrem	intrem	
0 0.10	0.111	0.62	0.62	0.02	0.02	
(0.010)***	(0.01)***	(0.01)***	(0.015)***	(0.007)***	(0.006)***	
1 0.23	0.192	0.54	0.57	0.01	0.13	
(0.07)***	(0.05)***	(0.09)***	(0.06)***	(0.017)	(0.02)***	

Table 3.3.13. Remittances and work status – Nearest Neighbour and Kernel PSM estimations

	NN				Kernel			
self-employed	Treated	Controls	Difference	S.E	Treated	Controls	Difference	S.E
Forrem	0.26	0.16	0.1	0.10	0.26	0.12	0.14	0.08
intrem	0.18	0.13	0.05	0.07	0.18	0.12	0.06	0.05
paid employee								
forrem	0.53	0.63	-0.1	0.13	0.53	0.61	-.08	0.09
intrem	0.57	0.64	-0.067	0.99	0.57	0.63	-0.05	0.06
own-cultivator								
forrem	0.033	0.16	-0.11	0.09	0.033	0.05	-0.02	0.03
intrem	0.11	0.01	0.10	0.04	0.11	0.05	0.066	0.04

Concluding Remarks

This paper studied the labour participation and supply effects of foreign and within-country remittances using probit and propensity score matching techniques. We find a sizeable drop in the labour participation of foreign remittance receiving households. This corroborates the widespread negative participation impact found in the literature. However, the more numerous internal remittances do not appear to have a significant impact on the participation rate of the individuals from recipient households. Households receiving transfers from within the country are at an average much poorer than the relatively better off foreign remittance receiving households. We hypothesize that the addition of non-labour income resulting from internal remittances does not raise the reservation wages of the recipient household members to warrant a reduction in labour participation.

The drop in labour participation in foreign remittance households is particularly acute in Pakistan's rural areas and among women. The withdrawal of women may not be a pernicious effect in a developing country context, as non-participating women consequently spend more time in home production and child care. This leads to such improvements as lower infant mortality (Duryea et al. 2005).

We find that young and middle age groups are more likely to reduce their labour market participation than the old age group. Among the recipients of internal remittances, only the old age group of workers shows a significant drop in labour participation. This may owe to the low paid, more physical nature of work available to the comparatively poorer internal remittance receiving households, which might affect the old workers' health and cause the their early exit from the labour market.

Among other questions examined, there is some evidence of higher probability of school enrollment among remittance recipients, but none for lesser willingness to look for work among those out of work. Working individuals do not appear to change their amount of work significantly, but they are more likely to be self-employed (if receiving foreign remittances) and own-cultivating (if receiving internal remittances).

To sum up, our study shows a drop in labour participation due to remittances, particularly foreign remittances. However, this study does not allow a categorical conclusion regarding the nature of remittances. The over all impact of remittances on the labour market may not be negative, as other indirect factors may also be at play. Increase in consumption and investment as a result of remittances may boost domestic production leading to higher employment among non remittance-receiving households. Besides, the presence of education effect and self-employment-related investment should also temper the remittances' damaging effects on the labour market.

Our analysis mostly dealt with the participation of labour force in the context of foreign and internal remittances. Another question worth probing is how the members of remittance receiving households vary the number of hours they work. The study of their wage rates, and subsequently their productivity, can shed more light on the labour supply effects of remittances. Due to data limitations, this study could not examine the labour market

participation and supply effects of remittances with respect to the amounts transferred. Analysis of this question in the future could throw light on the moral hazard problems and the potential for a dependency mindset among the recipient households proposed in the literature.

In this chapter, we examined two ways in which remittances influence Pakistan's competitiveness. Remittances have myriad other effects on a developing country's economic development. In the following chapter, we take up two of the more important ones: those on the country's poverty and economic disparity.

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APPENDIX

APPENDIX A.

Table A3.1. Remittances and REER - Linear

Determinants			Dependent Variables		
	Mean	SD			
Intercept	0.681	4.800			
Open	-0.374	0.309			
TOT	-0.192	0.230			
GOV)	-0.297	0.171			
Gdppcw	-0.614	0.269			
Pop	2.857	1.076			
ODA	-0.047	0.066			
FDI	0.029	0.060			
Rem	0.270	0.056			
Exchange.rate	-0.049	0.179			
Disaster	0.021	0.061			
Quantiles					
	2.5%	25%	50%	75%	97.5%
Intercept	-8.611	-2.487	0.640	3.783	10.167
Open	-0.991	-0.569	-0.375	-0.173	0.247
TOT	-0.655	-0.339	-0.189	-0.042	0.268
GOV)	-0.637	-0.409	-0.296	-0.186	0.036
Gdppcw	-1.148	-0.791	-0.614	-0.436	-0.070
Pop	0.747	2.141	2.852	3.557	4.991
ODA	-0.179	-0.090	-0.047	-0.005	0.084
FDI	-0.091	-0.009	0.029	0.068	0.148
Rem	0.157	0.233	0.270	0.307	0.384
exchange.rate	-0.400	-0.166	-0.048	0.066	0.307
Disaster	-0.098	-0.018	0.020	0.060	0.142

Table A3.2 Remittances and REER - IV estimation with GDP per capita
as Balassa-Samuelson indicator

	Mean	SD			
Intercept	3.996	8.89			
Rem	0.27	0.27			
Open	-0.309	0.80			
TOT	-0.403	0.53			
GOV	-0.216	0.49			
GDPpcp	-0.913	1.02			
Pop	2.196	1.84			
ODA	-0.133	0.17			
FDI	0.059	0.16			
exchange rate	-0.018	0.41			
Disaster	0.079	0.15			
Quantiles					
	2.5%	5%	50%	95%	97.5%
Intercept	-14.10	-10.60	4.074	18.00	21.37
Rem	-0.25	-0.17	0.26	0.71	0.82
Open	-1.87	-1.59	-0.299	1.00	1.24
TOT	-1.39	-1.23	-0.404	0.45	0.65
GOV	-1.18	-1.01	-0.218	0.59	0.71
GDPpcp	-2.85	-2.55	-0.935	0.78	1.12
Pop	-1.26	-0.73	2.113	5.27	5.76
ODA	-0.47	-0.40	-0.135	0.15	0.21
FDI	-0.25	-0.20	0.063	0.32	0.38
exchange rate	-0.86	-0.68	-0.015	0.66	0.81
Disaster	-0.22	-0.17	0.077	0.33	0.36

APPENDIX B.**B1. ROBUSTNESS CHECKS***B1.1. Baseline Probit model for w15*

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	866	154	1020
-	86	470	556
-----+-----+-----			
Total	952	624	1576

Classified + if predicted $\Pr(D) \geq .5$ True D defined as $w15 \neq 0$

Sensitivity	$\Pr(+ D)$	90.97%
Specificity	$\Pr(- \sim D)$	75.32%
Positive predictive value	$\Pr(D +)$	84.90%
Negative predictive value	$\Pr(\sim D -)$	84.53%

False + rate for true $\sim D$	$\Pr(+ \sim D)$	24.68%
False - rate for true D	$\Pr(- D)$	9.03%
False + rate for classified +	$\Pr(\sim D +)$	15.10%
False - rate for classified -	$\Pr(D -)$	15.47%

Correctly classified	84.77%
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Probit model for w15, goodness-of-fit test

```

number of observations =    1576
number of covariate patterns =    1562
Pearson chi2(1552) =    1586.10
Prob > chi2 =    0.267

```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	1576	-1058.017	-653.779	10	1327.558	1381.185

Note: N=Obs used in calculating BIC; see [R] BIC note

Variable	VIF	1/VIF
Lnsaving	17.43	0.057
Age	7.10	0.140
highestclass	6.90	0.144
dependent	4.73	0.211
province	4.53	0.220
sex	3.10	0.322
region	2.52	0.396
forrem	1.10	0.910
femalehead	1.07	0.937
Mean VIF	5.39	

B1.2. Propensity score test : baseline equation with probit

Foreign remittances

		Mean		%reduct		t-test			
Variable	Sample	Treated	Control	%bias	bias	t	p> t		
-----+-----+-----									
dependent	Unmatched	5.438	5.457	-0.7		-0.12	0.906		
	Matched	4.64	4.2133	15.8	-2217.0	1.14	0.255		
Insaving	Unmatched	11.167	10.494	61.2		9.36	0.000		
	Matched	11.282	11.045	21.5	64.8	1.68	0.094		
femalehead	Unmatched	.04274	.0027	27.1		11.14	0.000		
	Matched	.06667	0	45.1	-66.5	2.30	0.023		
highestcla~d	Unmatched	2.293	2.345	-4.9		-0.45	0.653		
	Matched	2.426	2.64	-20.1	-311.6	-1.27	0.208		
region	Unmatched	.359	.459	-20.5		-3.54	0.000		
	Matched	.426	.4	5.4	73.4	0.33	0.742		
province	Unmatched	2.024	2.171	-13.1		-2.28	0.023		
	Matched	1.733	1.426	27.4	-109.1	2.11	0.036		

Summary of the distribution of the abs(bias)

BEFORE MATCHING

Percentiles		Smallest	
1%	.680	.680	
5%	.680	4.877	
10%	.680	13.089	Obs 6
25%	4.877	20.482	Sum of Wgt. 6
50%	16.786	Mean	21.234
	Largest	Std. Dev.	21.854
	75%	27.080	13.089
90%	61.197	20.482	Variance 477.631
95%	61.197	27.080	Skewness 1.058
99%	61.197	61.197	Kurtosis 2.952

AFTER MATCHING

Percentiles		Smallest	
1%	5.447	5.447	
5%	5.447	15.771	
10%	5.447	20.075	Obs 6
25%	15.771	21.541	Sum of Wgt. 6
50%	20.808	Mean	22.549
	Largest	Std. Dev.	13.243
	75%	27.371	20.075
90%	45.092	21.541	Variance 175.396

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95%	45.092	27.371	Skewness	.588
99%	45.092	45.092	Kurtosis	2.702

Sample	Pseudo R2	LR chi2	p>chi2
Unmatched	0.062	38.77	0.000
Matched	0.059	11.92	0.036

Internal remittances

Variable	Sample	Mean	%reduct	%bias	t	p> t
dependent	Unmatched	5.176	5.437	-7.4	-2.32	0.021
	Matched	4.4156	-4.5	39.8	-0.44	0.657
Insaving	Unmatched	10.612	10.53	7.1	1.52	0.129
	Matched	10.815	10.977	-14.1	-97.7	0.196
femalehead	Unmatched	.049	.004	28.1	13.28	0.000
	Matched	.0820	.0149	41.7	-48.6	0.010
highestcla~d	Unmatched	2.329	2.345	-1.5	-0.19	0.853
	Matched	2.425	2.440	-1.4	-0.11	0.910
region	Unmatched	.353	.460	-21.9	-5.38	0.000
	Matched	.529	.447	16.8	23.2	0.180
province	Unmatched	1.950	2.152	-19.1	-4.52	0.000
	Matched	1.858	1.843	1.4	0.12	0.902

Summary of the distribution of the abs(bias)

BEFORE MATCHING

Percentiles			Smallest		
1%	1.492		1.492		
5%	1.492		7.123		
10%	1.492	7.413	Obs	6	
25%	7.123	19.086	Sum of Wgt.	6	
50%	13.249		Mean	14.177	
	Largest	Std. Dev.	10.322		
	75%	21.885	7.413		
90%	28.064	19.086	Variance	106.556	
95%	28.064	21.885	Skewness	.110	
99%	28.064	28.064	Kurtosis	1.516	

AFTER MATCHING

Percentiles		Smallest		
1%	1.397	1.397		
5%	1.397	1.411		
10%	1.397	4.462	Obs	6
25%	1.411	14.086	Sum of Wgt.	6
50%	9.274	Mean	13.312	
	Largest	Std. Dev.	15.370	
	75%	16.804	4.462	
90%	41.711	14.086	Variance	236.246
95%	41.711	16.804	Skewness	1.138
99%	41.711	41.711	Kurtosis	2.997

Sample	Pseudo R2	LR chi2	p>chi2
<hr/>			
Unmatched	0.047	45.43	0.000
Matched	0.027	10.21	0.11

B2. PSM ESTIMATIONS USING LOGIT**Table B2.1 Remittances and Labour Participation (aggregate and age-wise) – PSM Nearest Neighbour estimation**

1. Aggregate

Foreign remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
-----+-----						
w15 Unmatched		.4	.614	-.214	.057	-3.72
ATT		.4	.626	-.226	.098	-2.29
-----+-----						

psmatch2: | Common

Treatment | support

assignment | On support | Total

-----+-----+-----		
Untreated		1,502
Treated		75
-----+-----+-----		
Total		1,577

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Internal remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
w15 Unmatched		.440	.606	-.165	.043	-3.77
ATT		.440	.738	-.298	.072	-4.14

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
Untreated	1,623	1,623
Treated	134	134
Total	1,757	1,757

2. Age-wise

Foreign remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
work1525	Unmatched	.406	.527	-.120	.090	-1.33
ATT		.406	.5	-.093	.162	-0.58

psmatch2: | Common

Treatment | support

assignment | On support | Total

Untreated	533	533
Treated	32	32
Total	565	565

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
work2650	Unmatched	.375	.689	-.314	.083	-3.75
ATT		.375	.5	-.125	.144	-0.87

psmatch2: | Common

Treatment | support

assignment | On support | Total

Untreated	769	769
Treated	32	32
Total	801	801

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
----------	--------	---------	----------	------------	------	--------

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-----+-----						
work5165	Unmatched		.625	.618	.006	.176
ATT			.625	.5	.125	.263
-----+-----						

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
-----+-----+-----		
Untreated	160	160
Treated	8	8
-----+-----+-----		
Total	168	168

Chapter 3: Remittances to Pakistan and Competitiveness

Internal remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
work1525	Unmatched	.339	.520	-.181	.071	-2.53
ATT		.339	.584	-.245	.111	-2.19

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
Untreated	574	574
Treated	53	53
Total	627	627

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
work2650	Unmatched	.6	.678	-.078	.068	-1.15
ATT		.6	.8	-.2	.092	-2.16

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
Untreated	836	836
Treated	50	50
Total	886	886

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
work5165	Unmatched	.434	.621	-.186	.108	-1.72

ATT	.434	.608	-.173	.158	-1.10
-----	------	------	-------	------	-------

-----+-----+-----		
psmatch2: Common		
Treatment support		
assignment	On suppor	Total
-----+-----+-----		
Untreated	169	169
Treated	23	23
-----+-----+-----		
Total	192	192

Table B2.2 Remittances and Labour Participation (sex and region-wise) –PSM Nearest Neighbour estimation

1. Sex-wise

Foreign remittances

-----+-----+-----						
Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
-----+-----+-----						
malework	Unmatched	.659	.856	-.197	.055	-3.58
ATT	.659	.75	-.090	.111	-0.82	

-----+-----+-----		
psmatch2: Common		
Treatment support		
assignment	On suppor	Total
-----+-----+-----		
Untreated	980	980
Treated	44	44
-----+-----+-----		
Tota	1,024	1,024

Chapter 3: Remittances to Pakistan and Competitiveness

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
-----+-----						
femwork	Unmatched	.032	.159	-.127	.066	-1.92
ATT		.032	.193	-.161	.089	-1.81
-----+-----						

psmatch2: Common			
Treatment support			
assignment	On suppor		Total
-----+-----+-----			
Untreated	521		521
Treated	31		31
-----+-----+-----			
Total	552		552

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Internal remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
malework	Unmatched	.666	.850	-.183	.046	-3.96
ATT		.666	.863	-.196	.081	-2.41

```

psmatch2: | Common
Treatment | support
assignment | On suppor | Total
-----+-----+-----
Untreated | 1,048 | 1,048
Treated   | 66   | 66
-----+-----+-----
Total     | 1,11 | 1,11

```

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
femwork	Unmatched	.220	.160	.060	.047	1.26
ATT		.220	.191	.029	.080	0.37

```

psmatch2: | Common
Treatment | support
assignment | On suppor | Total
-----+-----+-----
Untreated | 574   | 574
Treated   | 68    | 68
-----+-----+-----
Total     | 642   | 642

```

2. Region-wise

Foreign remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
wurban	Unmatched	.437	.574	-.137	.089	-1.54
ATT		.437	.656	-.218	.167	-1.31

psmatch2 : Common		
Treatment support		
assignment	On suppor	Total
Untreated	870	870
Treated	32	32
Total	902	902

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
wrural	Unmatched	.372	.669	-.297	.074	-4.00
ATT		.372	.651	-.279	.127	-2.19

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
Untreated	632	632
Treated	43	43
Total	675	675

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Internal remittances

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
wurban	Unmatched	.436	.573	-.136	.060	-2.24
ATT	.436	.676	-.239	.102	-2.33	

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
Untreated	940	940
Treated	71	71
Total	1,011	1,011

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
wrural	Unmatched	.444	.651	-.207	.063	-3.28
ATT	.444	.698	-.253	.107	-2.37	

psmatch2: Common		
Treatment support		
assignment	On suppor	Total
Untreated	683	683
Treated	63	63
Total	746	746

CHAPTER 4: REMITTANCES, INEQUALITY AND POVERTY IN PAKISTAN: MACRO AND MICROECONOMIC EVIDENCE

« *Inequality and the misery of the poor are part of the divine scheme.* » Thomas Malthous (1798)

4.1 INTRODUCTION³⁹

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

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

On the other hand, in their pioneering study on migration from rural areas of Pakistan, Gilani et al. (1981) found an inequality increasing effect of international remittances. Similarly, Adams (1998) determined that even though poverty in rural Pakistan may have been reduced as a result of international migration, the inability of the poorest households to

³⁹ Earlier versions of this study were presented at the 11th Nordic Conference in Development Economics, HECER/WIDER, Helsinki, Finland (June 2010), and 59ème Congrès de l'Association Française de Science Économique, l'Université Paris Ouest-Nanterre La Défense (September 2010), as "Does every dollar count? macro and micro evidence of remittances' impact on poverty and inequality in Pakistan". We thank the conference participants for their useful comments and suggestions.

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

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

Hypotheses tested and research questions

We seek to test the following hypotheses.

H1. Remittances to Pakistan alleviate poverty.

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

resulting human capital accumulation should ultimately also lead to better skills and lower poverty.

H2. Remittances from North America increase inequality in Pakistan.

Pakistani Diaspora in Canada and the United States mostly comes from upper-middle and high income background. Besides being highly educated⁴⁰, emigrants to North America have been the highest earners among all groups of Pakistani migrants, their average income being even higher than the average U.S household income⁴¹. Therefore, such brain drain remittances inflows from North America should exacerbate disparities, both in absolute and relative terms.

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

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

H4. Remittances have an ambiguous impact on inequality.

The net impact of remittances on inequality cannot be judged a priori, and depends on the cumulative effect of remittances from the three migrant-sending regions. Given that altruism is probably the dominant motive behind remittances to Pakistan on the household level (Chapter 2, Anwar and Mughal 2012), remittances should improve the income and

⁴⁰ The 2005 American Community Survey undertaken by the US Census Bureau shows that among the male Pakistani population aged 25 years and over, 60.9% had bachelor's degrees or higher while the American average for the same category was 28.5% (Oda, 2009). In contrast, tertiary enrolment rate in Pakistan is hardly 5 percent.

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

consumption levels of the low and middle-income recipient households, thereby reducing overall level of inequality. However, the skill composition of the Pakistani immigrant community is evolving, as more and more skilled and highly qualified Pakistanis immigrate (Kock and Sun 2011). These migrants are usually from the middle or upper income groups, and the money they send should therefore increase the disparities further. Consequently, the aggregate impact of remittances on inequality depends on which of these inequality reducing and enhancing effects dominates.

In the coming sections, we seek evidence for these hypotheses. We begin by briefly introducing the concepts of poverty and inequality, and describing the state and evolution of poverty and inequality in Pakistan. In section 4.3, we present our microeconomic study, followed by a time series analysis in section 4.4. The microeconomic analysis allows us to understand remittances' effects on various indicators of household poverty and inequality, while the macroeconomic part sheds light on the impacts of foreign remittances coming from different remitting regions. Section 4.5 concludes and discusses policy implications of our main findings.

4.2 POVERTY AND INEQUALITY

4.2.1 What is inequality?

Economic inequality can be defined as “the fundamental disparity that permits one individual certain material choices, while denying another individual those very same choices”(Ray, 1998 p. 170). Inequality has been one of the most keenly debated and studied phenomenon in the human history. In the economic manifestation, inequality was considered an important social reality. Early thinkers and political economists such as Thomas Malthous, John Stuart Mill and Alfred Marshall held inequality to be necessary for productivity, capital accumulation and population control. For instance, Malthous asserted that :

« Receiving more income would ake every man fancy himself comparatively rich and able to indulge himself in many hours or days of leisure. This would give a strong and immediate check to productive industry, and in a short time, not only the nation would be poorer, but the lower classes themselves would be much more distressed » (Malthous, 1970, p. 94-95).

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In the recent decades, however, the negative influence of economic inequalities has increasingly been underscored. John Rawls, for example, embraced the view that Economic inequalities, if left unbridled, lead to political inequalities and status inequalities, which can ultimately threaten the liberties of the least well-off both directly and indirectly (Rawls, 2001, pages 131-132).

Moreover, as writes Kevin Phillips

“Either democracy must be renewed, with politics brought back to life, or wealth is likely to cement a new and less democratic regime-plutocracy by some other name.” (Phillips, 2003, p. 422).

This narrative from income inequality, to the evisceration of true democracy, to the tyranny of the rich—is the contemporary liberal’s version of *The Road to Serfdom* (Wilkinson, 2009).

Such harmful effects of inequality have also found more support in the economics literature thanks to better data availability and more computing power at the researchers’ disposal. Economic inequality is nowadays empirically studied in its numerous dimensions : wages, labour earnings, market income, pre and post-tax income, consumption, and wealth. Consumption and wealth are useful in assessing lifetime economic inequalities, being non-transitory and less subject to short-run shocks, whereas the other variables react to the near-term economic conjuncture, and thus reflect the course of recent economic progress. In the developing countries, mostly the income and consumption aspects of inequality are examined due to better data availability.

Inequalities can be evaluated on individual, household, town, regional, country, international or global scale. Country inequality (or within-country inequality) considers the variance of income among the citizens of a particular country, International or between-country inequality (both unweighted and population weighted) considers the variance in average incomes among the world’s nations, while global inequality takes the total World population to give the dispersion at the individual level(Woolcock, 2009). About 70 percent of the economic inequality in the World today pertains to between-country disparities, within-country inequalities playing only a minor role (Milanovic, 2006).

Economic inequalities can be good as well as bad. According to Ravallion (2007) :

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« good inequalities are those that reflect and reinforce the market-based incentives that are needed to foster innovation, entrepreneurship, and growth. Bad inequalities, however, not only generate higher poverty now, but also impede future growth and poverty reduction. Social exclusion, discrimination, restrictions on migration, constraints on human development, lack of access to finance and insurance, corruption, and uneven influence over public actions are all sources of inequality that limit the prospects for economic advancement among certain segments of the population, thereby perpetuating poverty in the future. »

Inequality can be absolute as well as relative. Absolute inequality” depends on the absolute differences in levels of living. Relative inequality, on the other hand, depends on the ratios of individual incomes to the overall mean (Ravallion, 2004). If in a given economy, the incomes of all the individuals double, the relative inequality will stay untouched, while the absolute inequality will double.

Economic disparities owe their existence to myriad economic and social factors including education, wealth, labor market, innate ability, personal preference for work, leisure and risk, race, gender, and cultural practices.

4.2.2 Measures of inequality

Economic inequality can be measured using different indicators: Gini coefficient, Theil index, Hoover index, variance of logs, the first/fifth quantile and the first/tenth decile ratio, and the First/ninety-ninth percentile ratio. A good inequality measure must satisfy certain statistical properties (see Litchfield, 1999; Cowell, 1999 and 2006), which include:

(1) Pigou-Dalton transfer sensitivity, (2) symmetry, (3) mean independence, (4) population homogeneity, and (5) decomposability. The Pigou-Dalton transfer principle implies that the value of the inequality measure decreases as a result of a progressive transfer. Symmetry requires the measure to be independent of personal identity of income unit. The mean independence or scale invariance principle requires that the measure should be independent of proportional changes in the income levels of all income units. In order to satisfy the population homogeneity principle, the measure should be invariant to replications of the

population, and for the decomposition principle, the measure needs to be decomposable into intuitive population subgroups

Gini index, Theil index, Hoover index and variance of log all satisfy these five basic properties. Among these measures, Gini coefficient is the most widely used scalar measure, being simple, intuitive and easy to calculate. It is the difference between the 45 degree line and the Lorenz curve that shows the cumulative distribution of income. It ranges from a minimum of zero (absolute equality) to a maximum of 1 (where one individual possesses all the resources). The major drawback of Gini coefficient is that it does not convey any information about the shape of the Lorenz curve. It is highly sensitive to the middle part of income distribution, and thus may not capture movements at the extremes of the income or consumption distribution. For the latter, the richest to poorest quantile, decile or percentile ratios are pertinent, as they only consider the relevant population groups. A high or increasing quantile ratio, for instance, indicates a worsening inequality situation due to the falling behind of the poor bottom quantile with respect to the richest one. Another commonly used statistic is the Teil index, or the Mean Logarithmic Deviation (MLD).

For a detailed account of inequality measurement, see Jenkins and Micklewright (2007) and Cowell (2000, 2006).

Now, let us have an overview of the course of inequality in Pakistan.

4.2.3 Inequality in Pakistan

In Pakistan, the question of economic disparities first gained significance in the 1960s, when the government's industrialization drive led to the emergence of widening economic disparity between the masses and a small number of industrialist families which presumably held much of the country's private assets. The first analysis in this context was Bergan (1967), who found that the lowest 5 percent of households received only 1 percent of the income, as compared to the richest 5 percent households which received 20 percent of the national income. From the 1970s, the question of economic inequality in Pakistan has been frequently studied, see, for instance Khandker (1973), Mujahid (1978), Mahmood (1984), Kruijk and Leeuwen (1985), Ahmed and Ludlow (1989), Jafari and Khattak (1995), Haq (1998), Ahmed

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(2000) , Jamal (2003) and Anwar (2005a). For a review of previous studies on inequality, see Kemal (2003), Anwar (2005a) and zakir and Idrees (2009).

The coverage and scope of existing work on income distribution in Pakistan is limited to estimating inequality using mostly two or three periods' household survey data (table 4.1). These studies employ different methods, choose different measurement of living standard indicators (household income or consumption) and use published grouped or primary household survey data, took household rather than individual as the reference unit, and thereby reported contradictory results about trends in income distribution (zakir and Idrees, 2009).

Table 4.1. Earlier Studies on inequality in Pakistan

Table 2

Inequality Trends in Pakistan as Shown by the Earlier Studies

Author	Welfare Indicator	Area Coverage	Inequality Trends in the Sixties and Seventies					
			63-64 to 66-67	66-67 to 68-69	68-69 to 69-70	69-70 to 70-71	70-71 to 71-72	71-72 to 1979
Khandher (1973)	Household Income	Pakistan	Decrease	Decrease	—	—	—	—
		Rural	Decrease	Decrease	—	—	—	—
		Urban	Increase	Decrease	—	—	—	—
Naseem (1973)	Per Capita Income	Pakistan	Decrease	Decrease	—	—	—	—
		Rural	Decrease	Decrease	—	—	—	—
		Urban	Increase	Decrease	—	—	—	—
Naseem (1973)	Household Consumption	Rural	Stagnant	Decrease	Decrease	Stagnant	—	—
		Urban	Increase	Decrease	Decrease	Decrease	—	—
		Urban	Increase	Decrease	Decrease	Decrease	—	—
Abuiddin (1975)	Household Income	Rural	Decrease	Decrease	Decrease	Stagnant	Increase	—
		Urban	Increase	Decrease	Decrease	Decrease	Increase	—
		Urban	Increase	Decrease	Decrease	Decrease	Increase	—
Abuiddin (1975)	Household Consumption	Rural	Decrease	Decrease	Stagnant	Decrease	Increase	—
		Urban	Increase	Decrease	Decrease	Decrease	Increase	—
		Urban	Increase	Decrease	Decrease	Decrease	Increase	—
Abuiddin (1975)	Per Capita Income	Rural	Decrease	Decrease	Increase	Decrease	Increase	—
		Urban	Increase	Decrease	Decrease	Decrease	Increase	—
		Urban	Increase	Decrease	Decrease	Decrease	Increase	—
Abuiddin (1975)	Per Capita Consumption	Rural	Decrease	Decrease	Decrease	Increase	Increase	—
		Urban	Increase	Increase	Decrease	Decrease	Increase	—
		Urban	Increase	Increase	Decrease	Decrease	Increase	—
Mahmood (1984)	Household Income Gini	Pakistan	Decrease	Decrease	Decrease	Decrease	Increase	Increase
		Rural	Decrease	Decrease	Increase	Decrease	Increase	Increase
		Urban	Decrease	Decrease	Decrease	Increase	Increase	Increase
Mahmood (1984)	Household Income Coefficient of Var.	Pakistan	Increase	Decrease	Decrease	Decrease	Increase	Increase
		Rural	Decrease	Decrease	Increase	Decrease	Increase	Increase
		Urban	Increase	Decrease	Decrease	Decrease	Increase	Increase
Mahmood (1984)	Household Income Atkinson Index	Pakistan	Decrease	Decrease	Decrease	Decrease	Increase	Increase
		Rural	Decrease	Decrease	Increase	Decrease	Increase	Increase
		Urban	Increase	Decrease	Decrease	Increase	Increase	Increase
Choudhary (1984)	Household Income	Pakistan	Decrease	Decrease	Increase	Decrease	Increase	Increase
		Rural	Decrease	Decrease	Decrease	Decrease	Increase	Increase
		Urban	Increase	Decrease	Decrease	Decrease	Increase	Increase
Choudhary (1984)	Per Capita Income	Pakistan	Decrease	Decrease	Decrease	Decrease	Increase	Increase
		Rural	Decrease	Decrease	Increase	Decrease	Increase	Increase
		Urban	Increase	Increase	Decrease	Decrease	Increase	Increase
Kruijk and Leeuwen (1985)	Household Income	Pakistan	—	—	—	—	—	Increase
		Rural	—	—	—	—	—	Increase
		Urban	—	—	—	—	—	Increase

Continued—

Table 2—(Continued)

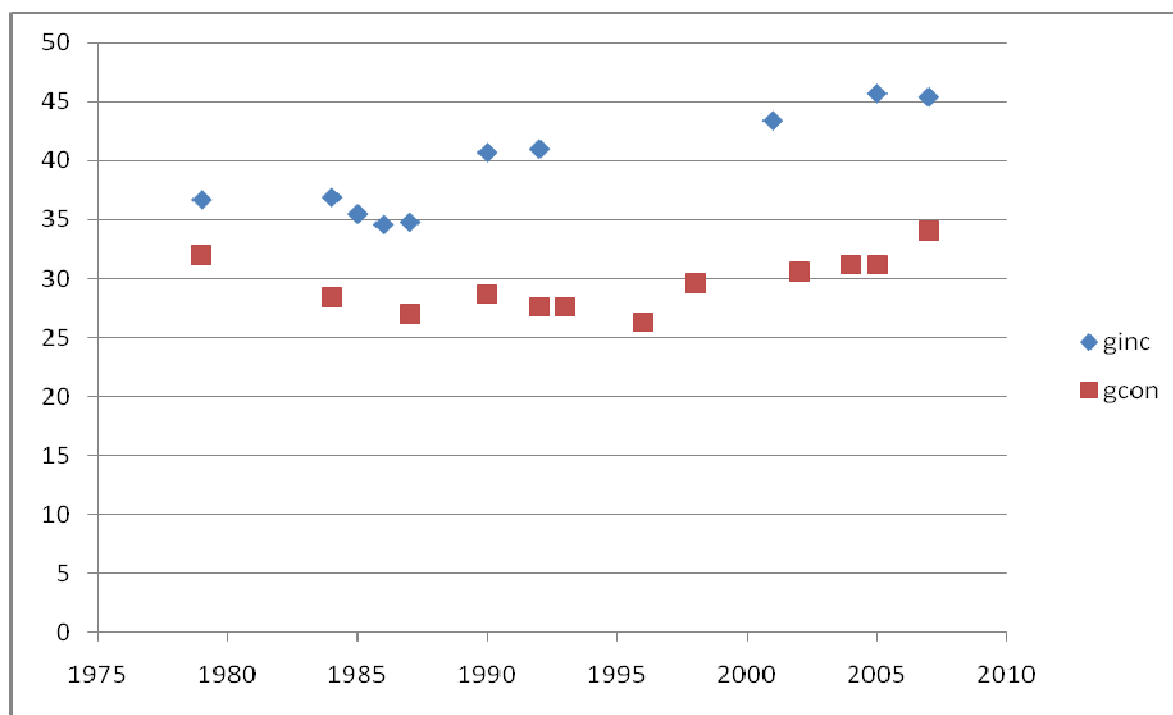
Author	Welfare Indicator	Area	Inequality Trends in the Eighties				
			1979 to 84-85	84-85 to 85-86	85-86 to 86-87	86-87 to 87-88	87-88 to 90-91
Ahmad and Ludlow (1989)	Household Income	Pakistan	Increase	—	—	—	—
		Pakistan	Increase	—	—	—	—
	Household Consumption	Rural	Increase	—	—	—	—
		Urban	Decrease	—	—	—	—
Jafri and Khattak (1995)	Household Income	Pakistan	Decrease	Decrease	Decrease	Increase	Increase
		Rural	Increase	Decrease	Decrease	Decrease	Increase
		Urban	Decrease	Decrease	Stagnant	Increase	Increase
	Consumption per Adult Equivalent	Pakistan	Increase	Decrease	—	Increase	Decrease
Haq (1998)	Adult Equivalent	Rural	Increase	Decrease	—	Decrease	Decrease
		Urban	Increase	Decrease	—	Stagnant	Decrease
Author	Welfare Indicator	Area	Inequality Trends in Late Eighties and Nineties				
			1987-88 to 1998-99		1998-99 to 2001-02		
Jamal (2003)	Consumption per Adult Equivalent	Pakistan	Increase		—		—
		Rural	Increase		—		—
		Urban	Increase		—		—
Anwar (2003)	Consumption per Adult Equivalent	Pakistan	—		Increase		Increase
		Rural	—		Increase		Increase
		Urban	—		Decrease		Decrease

Source : Zakir and Idrees (2009).

The over all trend that emerges is that in the 1960s, income disparities slightly went down, rose marginally in the 70s, and fell again in the mid 80s. By late 1980s, the inequalities were again on the move, and the income Gini crossed 0.40 in the 1990s. The trend has been continuing, and by the mid 2000s, Pakistani economy had reached its highest level of inequities, with income Gini above 0.45.

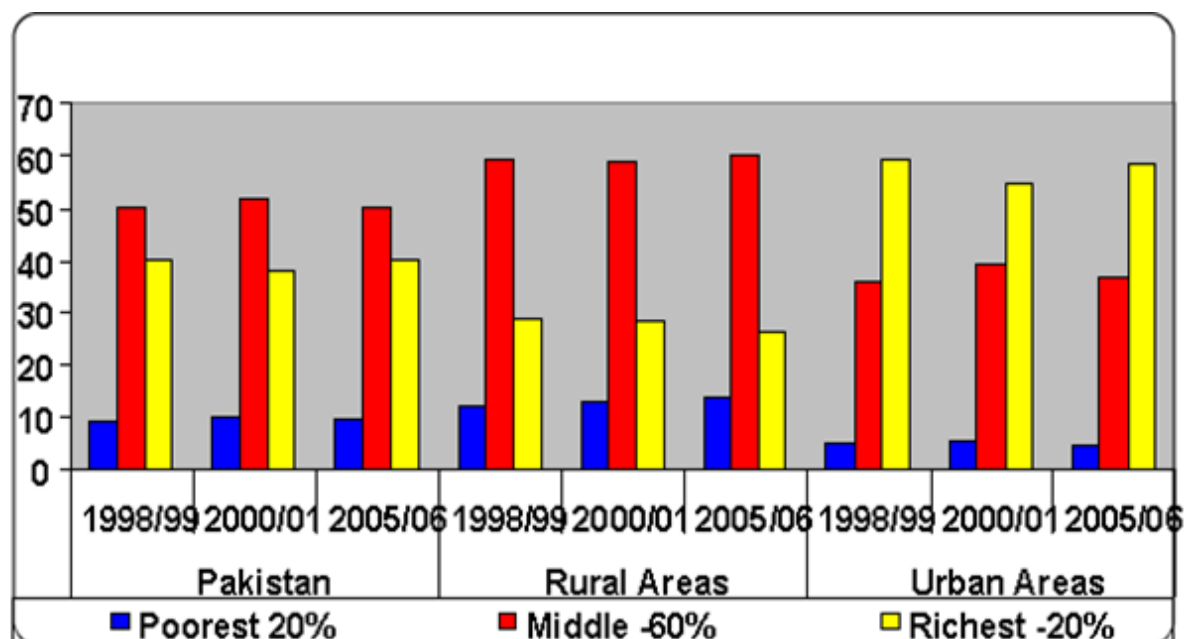
Consumption inequality, however, has treaded a different trajectory, staying roughly flat in the 1970s and 80s, slightly fell in the mid 90s and went back up in the 2000s. The consumption Gini coefficient, at around 0.30, was practically the same in late 60s (when the first measurements were taken) as well as in the early 2000s. Consumption inequality has shown little variation (Gini index ranging from high 20s to mid 30s percent) as compared to income inequality (Gini index which has fluctuated in the mid 30s to mid 40s percent range). The trend for both, however, has been upward in the 2000s.

Figure 4.1. Gini index for income and consumption



Despite this deteriorating image, Pakistan is still a relatively less inegalitarian society (figure 4.1). In comparison, several Latin American and Sub-Saharan African countries have Gini indices in excess of 0.5. Nonetheless, of late, there are signs that inequality is on the rise. The Government is finding this worrying situation a critical issue considering its implications for employment and poverty (Government of Pakistan, 2008). According to the 2007/08 Pakistan Economic Survey, the mean expenditures of the richest 20 percent were more than four times of the poorest 20% for the period 2000/01 -2005/06 (figure 4.2).

Figure 4.2. Consumption Shares of the Poorest (20%), Middle (60%) and Richest (20%) by Rural and Urban Areas



Source: Pakistan Economic Survey 2007-08.

Source: ADB (2008) using the Pakistan Economic Survey 2007-08.

The rise in inequality during the last two decades can be a result of poor and inequitable economic growth. The decade of the 90s, economically speaking, considered Pakistan's lost decade⁴². Political instability, deterioration in governance, imprudent macroeconomic management, and lack of continuity in economic policies were the key factors behind this performance (ADB, 2008). This led to increasing reliance on the IMF and other International Financial Institutions (IFIs) for covering the yawning gaps in the country's accounts, which inevitably came with these IFIs specific structural adjustment prescriptions. The resulting adherence to the strict conditionalities in the form of increasingly regressive tax regime, shrinking development and pro poor programs and privatization of hitherto state-run utilities saw a sharp rise in poverty and inequality. The rich gained at the expense of the bottom and middle income groups ; the share in national income of the top 1 percent doubled from 10 to

⁴² As an indicator, the country's per capita income adjusted for purchasing power parity, which was 50 percent higher than India in 1990, fell below that of India in 2000.

20 during the 2000s. The country's services sector, that has been the main propeller of the country's sterling economic performance in the 2000s, has mostly provided jobs to the urban educated. This has not only accentuated the rural – urban disparities, but has also increased the level of income inequality between the well-educated rich and the semi/uneducated poor due to higher differential return to education (figure 4.1).

Here it needs to be mentioned that inequality in Pakistan manifests itself not only at the individual and family level, but also in its geographical and temporal dimensions. As an example of the inequality of opportunities, literacy rate on the district level, according to a 2007 estimate, varied from over 70% in Islamabad to 10% in Musa Khel and Kohistan.

4.2.4 Poverty, poverty of what?

Poverty has been the fate of most of the humanity for much of the human history. So much so that it was considered a natural and unavoidable phenomenon, deemed essential for the normal functioning of the society. In the words of Diderot: "Il faut que le peuple vive, mais il faut que sa vie soit pauvre et frugale: plus il est occupé, moins il est factieux, et il est d'autant plus occupé, qu'il a plus de peine à pouvoir à ses besoins." (Cited in Ragon 1974).

What what really is poverty?

There are several definitions of poverty. Poverty symbolises the inability of a person to attain a minimum standard of living (World Bank, 1990). This below-standard living prevents the individuals from attaining and satisfying their potential, thus limiting their capacities and capabilities. Poverty can thus be considered a function of absolute deprivation in terms of individual capabilities, the potential or personal advantage that a person can attain. Individual living standard, therefore, reflects the person's capabilities rather than the number of commodities he possesses or the level of utility he derives from their consumption (Sen 1976, 1993). A capability is a person's or group's freedom to promote or achieve valuable functionings. It represents the various combinations of functionings (beings and doings) that the person can achieve.

Poverty is often defined in terms of a given poverty line, the most common being the World Bank's \$1 a day poverty line (World Bank, 1990). This poverty line, referred to as the International poverty line, represents the monetary value of the minimum level of an individual's nutritional and energy consumption requirements, and corresponds to \$1 in 1985, \$1.08 in 1993 and \$1.25 per day in 2005 at purchasing power parity. It is close to the average of PPP-adjusted national poverty lines of the poorest 15 nations in the world (Ravallion et al. 2008). It is drawn either using the Food and Energy Intake (FEI) Method or the Cost-of-Basic Needs (CBN) Method. The FEI sets the poverty line by computing the consumption expenditure or income level at which food energy intake is just sufficient to meet pre-determined food energy requirements, whereas the CBN stipulates a consumption bundle that is seen as the adequate level for basic consumption needs proceeded by estimation of costs for each subgroup being compared (Dhongde and Minoiu, 2010). The poverty line is kept constant in real term to buy minimum calorie intake for an individual by taking the local inflation into account.

A poverty line can be absolute as well as relative.

The former measures the cost of a given standard of living and has a fixed value over time and space. Relative poverty, on the other hand, refers to the average standard of living in terms of the economy's income distribution, expressed as a function of the mean or median. Therefore, it judges an individual's relative position in the income distribution, and consequently, the person's inability to participate in the society. Relative poverty is commonly measured in the developed countries, its calculation in the poor countries being somewhat limited. As a result, much of the literature on the incidence of poverty in the developing countries pertains to absolute poverty (see for example Bhalla, 2002; Chen, Datt, and Ravallion, 1994; Chen and Ravallion 2004, 2007).

Globally, the incidence of absolute poverty is said to be on the decline in the recent decades. Today, a quarter of the population of the developing World lives under \$1.25 a day as opposed to almost half in 1980, even though the absolute numbers have not come down substantially (Chen and Ravallion, 2008).

The poverty figures estimated using the international poverty lines are sensitive to the consumer price indices used to draw or update the poverty lines; the purchasing power parity

exchange rates required to make incomes and expenditure levels comparable across countries; and the statistical techniques employed to estimate income distributions (Dhongde and Minoiu, 2010). These poverty lines may therefore not be useful for the study of poverty on the country or local level. As a result, the use of national poverty lines for country studies is widespread.

4.2.5 Measures of poverty

The Foster, Greer, Thorbecke (FGT) class of measures has, over the years, been commonly used for measuring poverty. Probably the most widely used among these measures is the Headcount ratio, which is a simple and intuitive measure. It measures the percentage of the population that falls below a given poverty line. The drawback of this measure is that it does not indicate the extent and severity of poverty, giving merely the level of population living below the poverty line. If a poor person becomes poorer, headcount remains unchanged. The Headcount ratio also violates the Dalton (1920) principle of transfer that states that transfers from a richer to poorer person should improve the measure of welfare (Anwar, 2005a).

Another measure of poverty is the poverty gap index, which gives the shortfall of income or consumption from the poverty line, and therefore, indicates the depth of poverty prevalent in the society. It is the gap between the poverty line and the average income of the poor expressed as a proportion of the poverty line. This measure, though useful for evaluating the extent or depth of poverty, does not take into account the severity of poverty among the poor.

This feature of poverty is captured by the Severity index, which is calculated by squaring the poverty gap index. By squaring the poverty gap index, the measure implicitly puts more weight on individuals that fall well below the poverty line (Anwar, 2005a).

Yet another measure is the Chronic poverty index, which uses the average level of consumption over the entire period as the underlying standard of living measure to examine the level of poverty (Jalan and Ravallion, 2000, Chronic Poverty Report, 2008).

As regards relative poverty, percentage of the mean or median of average income or percentage of quantiles are frequently used measures.

The above mentioned measures provide a unidimensional view of poverty. Following Sen's capability approach, some recent works have tried to devise multidimensional measures of well-being (see for example Bourguignon and Chakravarty, 2003 ; Tsui, 2002). Among the measures that attempt at assessing the multidimensional nature of poverty, the Human Poverty Index (HPI) and the Multi-dimensional Poverty Index are notable. For a detailed account of the measurement of poverty, see Anand, Segal, and Stiglitz (2007)

4.2.6 Poverty in Pakistan

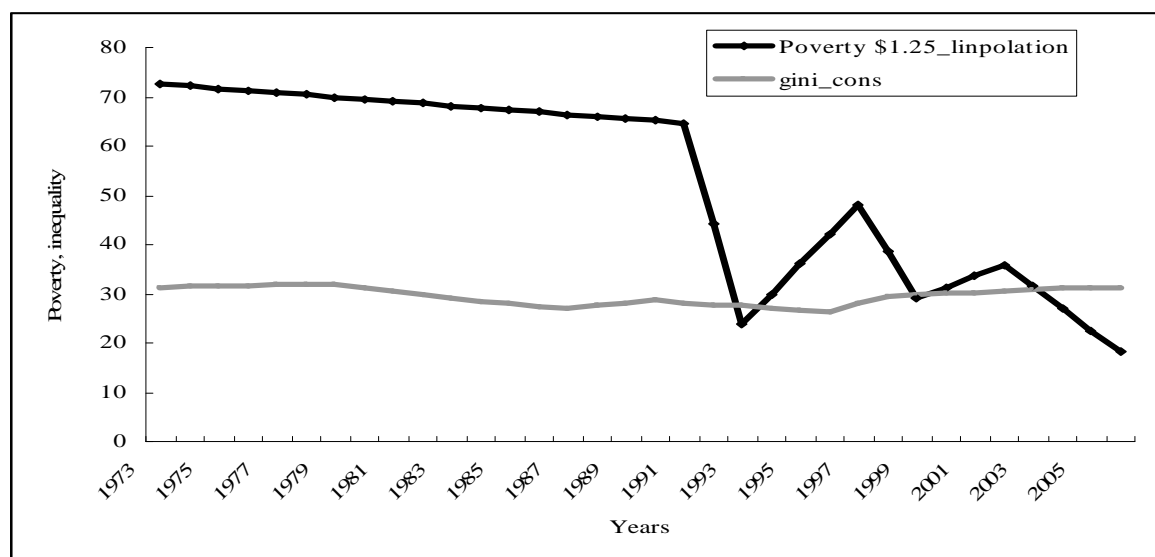
Outside Sub Saharan Africa, South Asia contains the largest concentration of absolute poor in the World. Like other South Asian countries, majority of Pakistan's citizens suffered from absolute poverty and illiteracy at the time of independence. The question of poverty has therefore been extensively studied in Pakistan. Naseem (1973) was the first study in this regard. Other studies include Alauddin (1975), Mujahid (1978), Amjad and Irfan (1984), Kruik and Leeuwen (1985), Malik (1988), Ahmad and Ludlow (1989), Zaidi (1992), World Bank (1995), Anwar (1996) And Qureshi and Arif (1999).

Recent studies include Asian Development Bank (2002) , Anwar (2002), World Bank (2003), Anwar, (2005b), World Bank (2007), and Arif and Faiz (2007). See Anwar (2005b) for a review of poverty literature on Pakistan. Most of these studies have examined the incidence of absolute poverty in the country. Zaidi (1992) and Anwar (2005b), however, estimate relative poverty.

The over all picture emerging from the literature is that poverty dropped in the 1960s, 1970s and 1980s, rose in the 90s and fell again in the early 2000s (figure 4.3). However, the gains have partially been reversed since the middle of the decade. Poverty reduction in the 1960s can be attributed to the Green revolution and strong growth in industrial and manufacturing sectors. In the 70s, the public sector expanded, providing better paid jobs, while in the 1980s, large inflows of worker remittances sent by millions of Pakistanis working in the Persian Gulf countries must have contributed in alleviating poverty. The country also received sizeable foreign development assistance in recognition of its frontline state role in the war in

Afghanistan against the Soviet Union. These two inflows kept the deficits in check and the resulting government and private consumption kept the growth rate high.

Figure 4.3. Evolution of inequality and poverty trends



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

In the 1990s, however, poverty began to rise. Possible reasons include low growth, inadequate development spending in order to control the ballooning budget deficit leading to fewer pro-poor subsidies, higher and more regressive taxes, shrinking of the public sector, debt servicing on the loans incurred from the international lenders, along with high Defence spending due to insecurity on the eastern borders. Political instability, corruption and nepotism also hindered the judicious use of development funds. Here, it is worth mentioning that during this period, Pakistan followed deregulation, privatization and spending cutting policies as a part of the Structural Adjustment Programs (SAPs) in order to avail loan facilities from the IMF and the World Bank.

In the 2000's, despite the revival of economic growth and sharp rise in remittances and FDI's, poverty has not abated, and after some years of falling poverty rates, poverty appears to have resumed its upward march. This could possibly be due to the services and capital-intensive industry led growth and the ensuing double digit inflation. The ongoing geopolitical instability and recurring natural disasters during the decade have worsened the situation.

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These factors may well have contributed to higher poverty through widening income and consumption gaps.

The measurement of poverty rates in the country has been contentious. For instance, according to official estimates, poverty fell from 34.5% in 2001-02 to 23.9% in 2004-05, a more than 10% drop in the span of three years. It turned out, however, that this was an statistical artifact made possible by the reduction of the minimum average calorie norm (used to set the national poverty line) from the International level of 2550 to 2150 calories per person per day. The average calorie intake requirement was set to 2350 calorie per adult equivalent per day in 2002. This change brought up the rate of poverty prevalence by 2%. World Bank (2006) and Anwar (2005b), using the latter threshold, found the poverty rate drop half that initially determined in the official estimates. World Bank (2006) found a poverty rate of 29.2% in 2004-05 using a different inflation rate. Anwar (2005b), employing a relative poverty line of 66.67% of the national average per capita expenditure found the poverty rate to be 40.3% in 2001-02, implying that 60 million individuals were poor in Pakistan; of which 46.1 and 14.4 million individuals were located in rural and urban areas, respectively. This shows a 6% rise in poverty as compared to 1994-95.

Part of the reason for such divergent poverty estimates is that a large proportion of the country's population, especially in the rural areas, lives on or just above the minimum per head income taken as the official poverty line. For instance, by using a higher cut-off point of 75 percent of national average per capita expenditure, Anwar (2005b) found a poverty rate of 52% for 2001-02. This highlights the importance of employing multiple poverty lines to measure the extent and depth of poverty in a developing country like Pakistan.

Leaving aside the issue of the magnitude of exact drop in poverty, it is generally agreed that poverty did fall in the first half of the 2000s. A high growth rate of about 7% sustained during the period, coupled with increased job creation in the urban areas and substantial foreign direct investment and remittance inflows must be the main causes behind this improvement. Besides, development and poverty alleviation expenditures increased from 3 percent of the GDP in 2001-02 to 5.7 percent of the GDP in 2007. Anecdotal evidence suggests that in the last couple of years, stagnant economic performance, persistent double-digit inflation, chronic fiscal deficit, shying away of foreign capital, poor law and order situation, and

natural disasters has led to reversal of poverty trends. The last factor deserves a special mention as the country faced two of its worst disasters linked to natural catastrophies during the last decade: the October 2005 earthquake, that killed over 70, 000 people and impoverished an already poor area of the country, and the massive summer 2010 floods which submerged upto 200, 000 sq. km. of the country at one point.

After this brief examination of inequality and poverty trends, now we consider the role of remittances in the story.

4.3 MICROECONOMIC ANALYSIS

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

4.3.1 Data and estimation method

The data in this study are taken from the Household Integrated Economic Survey (HIES) 2005-06 and 2007-08. This series of nationwide representative surveys, conducted as phase II of Pakistan Social and Living-Standard Measurement (PSLM) survey, comprises observations for over fifteen thousand households in each survey. The surveys were conducted by the Federal Bureau of Statistics (FBS), Government of Pakistan, Islamabad. The universe consists of all urban and rural areas of the four provinces of Pakistan defined as such by the 1998 Population Census. These surveys provide complete information on the quantity and expenditure on all food and non-food items.

According to the 2007-08 HIES, 4.3 percent of the population receives foreign remittances, while 8.4 percent households receive domestic remittances. Both income and consumption observations are available in the survey data. However, we rely on consumption data for constructing our poverty and inequality indicators. One reason for this preference is that consumption is less subject to short term economic shocks. Moreover, in developing countries, the presence of a large informal sector and large scale tax evasion means that incomes are usually underestimated. This causes income inequality to be on the lower side. Besides, in a country where close to half the population depends, directly or indirectly, on

agriculture for its income, vagary of weather can cause incomes to vary substantially. Consumption, in comparison, is less prone to short-term shocks, and can therefore give a better picture of inequality at a given point of time. Consumption can also be measured with less error. Besides, official poverty line in many developing countries, including Pakistan, is based on the minimum required caloric intake monetized to give individual consumption figures. Therefore, basing the inequality measure on consumption makes the analysis of poverty and inequality coherent.

We use the official poverty lines of Rs. 11333 (Ul Haq et al. 2008) and Rs. 11400⁴³ for the years 2005-06 and 2007-08 respectively to construct the three binary variables for poverty. These three variables are the headcount poverty rate, the poverty gap and the squared poverty gap. The first corresponds to the proportion of population below the poverty line; the second measures the total shortfall of consumption below the poverty line, while the last squares the poverty gap to estimate the severity of poverty. As regards inequality, we use Mean Log Deviation (MLD) as well as the five consumption quintiles. Our baseline poverty and inequality equation can be given as:

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

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

⁴³ Taken from http://www.finance.gov.pk/survey/chapter_10/09_Poverty.pdf
(page : 141)

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

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

Description of the above variables as well as their summary statistics are given in table 4.2.

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

Table 4.2. Summary statistics – microeconomic model

Table 1 -A - Summary Statistics

2005

VARIABLES	N	mean	sd	min	max
age	112,995	23.20	18.96	0	99
sex	112,995	0.499	0.500	0	1
married	112,995	1.432	0.586	1	5
femalehead	134,819	0.0105	0.102	0	1
hhsz	134,819	8.590	4.654	1	55
nworker18	79,650	4.454	2.449	0	22
enrollmentstatus	100,872	0.545	0.498	0	1
region	112,995	0.392	0.488	0	1
province	112,995	2.112	1.085	1	4
forrem	15,442	0.0571	0.232	0	1
intrem					
inc	131,143	115,915	151,586	0	4.500e+06
exp	134,768	109,712	98,988	0	2.522e+06
savings	87,461	46,212	178,366	10	2.000e+07
agri_land	100,252	0.128	0.334	0	1
expadeq14	134,768	18,516	18,594	0	630,596
p0_e14	134,819	0.372	0.483	0	1
p1_expadeq14	134,819	0.107	0.178	0	1
p2_expadeq14	134,819	0.042	0.094	0	1
mld	134,762	0.230	0.647	-3.135	7.553

Table 1 -B - Summary Statistics 2007

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
age	107,832	23.55	18.84	0	99
sex	107,832	0.504	0.500	0	1
married	107,832	0.361	0.480	0	1
femalehead	124,835	0.0119	0.109	0	1
hhszise	124,835	8.236	4.091	1	37
nworker18	73,247	4.382	2.270	0	16
enrollmentstatus	97,117	0.567	0.495	0	1
region	108,469	0.391	0.488	0	1
province	108,469	2.126	1.105	1	4
forrem	8,136	0.0431	0.203	0	1
intrem	9,118	0.0838	0.277	0	1
inc	124,830	142,101	223,774	1	1.022e+07
exp	124,830	132,429	112,489	1,700	2.644e+06
savings	93,287	85,070	478,911	0	3.000e+07
agrilandownership	15,511	0.0896	0.286	0	1
expadeq14	124,830	22,983	21,424	340	678,343
p0_e14	124,835	0.216	0.411	0	1
p1_expadeq14	124,835	0.050	0.123	0	0.970
p2_expadeq14	124,835	0.017	0.058	0	0.941
Mld	124,830	0.202	0.609	-2.994	4.355

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

4.3.2 Remittances and Poverty:

Our 2007-08 dataset indicates a poverty headcount rate of 21.55 percent, which is 1.1 percent lower than the subset with remittance receiving households excluded. The difference in the poverty depth and severity is also striking, the two indicators dropping from 5.36% and 1.94% (dataset with foreign remittances-receiving households excluded) to 5.05% and 1.77% respectively (dataset including foreign remittance-receiving households). The corresponding fall in poverty headcount rate, gap and squared gap for the 2005-06 dataset is even more significant at 13.8%, 5.2% and 1.9% respectively.

Controlling for other drivers of poverty using the aforementioned equation, these strong poverty-alleviating effects are confirmed (see table 4.3). Foreign remittances show a strong and significant poverty reducing probability of -0.58 and 0.99 for 2007-08 and 2005-06 respectively, both significant at 1%. Only the urban-rural residence variable shows an equally strong probability. Remittance-receiving households have an 18.4 percent marginal probability of being below the official poverty line *ceteris paribus*, as opposed to 30.1 percent for the non-recipient households (2007-08 results). This means that depending on the specification used, between 800,000 to 1.6 million persons could go above the poverty line in 2007-08 thanks to foreign remittances⁴⁴. The corresponding figures for 2005-06 are even higher, ranging from 2 to 2.9 million fewer poor⁴⁵.

Results pertaining to the depth and severity of poverty are similarly significant, and rival those of the household's rural-urban location. All the results for poverty are stronger using the 2005-06 survey dataset than the 2007-08 one.

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

⁴⁴ Calculated using the official population estimate of 153,960,000.

⁴⁵ Calculated using the official population estimate of 159,060,000.

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Table 4.3. Foreign Remittances and Poverty – baseline model

	2005			2007		
VARIABLES	p0_e14	p1_expadeq14	p2_expadeq14	p0_e14	p1_expadeq14	p2_expadeq14
forrem	-	-0.079***	-0.037***	-	-0.038***	-0.015***
	0.943***			0.582***		
	(0.099)	(0.007)	(0.003)	(0.180)	(0.009)	(0.004)
hhsiz	0.209***	0.0206***	0.00924***	0.239***	0.0132***	0.00444***
	(0.009)	(0.0007)	(0.0004)	(0.013)	(0.0009)	(0.0004)
femalehead	-	-0.055***	-0.018*	-0.782	-0.052***	-0.022***
	0.738***					
	(0.173)	(0.016)	(0.010)	(0.492)	(0.017)	(0.006)
nworker18	-	-0.015***	-0.006***	-	-0.007***	-0.001**
	0.133***			0.135***		
	(0.011)	(0.001)	(0.0007)	(0.021)	(0.001)	(0.0007)
age	-	0.0001	0.0001*	-0.004**	-0.0002	-5.75e-05
	0.004***					
	(0.001)	(0.0001)	(7.34e-05)	(0.002)	(0.0001)	(8.17e-05)
married	0.148***	0.004	0.0003	0.103	0.003	-0.0003
	(0.050)	(0.004)	(0.002)	(0.0702)	(0.005)	(0.002)
enrollmentstatus	-	-0.067***	-0.029***	-	-0.037***	-0.013***
	0.592***			0.517***		
	(0.034)	(0.003)	(0.002)	(0.064)	(0.005)	(0.002)
lninc	-	-0.019***	-0.010***	-	-0.006***	-0.002***
	0.190***			0.109***		
	(0.018)	(0.001)	(0.001)	(0.019)	(0.001)	(0.0005)
lnsaving	-	-0.022***	-0.009***	-	-0.026***	-0.010***
	0.302***			0.493***		
	(0.015)	(0.001)	(0.0007)	(0.028)	(0.001)	(0.0009)
region	-	-0.080***	-0.034***	-	-0.059***	-0.023***
	0.783***			0.916***		
	(0.033)	(0.003)	(0.001)	(0.065)	(0.004)	(0.001)
province	0.034**	-0.001	-0.002***	-	-0.003	-0.0009

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Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				0.071***			
	(0.013)	(0.001)	(0.0008)	(0.027)	(0.002)	(0.001)	
	Constant	4.444***	0.550***	0.246***	5.235***	0.412***	0.160***
	(0.233)	(0.021)	(0.013)	(0.366)	(0.026)	(0.012)	
Observations	8,902	8,902	8,902	2,844	2,844	2,844	
R-squared		0.346	0.259		0.274	0.188	

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

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Table 4.4. Foreign Remittances and Poverty – alternative model

VARIABLES	2005			2007		
	p0_e14	p1_expadeq14	p2_expadeq14	p0_e14	p1_expadeq14	p2_expadeq14
forrem	-	-0.120***	-0.058***	-2.219**	-0.115**	-0.057**
	1.291***					
	(0.099)	(0.007)	(0.004)	(1.035)	(0.046)	(0.026)
hhsize	0.211***	0.024***	0.011***	0.234***	0.016***	0.006***
	(0.008)	(0.0007)	(0.0004)	(0.042)	(0.003)	(0.001)
femalehead	-	-0.068***	-0.024**		-0.130***	-0.063***
	0.628***					
	(0.149)	(0.017)	(0.011)		(0.033)	(0.021)
nworker18	-	-0.020***	-0.008***	-	-0.012***	-0.004
	0.162***			0.174***		
	(0.010)	(0.001)	(0.0008)	(0.059)	(0.004)	(0.002)
age	-	-0.0001	2.92e-05	-0.001	-8.62e-05	4.51e-07
	0.004***					
	(0.001)	(0.0001)	(8.19e-05)	(0.004)	(0.0003)	(0.0001)
married	0.138***	0.012**	0.005**	0.136	-0.009	-0.006
	(0.047)	(0.005)	(0.002)	(0.166)	(0.012)	(0.006)
enrollmentstatus	-	-0.076***	-0.035***	-	-0.046***	-0.015***
	0.609***			0.783***		
	(0.030)	(0.003)	(0.002)	(0.155)	(0.012)	(0.005)
lninc	-	-0.029***	-0.016***	-	-0.016***	-0.009**
	0.224***			0.170***		
	(0.018)	(0.001)	(0.001)	(0.058)	(0.006)	(0.004)
Agri_land	-	-0.049***	-0.023***	-0.590**	-0.036**	-0.019**
	0.472***					
region				(0.269)	(0.016)	(0.007)
	-	-0.098***	-0.044***	-	-0.062***	-0.025***
	0.796***			0.854***		
	(0.029)	(0.003)	(0.001)	(0.158)	(0.010)	(0.005)

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province	0.015	-0.002*	-0.002***	-0.052	-0.006	-0.002
	(0.013)	(0.001)	(0.0008)	(0.066)	(0.005)	(0.002)
Constant	2.229***	0.453***	0.230***	1.165*	0.269***	0.138***
	(0.208)	(0.021)	(0.014)	(0.679)	(0.074)	(0.052)
Observations	10,545	10,545	10,545	516	523	523
R-squared		0.335	0.258		0.265	0.204
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

We also estimate an alternative model taking agricultural land ownership as proxy for household wealth. The results (shown in table 4.4) are similar, with highly significant negative impact for all the three indicators of poverty. In this model, foreign remittance-reciept becomes the single most important factor behind the likelihood of the household being not poor. Foreign remittance-receiving households, for instance, appear to have a 24% and 32.9% lower marginal probability of being below the official poverty line in 2005-06 and 2007-08 respectively.

When compared with internal remittances (table 4.5), foreign remittances show a similarly strong association with the likelihood of being poor (baseline model). However, when agricultural land ownership is taken as proxy for household wealth, the relationship becomes weak and loses all statistical significance.

Table 4.5. Internal Remittances and Poverty

VARIABLES	Baseline model			Alternative model		
	p0_e14	p1_expadeq14	p2_expadeq14	p0_e14	p1_expadeq14	p2_expadeq14
intrem	-	-0.028***	-0.012***	-0.063	-0.011	-0.010
	0.672***					
	(0.153)	(0.007)	(0.003)	(0.251)	(0.018)	(0.009)
hhsize	0.171***	0.010***	0.003***	0.209***	0.015***	0.006***
	(0.014)	(0.0009)	(0.0004)	(0.036)	(0.003)	(0.001)
femalehead	-0.800**	-0.058***	-0.026***	-	-0.116***	-0.056**
				1.629***		
	(0.352)	(0.013)	(0.005)	(0.611)	(0.040)	(0.022)
nworker18	-	-0.005***	-0.0008	-	-0.011***	-0.003
	0.105***			0.169***		
	(0.020)	(0.001)	(0.0007)	(0.055)	(0.004)	(0.002)
age	-0.004**	-0.0003**	-0.0001	-0.004	-0.0003	-0.0001
	(0.001)	(0.0001)	(7.66e-05)	(0.004)	(0.0003)	(0.0001)
married	0.111*	0.005	0.001	0.189	-0.003	-0.003
	(0.065)	(0.004)	(0.002)	(0.154)	(0.011)	(0.006)
enrollmentstatus	-	-0.038***	-0.014***	-	-0.047***	-0.016***
	0.493***			0.734***		
	(0.060)	(0.005)	(0.002)	(0.140)	(0.011)	(0.005)
lninc	-	-0.004***	-0.002***	-	-0.011***	-0.006***
	0.052***			0.085***		
	(0.014)	(0.001)	(0.0005)	(0.032)	(0.004)	(0.002)
lnsaving	-	-0.026***	-0.010***			
	0.430***					
agrilandownership		(0.026)	(0.001)			
			(0.0009)			
				-0.614**	-0.037***	-0.019***
region				(0.240)	(0.014)	(0.006)
	-	-0.058***	-0.022***	-	-0.059***	-0.024***
	0.896***			0.861***		

evidence

	(0.058)	(0.004)	(0.001)	(0.140)	(0.010)	(0.004)
province	-0.055**	-0.004**	-0.001	-0.039	-0.004	-0.001
	(0.025)	(0.002)	(0.001)	(0.062)	(0.005)	(0.002)
Constant	4.333***	0.408***	0.164***	0.353	0.226***	0.112***
	(0.317)	(0.025)	(0.013)	(0.455)	(0.054)	(0.034)
Observations	3,179	3,179	3,179	598	598	598
R-squared		0.252	0.176		0.239	0.184
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

4.3.3 Remittances and Inequality

Households in our survey data have an overall consumption Gini index of 34.76 in the 2007-08 dataset, which is slightly above 33.54 for the sample excluding foreign remittance-receiving households the corresponding figures for 2005-06 being 35.65 and 35.49 respectively). However, once other determinants of inequality are controlled for, we get a different picture (table 4.4). The coefficient for Mean Log Deviation is negative and significant at 1%, ranging from 0.30 (2005-06) to 0.32 (2007-08). Similar to the poverty results, foreign remittances appear. Similar to the poverty results, foreign remittances appear to have the strongest association with consumption inequality after the household's residence in urban or rural area. Living in a particular province does not appear to be an important factor in determining the incidence of either poverty or expenditure inequality. The divide is rather mainly between the country's urban and rural areas, with urban areas being less poor and more equal.

Table 4.6. Foreign Remittances and Inequality

2005-06						
VARIABLES	Bottom quintile	q_e2	q_e3	q_e4	Top quintile	mld
Forrem	-0.836***	-	-	0.155**	0.796***	-
		0.436***	0.201***			0.304***
	(0.147)	(0.087)	(0.073)	(0.067)	(0.088)	(0.024)
hhsiz	-0.234***	-0.016**	0.020***	0.048***	0.072***	-
						0.041***
	(0.010)	(0.006)	(0.005)	(0.006)	(0.007)	(0.001)
femalehead	-0.762***	-0.168	0.128	-0.044	0.621***	-
						0.254***
	(0.168)	(0.138)	(0.133)	(0.146)	(0.238)	(0.056)
nworker18	-0.058***	-	-	-0.004	0.097***	-
		0.089***	0.053***			0.024***
	(0.016)	(0.012)	(0.011)	(0.011)	(0.013)	(0.003)
age	-0.003**	-0.002**	0.001	0.005***	0.006***	-
						0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0003)
married	0.043	0.043	-0.049	-0.119**	-0.190***	0.058***
	(0.059)	(0.052)	(0.049)	(0.049)	(0.061)	(0.015)
enrollmentstatus	-0.521***	-	0.012	0.335***	0.657***	-
		0.277***				0.241***
	(0.041)	(0.035)	(0.035)	(0.036)	(0.047)	(0.009)
lninc	-0.182***	-	-0.006	0.001	0.251***	-
		0.073***				0.093***
	(0.016)	(0.010)	(0.010)	(0.011)	(0.039)	(0.007)
lnsaving	-0.270***	-	-	0.019	0.381***	-
		0.111***	0.049***			0.146***
	(0.018)	(0.013)	(0.012)	(0.012)	(0.020)	(0.004)
region	-1.017***	-	0.027	0.277***	0.747***	-
		0.295***				0.338***
	(0.047)	(0.034)	(0.033)	(0.033)	(0.041)	(0.009)
province	-0.018	-0.005	0.018	0.025*	-0.051***	0.007*
	(0.017)	(0.014)	(0.013)	(0.013)	(0.016)	(0.003)
Constant	6.145***	1.805***	-0.255	-	-9.350***	3.420***
				1.814***		
	(0.271)	(0.178)	(0.166)	(0.169)	(0.421)	(0.0776)
Observations	8,902	8,902	8,902	8,902	8,902	8,902
R-squared						0.570
Robust standard errors in parentheses						

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2007-08						
VARIABLES	Bottom quintile	q_e2	q_e3	q_e4	Top quintile	mld
forrem	-1.148***	-0.323*	-0.317**	0.303**	0.683***	-
	(0.442)	(0.181)	(0.156)	(0.119)	(0.121)	0.325***
hhsz	-0.186***	0.009	0.017	-0.007	0.068***	-
	(0.022)	(0.012)	(0.011)	(0.010)	(0.011)	0.025***
femalehead	-0.294	-0.167	-0.754*	-0.167	0.857**	-0.235**
	(0.434)	(0.356)	(0.397)	(0.297)	(0.416)	(0.106)
nworker18	-0.017	-	-0.037*	0.038**	0.084***	-
	(0.030)	0.153***	(0.020)	(0.019)	(0.022)	0.029***
age	-0.006**	-0.002	0.001	-0.001	0.006***	-
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	0.002***
married	0.101	0.139*	-0.065	-0.080	-0.080	0.033*
	(0.091)	(0.076)	(0.062)	(0.058)	(0.069)	(0.017)
enrollmentstatus	-0.689***	-	-0.061	0.152***	0.625***	-
	(0.086)	0.233***	(0.062)	(0.058)	(0.070)	0.234***
lninc	-0.120***	-	-	0.015	0.119***	-
	(0.027)	0.040***	0.060***	(0.017)	(0.027)	0.061***
lnsaving	-0.376***	-	-	0.030	0.467***	-
	(0.034)	0.158***	0.100***	(0.022)	(0.030)	0.171***
region	-0.962***	-	-	0.131**	0.823***	-
	(0.087)	0.277***	0.154***	(0.054)	(0.062)	0.342***
province	-0.142***	0.036	-0.018	0.021	0.033	-0.005
	(0.039)	(0.029)	(0.024)	(0.023)	(0.026)	(0.006)
Constant	6.590***	1.800***	1.073***	-	-9.256***	3.319***
	(0.503)	(0.331)	(0.279)	1.431***	(0.465)	(0.103)
Observations	2,844	2,844	2,844	2,844	2,844	2,844
R-squared						0.533
Robust standard errors in parentheses						

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Results given in Table 4.6 also show foreign remittances' association with the likelihood to belong to various consumption quintiles. Foreign remittances are positively related to the upper quintiles, especially the top one, and negatively associated with the lower ones. Compared with these findings, domestic remittances show a rather weak negative association with consumption inequality (table 4.7), the coefficient being a low 0.07 (2007-08). This is also evident from the quintile-wise results, with internal remittances showing a significantly negative relationship with the probability of belonging to the bottom quintile and a significant positive one with the one above it, while the remaining three quintiles remain unaffected. This interaction of domestic remittances with inequality is markedly different from that of foreign remittances. The former appear to be evenly distributed in our sample, with 23 percent to be the highest share for any quintile. The reason for this difference is probably that unlike overseas Pakistani workers, internal migrants, particularly the poorest ones, do not earn enough to be able to move up the economic ladder.

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Table 4.7. Internal Remittances and Inequality (2007-08)

VARIABLES	Bottom quintile	q_e2	q_e3	q_e4	Top quintile	mld
intrem	-0.583*** (0.148)	0.246** (0.101)	-0.157 (0.105)	0.051 (0.091)	0.138 (0.111)	-0.070** (0.029)
hhsz	-0.197*** (0.022)	0.005 (0.011)	0.010 (0.010)	-0.012 (0.009)	0.069*** (0.010)	-0.029*** (0.002)
femalehead	-0.416 (0.290)	-0.299 (0.224)	-0.381 (0.240)	0.046 (0.201)	0.454* (0.267)	-0.225*** (0.069)
nworker18	-0.016 (0.030)	- (0.022)	-0.039** (0.019)	0.043** (0.018)	0.082*** (0.020)	-0.030*** (0.005)
age	-0.005** (0.002)	-0.001 (0.002)	0.0009 (0.001)	-0.0009 (0.001)	0.006*** (0.001)	-0.002*** (0.0005)
married	0.111 (0.088)	0.096 (0.070)	-0.065 (0.059)	-0.075 (0.055)	-0.047 (0.064)	0.027 (0.017)
enrollmentstatus	-0.671*** (0.083)	- (0.065)	-0.044 (0.059)	0.136** (0.055)	0.585*** (0.065)	-0.228*** (0.015)
lninc	-0.059*** (0.014)	-0.019* (0.011)	-0.014 (0.013)	0.008 (0.013)	0.046** (0.018)	-0.034*** (0.005)
lnsaving	-0.411*** (0.033)	- (0.024)	- (0.020)	0.037* (0.020)	0.475*** (0.028)	-0.175*** (0.006)
region	-1.018*** (0.086)	- (0.063)	- (0.055)	0.179*** (0.051)	0.782*** (0.058)	-0.348*** (0.014)
province	-0.139*** (0.038)	0.033 (0.028)	-0.012 (0.023)	0.029 (0.022)	0.034 (0.025)	-0.008 (0.006)
Constant	6.274***	1.782***	0.574**	- 1.440***	- 8.379***	3.086***

evidence

	(0.416)	(0.298)	(0.249)	(0.252)	(0.395)	(0.088)
Observations	3,179	3,179	3,179	3,179	3,179	3,179
R-squared						0.513
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

The above results certainly give us some indications of the interaction between remittances and inequality. However, these are valid only as far as migrants and migrant households are considered as randomly drawn from the sample, without any selection bias. Remittance-receiving households may however not be randomly selected, and may differ from non-migrant households in such characteristics as motivation to work, ability and skills (Cobb-Clark 1993). These unobserved features might not only influence a household's likelihood to receive remittances, but could also affect their earnings and consumption, and subsequently, the household's place in the consumption distribution. This can potentially bias our results. One way to check the randomness or not of the migrant households is to look at the figures of wealth inequality. Wealth accumulates over a matter of time, and thus reflects the household's previous earnings at a given instant. If the Gini index of wealth is lower for the sample including foreign remittances as compared to the one without them, it will suggest that the migrants generally came from lower income groups. In our 2007-08 dataset, Gini index for agricultural land ownership, taken as a proxy for household wealth, drops by 0.6 from 91.6 to

91 when foreign remittance receiving households are included in the sample. Similarly, the Gini index of home ownership decreases by 1.6 points. The corresponding reduction in Gini index for 2005-06 is 0.75 and 1.38 points respectively. Similarly, Gini index for accumulated savings falls by a sizeable 11.1 points in 2005-06, from 70.4 to 59.3.

A more appealing way of dealing with the potential self-selection problem is by using the propensity matching technique (PSM). The method consist of matching persons from remittance-receiving households with those from non-remittance-receiving ones but similar observable characteristics (household size, female headship, education status, savings, urban

orr rural setting, and province of residence). First, the probability of receiving remittances given various household covariates is estimated using a probabilistic model such as probit. This gives us the propensity scores for observed covariates by ranking individuals from receiving and non-receiving households. From this, difference between labour participation of treated group (individuals from remittance-receiving households) and non-treated group (individuals from non-remittance-receiving households) is calculated. This difference is averaged out to give the Average Treatment effect on the Treated (ATT).

Table 4.8 gives the results of propensity score matching estimations using the Kernel estimator. We find that the upper two quintiles both have a negative average treatment effect and the three a positive one in both of our survey datasets. This goes to confirm our previous findings that foreign remittances make the consumption distribution more equal. The ATT for domestic remittances still show a muddled picture, with the first, third and fifth quintiles showing a negative sign and the second and forth a positive one.

Table 4.8. Remittances and Inequality – Kernel Propensity Score Matching estimation

Foreign Remittances									
	2005					2007			
	Treated	Controls	Difference	S.E.		Treated	Controls	Difference	S.E.
Forrem (q_e1)	0.05	0.14	-0.09	0.01	Forrem (q_e1)	0.05	0.09	-0.04	0.02
Forrem (q_e2)	0.09	0.17	-0.08	0.01	Forrem (q_e2)	0.09	0.12	-0.03	0.03
Forrem (q_e3)	0.16	0.18	-0.02	0.02	Forrem (q_e3)	0.12	0.28	-0.16	0.03
Forrem (q_e4)	0.28	0.21	0.08	0.02	Forrem (q_e4)	0.33	0.24	0.09	0.04
Forrem (q_e5)	0.42	0.30	0.12	0.02	Forrem (q_e5)	0.41	0.26	0.14	0.04
Internal Remittances									
2007									
				Treated	Controls	Difference		S.E.	
intrem (q_e1)				0.09	0.12	-0.03		0.02	
intrem (q_e2)				0.22	0.16	0.06		0.02	
intrem (q_e3)				0.16	0.20	-0.04		0.02	
intrem (q_e4)				0.26	0.24	0.02		0.02	
intrem (q_e5)				0.27	0.28	-0.01		0.03	

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

4.4 MACROECONOMIC ANALYSIS

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

4.4.1 Data and Methodology

A. Data sources

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

Even though economic inequality can move in either direction relatively quickly following an economic shock (e.g. China in the last thirty years, or the ex-Communist countries of East and Central Europe during the 1990's), within-country inequality is normally considered a slow-moving variable. In Pakistan, inequality, as measured by consumption Gini, remained in the range between 0.26 and 0.35 during the 29 year period from 1979 to 2007-8 examined in this section, with a standard deviation of 0.03. This can warrant the use of standard interpolation techniques without a great loss of variance. We use consumption Gini figures for this purpose, and construct our inequality series using 12 available observations. Nevertheless, the results of empirical analysis using this interpolated regressand need to be interpreted with caution.

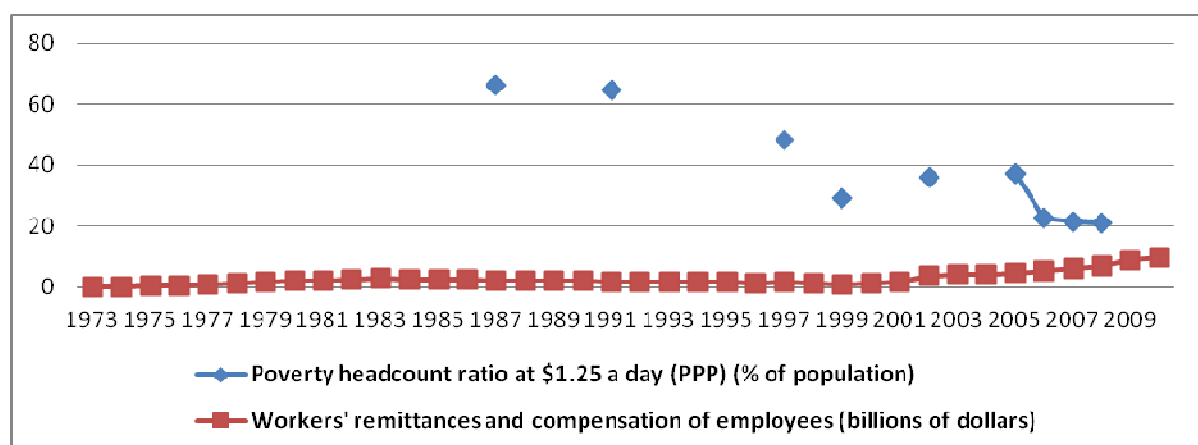
Ten observations for income inequality are also available (with a higher standard deviation of 0.042). However, we prefer consumption inequality series for reasons described in section 4.3.1.

The inequality figures used in our study have been taken from the UNU-WIDER *World Income Inequality Database* (WIID, 2010). Low-quality non-representative inequality data

(those ranked 4 in the WIID database) have been excluded. Care has been taken to only select the observations which appear coherent and reliable, and correspond to the changing economic realities.

Unlike inequality, poverty responds more readily to economic circumstances of the time and can thus fluctuate substantially. A major supply shock or a natural disaster can push millions in the ranks of the poor, and a short growth can help many at or just below the poverty line to cross the threshold. Pakistan's poverty headcount rate varied between 20 percent or less in late 1980s, according to some estimates, and over 35 percent in early 2000s. Besides, poverty figures for Pakistan are quite fickle. For instance, according to the World Bank World Development Indicators 2010, the poverty headcount ratio moved by an incredible 19% in a span of just two years, from 48.14% in 1996 to 29.05% in 1999. This fall follows a 16% drop in poverty in the previous six years, which is equally implausible, as this decade of low growth, fiscal deficits, large floods and crop failures probably accompanied a rise, and not a fall in poverty. Given the above mentioned volatility and imprecise nature of poverty measurement, it is unfeasible to construct an interpolated poverty time series. Consequently, we are unable to examine the remittances' association with poverty in their temporal dimension. Figure 4.4 shows the course of remittance and headcount poverty in the recent years. The two variables, as seen in the figure, appear to move in opposite direction to each other.

Figure 4.4. Worker's remittances and headcount poverty



Source: World Bank (2010)

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The remittances data are taken from the State Bank of Pakistan. Remittances are taken both as aggregate and with respect to their provenance, and are grouped with respect to three sending regions, namely North America, Europe and the Persian Gulf. The three regional variables are constructed by adding their constituent countries in case of Gulf and North America, and the top three remitting countries in the case of Europe. The countries are : Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (Persian Gulf), Canada and the United States of America (North America), and Germany, Norway and the United Kingdom (Europe).

The remaining variables come from the World Bank World Development Indicator database. Descriptive statistics of the dataset are given in table 4.9.

Table 4.9. Summary statistics – macroeconomic model

VARIABLES	N	mean	sd	min	max
Consumption Gini index	12	29.95	3.001	26.30	35.65
Consumption Gini index (interpolated)	29	29.58	2.472	26.30	35.65
gdp_growth__annual__	29	5.289	2.131	1.014	10.22
merchandise_trade____of_gdp_	29	31.03	3.166	25.59	37.78
Population growth (annual %)	29	2.534	0.193	2.142	2.996
School enrollment. primary (% gross)	24	60.64	15.36	40	86.18
School enrollment primary (interpolated)	29	61.98	15.09	40	86.18
CPI	29	67.02	39.81	18.91	149.2
structural_change	29	1.087	0.170	0.758	1.418
Workers' remittances and compensation of employees. received (current millions of US\$)	29	2,301	1,144	983.7	5,493
gulf	29	1,351	591.2	640.9	2,647
europa	29	228.6	115.6	89.34	529.0
North_america	29	370.5	472.0	60.59	1,547

B. Econometric specification

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

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

where INEQ is a given year's Gini inequality measure, REM is remittances and X the vector of other variables included in the regressions. ε is the error term. We also estimated a dynamic version of the model. However, this model was dropped as the addition of lagged inequality variable caused problems of multicollinearity and excessively high R^2 values.

In the following, we briefly describe the regressors in our model, and their *raison d'être*:

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

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

rural population. However, if the inflationary spell hurts the urban poor disproportionately, it may equally cause inequality to rise (Roine et al 2009).

Population growth is another factor significantly affecting inequality. Pakistan has entered the demographic dividend phase⁴⁶ after some decades of high population growth. High population growth among the poor may have raised the level of income disparity in the country. This increase could exasperate the already high dependency ratio, thus raising the financial burden on the less well-off households.

Just like the country's demography, Pakistan's economy has also greatly evolved in the last three decades. The share of agriculture has dropped from 30% to about 20%, while that of the industrial sector has moved up from 23 to 26% (SBP 2011). As shown in the microeconomic analysis in the previous section, poverty and inequality in Pakistan is strongly associated with the rural, predominantly agricultural areas. Change in sectoral distribution may therefore impact the country's inequality scenario as well. We include the ratio of agricultural to industrial value-added in the national output to count for this potential driver of inequality.

We also add in our model an indicator for natural catastrophes, given the significant ways in which they can alter the production levels of an economy, and consequently, the welfare of the population. As explained in Chapter 3, our disaster variable is a dummy variable which takes the value of one for a loss of 1000 or more lives, loss of \$1 billion or 1 million casualties in any given year. In our studied period, six years (1992, 1996, 1998, 1999, 2005 and 2007) meet the above criteria, either due to severe flooding or the 7.6 magnitude earthquake in 2005.

In addition to the variables included in the equation, poverty can be another potential factor significantly interacting with a country's inequality. However, due to aforementioned data problems, we do not include headcount poverty in our model.

⁴⁶ Pakistan entered the demographic dividend phase around 1990 and will probably not come out of it till 2045 (Nayab, 2007)

4.4.2 Foreign Remittances and Inequality

The results given in Table 4.10 show that population growth rate is by far the strongest determinant of inequality in our model. Its sign is expectedly positive, indicating that demographic change has played a significant role in the evolution of inequality in Pakistan. Inflation is another factor strongly associated with inequality in Pakistan. It appears to hurt the poor disproportionately, acting as a regressive tax on them through higher relative prices of edibles. While the owners of agricultural land and investment capital are shielded from its negative effects, inflation hits the poor by further lowering their purchasing power.

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Table 4.10. Foreign remittances and Inequality – Macroeconomic Analysis

	(1)	(2)
VARIABLES	gcon2	gcon2
Lgulf		-1.739 (2.013)
Lnorth america		-3.058*** (0.764)
Leurope		8.148*** (2.995)
Population growth annual	7.693* (4.072)	10.66*** (4.008)
prim2	-0.111*** (0.042)	-0.055 (0.056)
Gdp growth annual	0.125 (0.176)	-0.186 (0.193)
Cpi	0.111*** (0.014)	0.148*** (0.023)
Merchandise trade of gdp	0.224* (0.118)	-0.095 (0.190)
Structural change	2.275 (2.823)	2.407 (4.010)
Disaster	-0.116 (0.855)	0.055 (0.658)
Lrem	1.030 (0.682)	
Constant	-22.69 (19.55)	-63.57** (29.21)
Observations	28	28
R-squared	0.791	0.784
Robust standard errors in parentheses		

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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

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

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

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

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

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

4.5 CONCLUDING REMARKS

In this study, we attempted to analyse the relationship between remittance inflows and inequality and poverty in Pakistan. We find support for two out of four hypotheses. Remittances to Pakistan do appear to lower poverty substantially (H1). Not only has the probability of being poor decreased, but the depth and severity of poverty has also gone down. Receiving foreign remittances reduces the marginal likelihood of the household being below the official poverty line substantially by 12 to 32 percent, depending on the year and the models used. These findings are in line with the self-employment-promoting effects of foreign remittances shown in previous chapter. Remittances improve migrant households' economic conditions, and allow them the possibility to start their own businesses.

As hypothesized, we found mixed results for Gulf and European remittances (H3). Transfers from the GCC states show a negative (though statistically insignificant) impact on inequality, while those from Europe show a positive one.

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

Our forth hypothesis, the one pertaining to over all inequality, is partly validated. We do not find a clear-cut and significant impact of foreign remittances on inequality during the last three decades (macro analysis). This may owe, in part, to the

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difference in signs, magnitudes and significance of the corresponding impacts of remittances coming from the three major remitting regions. Nevertheless, the impact on inequality, as found in the microeconomic analysis using the 2005-06 and 2007-08 household survey data, is substantial and beneficial. Receipt of remittances is associated with lower consumption inequality.

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

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

“No known schooling intervention, road project, anti-sweatshop campaign, microcredit program, investment facility, export promotion agency, or any other in situ development program can surely and immediately raise the earning power of a large group of very poor people to anywhere near this degree.” (Clemens, 2010)

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

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

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To sum up, we state that remittances have, in the past, helped reduce poverty in Pakistan and made the country more egalitarian. However, some caution is in order: over-reliance on remittances may induce dependency mindset in the population, which may preclude growth through productive investments. Using remittances as a permanent source of poverty alleviation is a strategy fraught with risks as the levers of such development are bound to be away from the country, in the hands of foreign governments which often find themselves facing popular public pressure to protect local jobs at the cost of foreign labour. For improving the plight of the poor, none can beat a thoughtfully planned, well-executed, far-reaching home-grown development program.

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APPENDIX

APPENDIX A. MARGINAL PROBABILITIES:

Remittances and poverty headcount

Foreign remittances		Internal remittances			
2005		2007		2007	
Baseline model	Alternate model	Baseline model	Alternate model	Baseline model	Alternate model
		.301***	.255***	.291***	.236***
0 .458*** (.004)	.508*** (.004)	(.006)	(.015)	(.006)	(.015)
		.184***		.153***	.223***
1 .226*** (.019)	.178*** (.018)	(.030)	.015 (.024)	(.025)	(.050)

Foreign remittances and consumption quantiles

2005				
q1	q2	q3	q4	q5
			.203***	.207***
0 .187*** (.003)	.192*** (.004)	.205*** (.004)	(.004)	(.003)
			.248***	.381***
1 .076*** (.013)	.102*** (.014)	.153*** (.016)	(.019)	(.020)
2007				
q1	q2	q3	q4	q5
			.203***	.207***
0 .187*** (.003)	.192*** (.004)	.205*** (.004)	(.004)	(.003)
			.248***	.381***
1 .076*** (.013)	.102*** (.014)	.153*** (.016)	(.019)	(.020)

APPENDIX B. DIAGNOSTIC TESTS

B1. Tests for microeconomic models

Poverty headcount baseline model

2005

Probit model for p0_e14

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	2957	950	3907
-	1039	3956	4995
-----+-----+-----			
Total	3996	4906	8902

Classified + if predicted $\Pr(D) \geq .5$

True D defined as p0_e14 != 0

Sensitivity	$\Pr(+ D)$	74.00%
Specificity	$\Pr(- \sim D)$	80.64%
Positive predictive value	$\Pr(D +)$	75.68%
Negative predictive value	$\Pr(\sim D -)$	79.20%

False + rate for true ~D	$\Pr(+ \sim D)$	19.36%
False - rate for true D	$\Pr(- D)$	26.00%
False + rate for classified +	$\Pr(\sim D +)$	24.32%
False - rate for classified -	$\Pr(D -)$	20.80%

Correctly classified 77.66%

Probit model for p0_e14, goodness-of-fit test

number of observations = 8902

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number of covariate patterns = 8899
Pearson chi2(8887) = 163405.18
Prob > chi2 = 0

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	8902	-6123.803	-4178.724	12	8381.448	8466.577

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Poverty gap baseline model

2005

Ramsey RESET test using powers of the fitted values of p1_expadeq14

Ho: model has no omitted variables

$$F(3, 8887) = 200.64$$

$$\text{Prob} > F = 0$$

Variable	VIF	1/VIF
-----+-----		
nworker18	2.48	0.403
hhsize	2.31	0.433
age	1.42	0.706
lninc	1.37	0.731
married	1.25	0.800
lnsaving	1.25	0.800
enrollment~s	1.24	0.808
femalehead	1.19	0.841
forrem	1.13	0.888
region	1.12	0.889
province	1.07	0.932
-----+-----		
Mean VIF	1.44	

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Squared poverty gap baseline model

2005

Ramsey RESET test using powers of the fitted values of p2_expadeq14

Ho: model has no omitted variables

$$F(3, 8887) = 203.39$$

$$\text{Prob} > F = 0$$

Poverty headcount alternative model

2005

Probit model for p0_e14

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	3982	1312	5294
-	1254	3997	5251
-----+-----+-----			
Total	5236	5309	10545

Classified + if predicted $\text{Pr}(D) \geq .5$

True D defined as p0_e14 != 0

Sensitivity	Pr(+ D)	76.05%
Specificity	Pr(- ~D)	75.29%
Positive predictive value	Pr(D +)	75.22%
Negative predictive value	Pr(~D -)	76.12%

False + rate for true ~D	Pr(+ ~D)	24.71%
False - rate for true D	Pr(- D)	23.95%
False + rate for classified +	Pr(~D +)	24.78%
False - rate for classified -	Pr(D -)	23.88%

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Correctly classified	75.67%
----------------------	--------

Probit model for p0_e14, goodness-of-fit test

number of observations =	10545
number of covariate patterns =	10464
Pearson chi2(10452) =	250849.53
Prob > chi2 =	0

Model		Obs	ll(null)	ll(model)	df	AIC	BIC
<hr/>							
.		10545	-7308.984	-5342.94	12	10709.88	10797.04

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Poverty gap alternative model
2005

Ramsey RESET test using powers of the fitted values of p1_expadeq14

Ho: model has no omitted variables

$F(3, 10530) = 190.89$

Prob > F = 0

Variable	VIF	1/VIF
-----+-----		
nworker18	2.30	0.435
hhsize	2.17	0.461
age	1.37	0.728
lninc	1.27	0.786
married	1.26	0.796
enrollment~s	1.19	0.842
femalehead	1.18	0.849
region	1.11	0.901
forrem	1.07	0.937
province	1.04	0.957
agri_land	1.04	0.961
-----+-----		
Mean VIF	1.36	

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Squared poverty gap alternative model

2005

Ramsey RESET test using powers of the fitted values of p2_expadeq14

Ho: model has no omitted variables

$F(3, 10530) = 194.91$

Prob > F = 0

Poverty headcount baseline model

2007

Probit model for p0_e14

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	507	173	680
-	332	1832	2164
-----+-----+-----			
Total	839	2005	2844

Classified + if predicted $\Pr(D) \geq .5$

True D defined as p0_e14 != 0

Sensitivity	$\Pr(+ D)$	60.43%
Specificity	$\Pr(- \sim D)$	91.37%
Positive predictive value	$\Pr(D +)$	74.56%
Negative predictive value	$\Pr(\sim D -)$	84.66%

False + rate for true ~D	$\Pr(+ \sim D)$	8.63%
False - rate for true D	$\Pr(- D)$	39.57%
False + rate for classified +	$\Pr(\sim D +)$	25.44%
False - rate for classified -	$\Pr(D -)$	15.34%

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and microeconomic evidence

Correctly classified 82.24%

Probit model for p0_e14, goodness-of-fit test

number of observations = 2844
number of covariate patterns = 2792
Pearson chi2(2780) = 2492.33
Prob > chi2 = 1.000

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	2844	-1725.097	-1116.343	12	2256.687	2328.122

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence
Poverty gap baseline model
2007

Ramsey RESET test using powers of the fitted values of p1_expadeq14

Ho: model has no omitted variables

$$F(3, 2829) = 107.70$$

$$\text{Prob} > F = 0$$

Variable	VIF	1/VIF
-----+-----		
hhszsize	2.88	0.346
nworker18	2.88	0.347
lninc	1.29	0.772
enrollment~s	1.26	0.793
forrem	1.18	0.844
lnsaving	1.18	0.846
age	1.18	0.849
married	1.17	0.854
province	1.13	0.881
region	1.11	0.897
femalehead	1.08	0.928
-----+-----		
Mean VIF	1.49	

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Squared poverty gap baseline model

2007

Ramsey RESET test using powers of the fitted values of p2_expadeq14

Ho: model has no omitted variables

$$F(3, 2829) = 105.13$$

$$\text{Prob} > F = 0$$

Poverty headcount alternative model

2007

Probit model for p0_e14

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	66	24	90
-	61	365	426
-----+-----+-----			
Total	127	389	516

Classified + if predicted $\text{Pr}(D) \geq .5$

True D defined as p0_e14 != 0

Sensitivity	$\text{Pr}(+ D)$	51.97%
Specificity	$\text{Pr}(- \sim D)$	93.83%
Positive predictive value	$\text{Pr}(D +)$	73.33%
Negative predictive value	$\text{Pr}(\sim D -)$	85.68%

False + rate for true ~D	$\text{Pr}(+ \sim D)$	6.17%
False - rate for true D	$\text{Pr}(- D)$	48.03%
False + rate for classified +	$\text{Pr}(\sim D +)$	26.67%
False - rate for classified -	$\text{Pr}(D -)$	14.32%

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Correctly classified 83.53%

Probit model for p0_e14, goodness-of-fit test

number of observations = 516
number of covariate patterns = 516
Pearson chi2(505) = 578.01
Prob > chi2 = 0.013

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	516	-287.947	-198.474	11	418.949	465.656

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Poverty gap alternative model

2007

Ramsey RESET test using powers of the fitted values of p1_expadeq14

Ho: model has no omitted variables

$$F(3, 508) = 18.14$$

$$\text{Prob} > F = 0$$

Variable	VIF	1/VIF
-----+-----		
hhszsize	2.55	0.392
nworker18	2.54	0.394
lninc	1.49	0.671
forrem	1.32	0.760
age	1.21	0.825
married	1.21	0.829
femalehead	1.19	0.839
enrollment~s	1.18	0.844
region	1.15	0.867
province	1.10	0.908
agrilandow~p	1.06	0.942
-----+-----		
Mean VIF	1.45	

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

First quintile

2005

Probit model for q_e1

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	785	338	1123
-	844	6935	7779
-----+-----+-----			
Total	1629	7273	8902

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e1 != 0

Sensitivity	$\Pr(+ D)$	48.19%
Specificity	$\Pr(- \sim D)$	95.35%
Positive predictive value	$\Pr(D +)$	69.90%
Negative predictive value	$\Pr(\sim D -)$	89.15%

False + rate for true ~D	$\Pr(+ \sim D)$	4.65%
False - rate for true D	$\Pr(- D)$	51.81%
False + rate for classified +	$\Pr(\sim D +)$	30.10%
False - rate for classified -	$\Pr(D -)$	10.85%

Correctly classified	86.72%
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Probit model for q_e1, goodness-of-fit test

number of observations = 8902
number of covariate patterns = 8899

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Pearson chi2(8887) = 10621.30
Prob > chi2 = 0

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	8902	-4236.471	-2689.429	12	5402.858	5487.986

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Second quintile

2005

Probit model for q_e2

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	11	45	56
-	1672	7174	8846
-----+-----+-----			
Total	1683	7219	8902

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e2 != 0

Sensitivity	$\Pr(+ D)$	0.65%
Specificity	$\Pr(- \sim D)$	99.38%
Positive predictive value	$\Pr(D +)$	19.64%
Negative predictive value	$\Pr(\sim D -)$	81.10%

False + rate for true ~D	$\Pr(+ \sim D)$	0.62%
False - rate for true D	$\Pr(- D)$	99.35%
False + rate for classified +	$\Pr(\sim D +)$	80.36%
False - rate for classified -	$\Pr(D -)$	18.90%

Correctly classified 80.71%

Probit model for q_e2, goodness-of-fit test

number of observations =	8902
number of covariate patterns =	8899
Pearson chi2(8887) =	8114.97
Prob > chi2 =	1.000

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Model		Obs	ll(null)	ll(model)	df	AIC BIC
-----+-----						
.		8902	-4316.18	-3956.149	12	7936.298 8021.427

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Third quintile

2005

Probit model for q_e3

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	0	0	0
-	1800	7102	8902
-----+-----+-----			
Total	1800	7102	8902

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e3 != 0

Sensitivity	$\Pr(+ D)$	0.00%
Specificity	$\Pr(- \sim D)$	100.00%
Positive predictive value	$\Pr(D +)$	
Negative predictive value	$\Pr(\sim D -)$	79.78%

False + rate for true ~D	$\Pr(+ \sim D)$	0.00%
False - rate for true D	$\Pr(- D)$	100.00%
False + rate for classified +	$\Pr(\sim D +)$	
False - rate for classified -	$\Pr(D -)$	20.22%

Correctly classified	79.78%
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Probit model for q_e3, goodness-of-fit test

number of observations =	8902
number of covariate patterns =	8899

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Pearson chi2(8887) = 8883.13
Prob > chi2 = 0.509

Model		Obs	ll(null)	ll(model)	df	AIC BIC
-----+-----						
.		8902	-4481.619	-4448.695	12	8921.39 9006.518

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Fourth quintile

2005

Probit model for q_e4

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	7	63	70
-	1841	6991	8832
-----+-----+-----			
Total	1848	7054	8902

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e4 != 0

Sensitivity	$\Pr(+ D)$	0.38%
Specificity	$\Pr(- \sim D)$	99.11%
Positive predictive value	$\Pr(D +)$	10.00%
Negative predictive value	$\Pr(\sim D -)$	79.16%

False + rate for true ~D	$\Pr(+ \sim D)$	0.89%
False - rate for true D	$\Pr(- D)$	99.62%
False + rate for classified +	$\Pr(\sim D +)$	90.00%
False - rate for classified -	$\Pr(D -)$	20.84%

Correctly classified	78.61%
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Probit model for q_e4, goodness-of-fit test

number of observations =	8902
number of covariate patterns =	8899

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Pearson chi2(8887) = 8574.15
Prob > chi2 = 0.9911

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	8902	-4546.707	-4346.641	12	8717.282	8802.41

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Fifth quintile

2005

Probit model for q_e5

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	1046	355	1401
-	896	6605	7501
-----+-----+-----			
Total	1942	6960	8902

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e5 != 0

Sensitivity	$\Pr(+ D)$	53.86%
Specificity	$\Pr(- \sim D)$	94.90%
Positive predictive value	$\Pr(D +)$	74.66%
Negative predictive value	$\Pr(\sim D -)$	88.05%

False + rate for true ~D	$\Pr(+ \sim D)$	5.10%
False - rate for true D	$\Pr(- D)$	46.14%
False + rate for classified +	$\Pr(\sim D +)$	25.34%
False - rate for classified -	$\Pr(D -)$	11.95%

Correctly classified 85.95%

Probit model for q_e5, goodness-of-fit test

number of observations = 8902
number of covariate patterns = 8899

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Pearson chi2(8887) = 176553.91

Prob > chi2 = 0

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	8902	-4669.638	-2915.234	12	5854.468	5939.597

Propensity score test:

2005

Variable	Sample	Mean	%reduct	t-test	%bias	bias	t	p> t
hhsizes	Unmatched	8.673	7.229	36.1			11.58	0.000
	Matched	8.808	8.7505	1.5	96.0	0.20	0.839	
femalehead	Unmatched	.098	.0182	34.8			15.64	0.000
	Matched	.066	.0680	-0.7	98.1	-0.10	0.917	
lninc	Unmatched	9.377	11.067	-56.1			-25.62	0.000
	Matched	9.464	9.868	-13.4	76.1	-1.70	0.089	
lnsaving	Unmatched	10.727	9.888	65.7			16.13	0.000
	Matched	10.733	10.689	3.5	94.7	0.56	0.575	
enrollment~s	Unmatched	.688	.568	24.9			6.96	0.000
	Matched	.699	.692	1.4	94.3	0.25	0.799	
region	Unmatched	.371	.406	-7.1			-2.04	0.041
	Matched	.363	.375	-2.4	65.9	-0.42	0.674	

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microeconomic evidence

province	Unmatched	2.086	2.020	6.2		1.77	0.077
	Matched	2.073	2.071	0.2	96.8		0.03 0.973

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

First quintile

2007

Probit model for q_e1

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	134	69	203
-	213	2428	2641
-----+-----+-----			
Total	347	2497	2844

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e1 != 0

Sensitivity	$\Pr(+ D)$	38.62%
Specificity	$\Pr(- \sim D)$	97.24%
Positive predictive value	$\Pr(D +)$	66.01%
Negative predictive value	$\Pr(\sim D -)$	91.93%

False + rate for true ~D	$\Pr(+ \sim D)$	2.76%
False - rate for true D	$\Pr(- D)$	61.38%
False + rate for classified +	$\Pr(\sim D +)$	33.99%
False - rate for classified -	$\Pr(D -)$	8.07%

Correctly classified 90.08%

Probit model for q_e1, goodness-of-fit test

number of observations = 2844
number of covariate patterns = 2792
Pearson $\chi^2(2780) = 2323.04$

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Prob > chi2 = 1.000

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	2844	-1054.877	-662.817	12	1349.634	1421.07

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Second quintile

2007

Probit model for q_e2

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	0	8	8
-	401	2435	2836
-----+-----+-----			
Total	401	2443	2844

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e2 != 0

Sensitivity	$\Pr(+ D)$	0.00%
Specificity	$\Pr(- \sim D)$	99.67%
Positive predictive value	$\Pr(D +)$	0.00%
Negative predictive value	$\Pr(\sim D -)$	85.86%

False + rate for true ~D	$\Pr(+ \sim D)$	0.33%
False - rate for true D	$\Pr(- D)$	100.00%
False + rate for classified +	$\Pr(\sim D +)$	100.00%
False - rate for classified -	$\Pr(D -)$	14.14%

Correctly classified		85.62%

Probit model for q_e2, goodness-of-fit test

number of observations = 2844
number of covariate patterns = 2792

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microeconomic evidence

Pearson chi2(2780) = 2482.21
Prob > chi2 = 1.000

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	2844	-1156.86	-1029.704	12	2083.407	2154.843

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Third quintile

2007

Probit model for q_e3

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	0	0	0
-	564	2280	2844
-----+-----+-----			
Total	564	2280	2844

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e3 != 0

Sensitivity	$\Pr(+ D)$	0.00%
Specificity	$\Pr(- \sim D)$	100.00%
Positive predictive value	$\Pr(D +)$	
Negative predictive value	$\Pr(\sim D -)$	80.17%

False + rate for true ~D	$\Pr(+ \sim D)$	0.00%
False - rate for true D	$\Pr(- D)$	100.00%
False + rate for classified +	$\Pr(\sim D +)$	
False - rate for classified -	$\Pr(D -)$	19.83%

Correctly classified		80.17%

Probit model for q_e3, goodness-of-fit test

number of observations = 2844
number of covariate patterns = 2792

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microeconomic evidence

Pearson chi2(2780) = 2809.95
Prob > chi2 = 0.341

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	2844	-1416.465	-1381.402	12	2786.805	2858.24

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Fourth quintile

2007

Probit model for q_e4

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	0	0	0
-	707	2137	2844
-----+-----+-----			
Total	707	2137	2844

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e4 != 0

Sensitivity	$\Pr(+ D)$	0.00%
Specificity	$\Pr(- \sim D)$	100.00%
Positive predictive value	$\Pr(D +)$	
Negative predictive value	$\Pr(\sim D -)$	75.14%

False + rate for true ~D	$\Pr(+ \sim D)$	0.00%
False - rate for true D	$\Pr(- D)$	100.00%
False + rate for classified +	$\Pr(\sim D +)$	
False - rate for classified -	$\Pr(D -)$	24.86%

Correctly classified	75.14%
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Probit model for q_e4, goodness-of-fit test

number of observations =	2844
number of covariate patterns =	2792

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microeconomic evidence

Pearson chi2(2780) = 2825.56
Prob > chi2 = 0.268

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	2844	-1594.872	-1570.375	12	3164.75	3236.186

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microeconomic evidence

Fifth quintile

2007

Probit model for q_e5

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	452	195	647
-	373	1824	2197
-----+-----+-----			
Total	825	2019	2844

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e5 != 0

Sensitivity	$\Pr(+ D)$	54.79%
Specificity	$\Pr(- \sim D)$	90.34%
Positive predictive value	$\Pr(D +)$	69.86%
Negative predictive value	$\Pr(\sim D -)$	83.02%

False + rate for true ~D	$\Pr(+ \sim D)$	9.66%
False - rate for true D	$\Pr(- D)$	45.21%
False + rate for classified +	$\Pr(\sim D +)$	30.14%
False - rate for classified -	$\Pr(D -)$	16.98%

Correctly classified	80.03%
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Probit model for q_e5, goodness-of-fit test

number of observations =	2844
number of covariate patterns =	2792

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microeconomic evidence

Pearson chi2(2780) = 4460.72

Prob > chi2 = 0

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	2844	-1712.734	-1173.469	12	2370.937	2442.373

Propensity score test:

2007

Variable	Sample	Mean	%reduct	%bias	t	p> t
hhsizes	Unmatched	8.863	8.535	8.6	1.45	0.148
	Matched	8.991	8.5291	12.1	-40.9	1.36 0.174
femalehead	Unmatched	.0427	.002	27.1	11.14	0.000
	Matched	.0291	.0006	19.3	28.6	2.60 0.010
lninc	Unmatched	8.564	11.667	-82.4	-37.82	0.000
	Matched	9.227	9.2946	-1.8	97.8	-0.15 0.882
linsaving	Unmatched	11.167	10.494	61.2	9.36	0.000
	Matched	11.262	11.059	18.5	69.8	2.00 0.046
enrollment~s	Unmatched	.621	.609	2.6	0.44	0.662
	Matched	.575	.617	-8.7	-230.7	-0.94 0.346
region	Unmatched	.359	.459	-20.5	-3.54	0.000
	Matched	.416	.3988	3.6	82.2	0.40 0.691

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microeconomic evidence

province	Unmatched	2.024	2.171	-13.1		-2.28	0.023
	Matched	2.079	2.162	-7.4	43.5	-0.80	0.424

Internal remittances

Poverty headcount baseline model

Probit model for p0_e14

----- True -----			
Classified		D ~D	Total
-----+-----+-----			
+		499 178	677
-		402 2100	2502
-----+-----+-----			
Total		901 2278	3179

Classified + if predicted $\Pr(D) \geq .5$

True D defined as p0_e14 != 0

Sensitivity	Pr(+ D)	55.38%
Specificity	Pr(- ~D)	92.19%
Positive predictive value	Pr(D +)	73.71%
Negative predictive value	Pr(~D -)	83.93%

False + rate for true ~D	Pr(+ ~D)	7.81%
False - rate for true D	Pr(- D)	44.62%
False + rate for classified +	Pr(~D +)	26.29%
False - rate for classified -	Pr(D -)	16.07%

Correctly classified	81.76%
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microeconomic evidence

Probit model for p0_e14, goodness-of-fit test

number of observations = 3179
number of covariate patterns = 3111
Pearson chi2(3099) = 3618.40
Prob > chi2 = 0

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	3179	-1895.182	-1316.111	12	2656.222	2728.994

Poverty gap baseline model

Ramsey RESET test using powers of the fitted values of p1_expadeq14

Ho: model has no omitted variables

F(3, 3164) = 132.17
Prob > F = 0

Variable	VIF	1/VIF
Hhsize	3.03	0.330
nworker18	3.00	0.332
lninc	1.32	0.756
enrollment~s	1.27	0.788
femalehead	1.19	0.842
age	1.18	0.850
married	1.17	0.855
lnsaving	1.15	0.867
province	1.14	0.877
region	1.13	0.884
intrem	1.13	0.887

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microeconomic evidence

Mean VIF | 1.52

Ramsey RESET test using powers of the fitted values of p2_expadeq14

Ho: model has no omitted variables

$F(3, 3164) = 105.06$

Prob > F = 0

First quintile

Probit model for q_e1

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	138	66	204
-	235	2740	2975
-----+-----+-----			
Total	373	2806	3179

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e1 != 0

Sensitivity	$\Pr(+ D)$	37.00%
Specificity	$\Pr(- \sim D)$	97.65%
Positive predictive value	$\Pr(D +)$	67.65%
Negative predictive value	$\Pr(\sim D -)$	92.10%

False + rate for true ~D	$\Pr(+ \sim D)$	2.35%
False - rate for true D	$\Pr(- D)$	63.00%
False + rate for classified +	$\Pr(\sim D +)$	32.35%
False - rate for classified -	$\Pr(D -)$	7.90%

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microeconomic evidence

Correctly classified 90.53%

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence

Probit model for q_e1, goodness-of-fit test

number of observations = 3179
number of covariate patterns = 3111
Pearson chi2(3099) = 2441.51
Prob > chi2 = 1.000

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	3179	-1149.451	-721.792	12	1467.585	1540.357

Chapter 4: Remittances, inequality and poverty in Pakistan: macro and
microeconomic evidence
Second quintile

Probit model for q_e2

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	3	17	20
-	465	2694	3159
-----+-----+-----			
Total	468	2711	3179

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e2 != 0

Sensitivity	$\Pr(+ D)$	0.64%
Specificity	$\Pr(- \sim D)$	99.37%
Positive predictive value	$\Pr(D +)$	15.00%
Negative predictive value	$\Pr(\sim D -)$	85.28%

False + rate for true ~D	$\Pr(+ \sim D)$	0.63%
False - rate for true D	$\Pr(- D)$	99.36%
False + rate for classified +	$\Pr(\sim D +)$	85.00%
False - rate for classified -	$\Pr(D -)$	14.72%

Correctly classified	84.84%
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Probit model for q_e2, goodness-of-fit test

number of observations = 3179
number of covariate patterns = 3111
Pearson chi2(3099) = 2765.35
Prob > chi2 = 1.000

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	3179	-1328.344	-1176.746	12	2377.492	2450.264

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Third quintile

Probit model for q_e3

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	0	0	0
-	612	2567	3179
-----+-----+-----			
Total	612	2567	3179

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e3 != 0

Sensitivity	$\Pr(+ D)$	0.00%
Specificity	$\Pr(- \sim D)$	100.00%
Positive predictive value	$\Pr(D +)$	
Negative predictive value	$\Pr(\sim D -)$	80.75%

False + rate for true ~D	$\Pr(+ \sim D)$	0.00%
False - rate for true D	$\Pr(- D)$	100.00%
False + rate for classified +	$\Pr(\sim D +)$	
False - rate for classified -	$\Pr(D -)$	19.25%

Correctly classified 80.75%

Probit model for q_e3, goodness-of-fit test

number of observations = 3179
number of covariate patterns = 3111
Pearson $\chi^2(3099) = 3136.02$

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Prob > chi2 = 0.316

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	3179	-1557.223	-1528.439	12	3080.879	3153.651

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Fourth quintile

Probit model for q_e4

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	0	0	0
-	792	2387	3179
-----+-----+-----			
Total	792	2387	3179

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e4 != 0

Sensitivity	$\Pr(+ D)$	0.00%
Specificity	$\Pr(- \sim D)$	100.00%
Positive predictive value	$\Pr(D +)$	
Negative predictive value	$\Pr(\sim D -)$	75.09%

False + rate for true ~D	$\Pr(+ \sim D)$	0.00%
False - rate for true D	$\Pr(- D)$	100.00%
False + rate for classified +	$\Pr(\sim D +)$	
False - rate for classified -	$\Pr(D -)$	24.91%

Correctly classified	75.09%
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Probit model for q_e4, goodness-of-fit test

number of observations =	3179
number of covariate patterns =	3111

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Pearson chi2(3099) = 3163.30
Prob > chi2 = 0.206

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	3179	-1784.636	-1757.37	12	3538.74	3611.512

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Fifth quintile

Probit model for q_e5

----- True -----			
Classified	D	~D	Total
-----+-----+-----			
+	484	203	687
-	450	2042	2492
-----+-----+-----			
Total	934	2245	3179

Classified + if predicted $\Pr(D) \geq .5$

True D defined as q_e5 != 0

Sensitivity	$\Pr(+ D)$	51.82%
Specificity	$\Pr(- \sim D)$	90.96%
Positive predictive value	$\Pr(D +)$	70.45%
Negative predictive value	$\Pr(\sim D -)$	81.94%

False + rate for true ~D	$\Pr(+ \sim D)$	9.04%
False - rate for true D	$\Pr(- D)$	48.18%
False + rate for classified +	$\Pr(\sim D +)$	29.55%
False - rate for classified -	$\Pr(D -)$	18.06%

Correctly classified 79.46%

Probit model for q_e5, goodness-of-fit test

number of observations = 3179
number of covariate patterns = 3111
Pearson $\chi^2(3099) = 4298.90$

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Prob > chi2 = 0

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
-----+-----						
.	3179	-1924.954	-1362.6	12	2749.2	2821.972

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B2. Tests for macroeconomic models

Aggregate model

--

Underidentification test (Kleibergen-Paap rk LM statistic):	9.224
Chi-sq(1) P-val =	0.002

Weak identification test (Cragg-Donald Wald F statistic):	36.126
(Kleibergen-Paap rk Wald F statistic):	24.882

--

Hansen J statistic (overidentification test of all instruments):	0.000
(equation exactly identified)	

Region-wise model

--

Underidentification test (Kleibergen-Paap rk LM statistic):	3.461
Chi-sq(1) P-val =	0.0628

Weak identification test (Cragg-Donald Wald F statistic):	3.147
(Kleibergen-Paap rk Wald F statistic):	11.159

Hansen J statistic (overidentification test of all instruments):	0.000
(equation exactly identified)	

CHAPTER 5: REMITTANCES AS DEVELOPMENT STRATEGY

The empirical analysis presented in the previous chapters has thrown light on the characteristics and behaviour of remittance flows to Pakistan. In this final chapter, we will draw conclusions, suggest the way forward, and discuss possible extensions to our work. But first, let us briefly take stock of our main findings.

5.1 WHAT HAVE WE LEARNT SO FAR?⁴⁷

In chapter 2, we analyzed the monthly volatility of remittances flows for the period from July 1972 to December 2011 using ARCH/GARCH methods. We found that remittances have been a relatively stable flow of foreign exchange for Pakistan in the last four decades (showing a moderate ARCH coefficient of 0.23). Their volatility has nevertheless increased since 2001 (ARCH coefficient reaching 0.30), and has indeed surpassed that of the FDI (ARCH coefficient being 0.22). Remittance flows from Gulf and North America are more volatile than those from Europe. North American remittances manifest a pro-cyclical behaviour, being strongly correlated with home and host output (see also Mughal and Makhoul, 2011a). This pro-cyclical behaviour of remittances is also evident in the study of their macroeconomic determinants using time series and panel data techniques. Remittances to Pakistan, therefore, seem to have a deepening effect on the country's business cycles, instead of a smoothening one. Output fluctuations get accentuated, and crises are intensified. This behaviour has varied in the past, depending on the regional composition of remittances and the economic and socio-political situation of the migrant-hosting countries. The pro-cyclical nature of remittances gives an indication that the Pakistani migrants have, over the years, tended to take advantage of the investment opportunities available during the boom years, while decreasing money transfer during difficult times.

⁴⁷ A version of this chapter is published in the Journal of International Development as "Remittances as development strategy: Stepping stones or slippery slope?". A preliminary version of this chapter was presented under the same title at the 20th CEDIMES conference, Development Models of Emerging Countries: Characteristics, Scope and Challenges, November 8-10, 2010, University Laval, Québec, Canada

This may however not be the only, or indeed the most pernicious, side-effect of remittances. Another negative effect pertains to the so-called Dutch disease. In Chapter 3, employing Bayesian analytical methods, we examined Pakistan's international competitiveness using annual (1980 – 2008) as well as monthly data (2000 to 2009). We found that the Pakistani economy exhibited symptoms of Dutch disease as a result of the remittance inflows. The real exchange rate has risen and the services sector has expanded (also see Mughal and Makhoulf, 2011b). A doubling of foreign remittances as a share of the GDP appears to be associated with 29 % rise in the country's real exchange rate and between one and 6% fall in the tradable to non-tradable ratio. These impacts are stronger and different from those the Official Development Assistance and the FDI exert. We find that while aggregate remittances and the remittances from the Persian Gulf contribute to the Dutch disease in Pakistan, those from North America and Europe do not. This differential impact may be due to the highly procyclical nature of remittances from the Gulf suggested in Chapter 2.

Unlike the negative impact on competitiveness, remittance flows are found to have impacted the country's growth positively over all (Mughal and Makhoulf, 2010). This impact implies that in the past, the favourable effects of remittances on the country's growth have outweighed negative ones such as the Dutch disease effects.

We find evidence of poverty-alleviating and inequality-lowering impacts of remittances. Our microeconomic study using Household Integrated Economic Surveys on 15,000 households for 2005-06 and 2007-08 showed that foreign remittances appeared to substantially lower poverty headcount, as well as the depth and severity of poverty. They also have a benign effect on consumption inequality in Pakistan. The contribution of foreign remittances in poverty alleviation and inequality reduction is much stronger than that of internal remittances. We also examined region-wise remittance flows using 2SLS time series technique for the period from 1979 to 2007. We found that among the three main remittance-sending regions, remittances from North America had the strongest equalizing effect in Pakistan. This positive impact of foreign remittances on poverty and inequality can be understood in the light of the migrants' motives behind remitting. From our household survey-based analysis, we gather that altruism seems to be the overarching motive behind these

remittances, beside co-insurance and investment (Chapter 2, Anwar and Mughal 2012). A 10 % higher household income *ceteris paribus* decreases the likelihood of receiving remittances by 1.4 to 1.5 %.

We also studied the labour participation effects of remittances applying Probit and Propensity Score Matching techniques, and found that foreign and domestic remittances both tend to lower labour supply of the recipient households. This impact is higher among women and among the young. The impact is more pronounced in rural areas. Besides, foreign remittances increase the likelihood of the household members attending the middle school. Furthermore, the likelihood of being self-employed and being own-cultivator is higher among remittance recipients.

These results raise some critical questions: Can remittances be leveraged as a tool for Pakistan's development? Will the effects of this strategy be beneficial for the economy, or will the inconveniences outweigh its advantages? Will it be judicious, or even feasible, for a developing country to grow and rise above poverty using financial flows meant directly for some of its households? Can this policy be sustainable? Can a country cope with the monetary and social challenges arising from such sustained flows?

In the light of our findings, we will examine these questions, and suggest some possible solutions in the following. In the next section, we will briefly look at the challenges remittance flows pose to the Pakistani economy.

5.2 PROSPECTS AND CHALLENGES

5.2.1 Instability and pro-cyclicality

Although they seem to reduce poverty and provide financing for investments in Pakistan, remittances pose some serious challenges to the country's economy. One is their potential volatility. Remittances to Pakistan in the last four decades have been much more stable than foreign investments, effect reflected in their respective coefficients of variation: 0.85 vs 1.79 (section 2.2). Their stable nature is similar to that of the official development assistance, though without any strings attached (Mughal and Makhoulf, 2011a). However, Gulf and North America (the two major

remittance-sending regions) have shown high volatility, particularly in the post September 2001 era. In the case of the former, it may be mainly due to the sharp swings in the price of crude oil in the last three decades, while the latter may be due to the age and changing profile of the Pakistani Diaspora. Pakistani migrants to North America can be grouped into two distinct categories: the first consisting of professionals who came to the USA and Canada in the 1960s, and the other comprising the later arrivals. The first group is by now mostly settled in and financially interacts with the home country often via investment and philanthropic endeavours (Najam 2006). The more recent group, on the other hand, still maintains kinship ties and hence also remits to the immediate family back home. This different behaviour of the two groups (investment-related versus altruistic and pro-cyclical Vs countercyclical) may cause the money transfer from the region to fluctuate in seemingly irregular patterns. The increasing share of North American remittances in the overall inflows may therefore imply recurring volatility in the short run. Another aspect of the remittance flows from North America is their high correlation, both with their national as well as Pakistan's GDP. This points to the overall investor profile of the North American Pakistani Diaspora, which may not be very helpful for the country during difficult times. The potential volatility of remittances from these two regions is enough to pose a developing economy like Pakistan some difficulties.

Another aspect is the way in which local economy gets closely linked with the migrant-receiving ones. Lower remittance flows from any major migrant destination in recession can plunge the migrant-sending economy into an economic crisis of its own. The strong covariance between remittances, especially those from North America, and the host economy output can be a source of instability. Remittances can act as yet another channel through which financial and economic crises propagate in today's globalized economy (Ruiz and Vargas-Silva 2010). This was seen in the case of a number of Latin American and Caribbean (LAC) countries during the recent economic crisis in the USA. After a sharp increase in formal remittance flows to the LAC countries during the years of great moderation, remittance growth stalled and in many cases turned negative during 2008-09, adding to the economic difficulties of the

developing countries already facing slowing export growth. Remittances, in such a situation, may stop precisely when the country may need them the most⁴⁸.

For Pakistan, the three remittance-sending regions (Gulf, North America, Europe) are the same with which the bulk of the country's trade takes place. However, the country's economy may be spared the predicament that some LAC countries faced. Pakistan's migrant community, as discussed in the previous chapters, is diverse and heterogeneous. Given that the three regions differ substantially in their economic structures, boom and bust cycles of the three are not identical. This implies low overall volatility, even though a slowdown in remittance activity during a worldwide recession cannot be ruled out.

5.2.2 Competitiveness

Loss of export competitiveness and rise of the services sector at the cost of industry and agriculture is another challenge for the policymakers. For a country whose forte has long been its agriculture and agriculture-related industrial products, productivity and competitiveness of the tradable sector is critical for the economy's health. Pakistan's exports of textiles and apparels, leather items and light machinery already face tough competition in the international market, in the presence of small profit margins and low value-addition. Poor infrastructure and weak law and order situation are hampering the export industry's growth. A remittance-induced further decline in competitiveness may go against the country's requirement of new and more jobs for an ever-rising population.

Remittances have also contributed to demand-push inflation in the last decade, and in spite of the State Bank carrying out occasional excess liquidity mopping operations, the rates of inflation and money supply have remained uncomfortably high. This has been an additional source of worry for the local industry.

⁴⁸ See Kapur(2004:24), Korovilas(1998) etc for examples of other countries suffering from host-country crises through remittances.

5.2.3 Domestic production and trade deficit

Migrant remittances also bring new lifestyles and a taste for foreign goods (social remittances). Along with remittances in kind, migrant households tend to consume more imported goods. This trend propagates in the society through consumption envy, and has the consequence of decreasing the potential multiplier effect of the money and mounting import demand and inflation (Russell, 1986). Pakistan has faced chronic trade deficits throughout its history. Increased reliance on remittances may in future entail even higher trade deficits.

5.2.4 Inequality

As shown in the previous chapter, in the past remittances are shown to have reduced economic disparity, both on the national as well as community level. This may, however, not continue in future. In earlier decades, an average Pakistani migrant was semi or unskilled, coming typically from a poor, rural background. This implied that remittance inflows went hand in hand with poverty alleviation and inequality reduction. This is no more the case now, as migration from Pakistan is increasing in skill intensity (Cock and Sun 2011). This trend is bound to stay, as more and more labour-receiving countries are promoting skilled immigration. For instance, one of Pakistan's important labour export markets, the United Kingdom has brought several reforms to her migration policies in the last few years, introducing a points-based migrant assessment and relying more on European labour. This has dented the prospects of sustained labour export from Pakistan. Similarly, access to the U.S. and other major labour markets is increasingly getting restricted, especially for less skilled migrants. Mass outflows of Pakistani semi and unskilled workers to serve as construction workers, drivers and factory workers, as happened in the 1970s and 1980s, are no more likely. As a result, current remittances are increasingly going to more educated, middle-income households. Remittances, therefore, may well begin adding to the already substantial income gap between the urban and the rural areas (an average rural area resident in Pakistan earns 50 percent less than an average city-dweller). Besides, according to the 2007 Pakistan Social and Living-standards measurement survey (PSLM), only 4.6 percent households

receive foreign remittances. Given that skilled migrants earn more, and on average, remit more, income inequality may go up even on the community level. Those without the capability to migrate (in the sense of Sen 1992) may be left further behind, and deprived of the opportunities they need the most. Remittances may thus reinforce existing inequities (Gabel 2008).

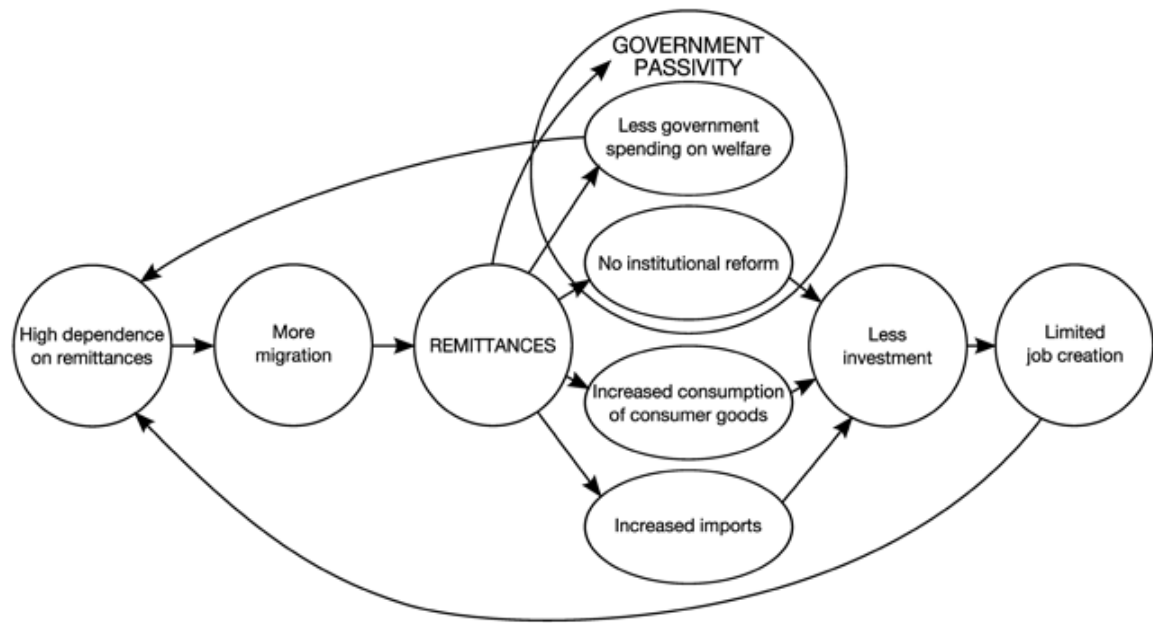
In addition, most of the Pakistani migrants have traditionally come from a few districts in Punjab, Khyber Pakhtunkhwa (KPK) and Karachi. Sustained remittance flows have meant higher living standards for these districts, leaving the rest of the country behind. This may add to the existing regional economic disparities in the country.

5.2.5 Dependency mind-set

Another issue in the long run, and perhaps a more serious one, is the dependency mindset that remittances could foster. Once remittances inflows grow sufficiently large as a share of the GDP, and a large proportion of the population gets used to income from abroad, remittances may become more of a liability. The country's human capital may no more match the demands of the local economy, and the export sector may become limited, providing few job opportunities, subsequently causing an even greater motivation for emigration. As Pakistan's rising remittances have now crossed 5 percent of the GDP, an additional government impetus to increase remittances may end up making the country more dependent on financial flows from abroad. Remittances today cover a big chunk of Pakistan's foreign exchange requirements, and rising remittances are bound to worsen this dependency.

The dependency mindset may also hinder the growth of productive investment opportunities, and may limit the creation of jobs that infusion of capital can otherwise inject in a developing economy. Though the receipt of money from the member living abroad improves the migrant household's living standards, it creates a greater urge among the non-remittance-receiving households, ultimately causing further migration. A sustained rise in migration and remittances has therefore the potential to develop into a vicious dependency cycle (figure 1), where the migrants, non-migrants and the government all end up depending on foreign remittances, and any sudden stop to these flows may cause severe hardship at home.

Figure 5.1. Remittance dependency cycle



Source: Vogiazides (2008)

Here, it will be instructive to examine other developing countries which have relied heavily on migration and remittances for development. Among the major remittance-receiving countries, Philippines have probably the best established immigration program, with one fourth of the labour force serving abroad (Bayangos and Jansen 2010). Remittances sent by Filipino migrants constitute 10 percent of the GDP. These remittances have lowered poverty, raised child schooling and promoted entrepreneurial activity (Yang 2008). However, they have been volatile in times of crises (Ratha 2003), and have kept the agricultural sector from modernizing (Hugo 2003). Unlike other South East Asian success stories like Malaysia, Indonesia, Singapore and Thailand, the Philippines have not actively sought foreign investment, relying more on labour exports. As a result, growth has remained sluggish and the economy cannot compete with its more productive neighbours. The Asian growth miracle has consequently bypassed the Philippines.

5.2.6 Government complacency

Yet another potential challenge arising from sustained remittance flows is what Grabel (2008) terms as “Public moral hazard”. Government of a developing country may be tempted to ignore its responsibilities and withdraw from the provision of public services, knowing that migrant households can manage to live without them. For instance, remittance-receiving households in Pakistan often prefer paying for better quality private health and education services, obviating the need for their public provision. In the last three decades, the number of private educational institutions in the country has multiplied while enrolment in public sector institutions has dropped (Andrabi et al. 2008). Such a reduction in the government’s role ultimately makes the population more reliant on remittances, and can turn into a vicious cycle in which government’s withdrawal from its primary responsibilities leads to more migration, more remittances and ever more dependency (Hernandez and Coutin 2006). Remittances may thereby unwittingly help shift the burden for ensuring economic security onto the most insecure groups in society.

Another potential concern is that easy and effortless financing of current account deficit through foreign remittances may allow the government to overlook the problems of unemployment, underdevelopment and inequality that lead to migration in the first place (Glytsos 2002, Grabel 2008). This makes the need for socio-political reforms for creating effective institutional framework less urgent (Martin 1990). In the last half century, Pakistan’s government has failed to take concrete steps for economic progress and development of the country. Unlike in the 1960s, when the push for industrial and agricultural development was spearheaded by the government, the last three decades have seen a general abdication of responsibilities by the political leadership, and the country's average GDP growth of 5 percent during that period has owed more to the entrepreneurial acumen and hard work of its masses.

Governments have cut down development budgets in the face of meagre revenues. The tax to GDP ratio has remained very low, and the agricultural sector has avoided the tax net through strong political clout. The industrial sector has shouldered the heaviest burden of taxes, and has consequently remained less productive.

Much of the taxation has been indirect, and has hurt the low and middle-income groups disproportionately. Public spending on education and health has remained low,

and Pakistan lags far behind other developing countries at similar level of economic development in various human capital indicators. By increasingly choosing to migrate, people have taken up the responsibility of their own and their households' economic uplift in their own hands. Not everyone can immigrate, though, and for most of the 180 million inhabitants of the country, prosperity and escape from poverty will still require a proactive and determined government effort. The onus for sustained growth and development lies on the government. Migration for economic reasons is a consequence of a government's failure to give its population ample development opportunities (Phillips 2009), and the resulting government complacency could compound the situation.

5.2.7 Remittance decay and future prospects

The medium to long-run prospects of remittances to Pakistan are also uncertain. The Pakistani migrant community in the OECD countries currently comprises first, second and third generation immigrants, though the share of second and third generations is probably rising. This should put an upper limit to the proportion of revenue that these migrants will be willing to continue sending. Migrants gradually assimilate in the economy of the adopted country, with the weakening of economic and social ties to the country of origin. This, of course, does not preclude the investment potential of the migrants, as has been the case with China, Taiwan etc. This notwithstanding, the remittance potential in the long run cannot be sufficient to be meaningfully integrated in a long-term development strategy.

Pakistan's remittance prospects are also threatened by the socioeconomic and demographic evolution in the host countries. In the Gulf Cooperation Council (GCC) countries, where much of the remittance flows to Pakistan originate from, the share of the young, unemployed local population has steadily grown in the recent decades⁴⁹. The local governments have accordingly been trying to improve the skill level of the local employable population and increase their participation in the private sector,

⁴⁹ Saudi Arabia's population, for instance, has grown from 9 million to 25 million in the period from 1979 to 2009, and almost half of the population is under twenty.

which has been very low so far. Employment policies like the Saudization, Emaritization and Qatarization programs are in vogue. As a result, the potential for further skilled migration from Pakistan is in jeopardy. Pakistani workers in the GCC countries are mostly temporary workers, dependent on the regular renewal of work contracts for their stay. Remittances from the region may therefore wither in the medium to long term.

Another major contributor to Pakistan's remittances, the United States, faces high unemployment in the wake of the 2008 housing and financial crisis. As a result, there is a rising social and political pressure on the governments to curb undocumented migrants who have been flooding from the south. These facts, along with the prevailing environment of mistrust and suspicion vis-à-vis the Pakistanis means that the scope for a substantial increase in migration to the US remains slim.

The situation in other OECD countries is somewhat different, as with the gradual greying of populations, several of these countries will be requiring more migrant workers to replace the aging workforce and serve senior citizens. How much of this labour demand can Pakistani migrants hope to fulfil? Given that most of these countries are far from Pakistan, and the developing countries in the vicinity of these OECD countries (North Africa and East/South-East European countries in the case of Western Europe and East/South-East Asian countries in the case of Japan) possess a large pool of relatively cheap skilled labour force, it seems unlikely that the Pakistani migrants will have much opportunity to increase their presence in these countries.

Moreover, several developing countries in Latin America and the Caribbean, Africa and South/South-East Asia have streamlined their migration processes, and are in a better position to benefit from their geographical proximity to the U.S., the European Union and the Gulf states respectively.

To sum up, both the medium and the long-run horizon of growth in remittance flows to Pakistan remain weak.

5.3 HOW CAN REMITTANCES CONTRIBUTE TO DEVELOPMENT?

How can remittances then be harnessed profitably, while at the same time meeting these important challenges? So far, the government of Pakistan has concentrated on attracting migrant remittances and investment, and has paid little attention to the potential role of remittances in the macroeconomic setup. Now, we discuss some ways in which remittances can be leveraged for development in the long run. The list of these proposals is by no means exhaustive, and can serve as a starting point for a thorough study.

5.3.1 Remittance securitization

Countries such as Brazil, Mexico, El Salvador and Turkey have been able to raise billions of dollars by securitizing their remittance flows (Ketkar and Ratha 2009). This has led to lower interest rates, longer debt maturities, higher sovereign rating and better risk profile (IMF 2010)⁵⁰. A developing country can thus access a wider range of foreign investors and improve its investment potential. By improving its credit history, the country can also ameliorate its future loan prospects (World Bank 2006). Pakistan's sovereign debt rating has traditionally remained low, and the country has had to rely on expensive Paris Club and London Club loans at high interest rates in addition to concessional loans from the World Bank, International Monetary Fund and other international financial institutions. Pakistan's total external debt stood at \$55 billion in the financial year 2010, and debt servicing costed the country about \$5.6 billion in that year (SBP 2011). The country consequently requires cheaper access to foreign funds to cover its current account deficit and to retire existing expensive foreign loans. According to Ketkar and Ratha (2009), Pakistan can have access to about US\$ 600m through remittance securitization. Pakistan can in fact raise much more than that given the much higher remittance inflows today.

⁵⁰ For a detailed account on remittance securitization, see Ratha (2007) « Leveraging Remittances for Development. » Policy Brief, Migration Policy Institute, Washington DC.

5.3.2 Banking and banking on the unbanked

Yet another step towards development can be to channel remittances into the banking sector. By promoting the recipients to open bank accounts, sizeable savings can be generated through bank deposits. This will increase loanable funds to the private sector and will bring down the double-digit interest rates. This is relevant in Pakistan's case, as excessive government borrowing has crowded out private investment, and has kept private enterprise from achieving its full potential. Channelling remittances towards the banks will help deepening the country's financial system. Given Pakistan's relatively shallow financial markets, potential savers often lack the opportunity or the wherewithal to put their savings to good use, and remittances, as a result, often end up in conspicuous consumption. By improving the access and quality of banking services available to the remittance-receiving households, savings can be efficiently channelled towards more productive investments. Promoting higher financial literacy may also be useful. The cost of remitting to Pakistan also needs to be brought down. This will require promoting competition among the providers of money transfer services. Allowing national banks and money-transferring companies to operate from, or in collaboration with, Pakistani embassies can be a step in this regard. It must be noted that efforts towards a more productive use of remittances through better transfer and banking services do not necessarily imply encouraging higher remittance receipts. The objective should, in our view, be to utilize remittances in a way that makes the economy less reliant on migration and remittances in the future.

5.3.3 Monetary and fiscal policy

In terms of macroeconomic adjustment, the country needs to rethink its monetary policy in light of the increasing importance of remittance receipts. As demonstrated by Chami et al. (2006), a country's optimal monetary policy for a high remittance-receiving economy is different from the one for an economy with no significant remittances. Keeping tab on inflation and curbing excess money supply is essential, as this not only negates the pro poverty impacts of remittances by hurting the poorest

of the poor the most, but also deters future foreign investments and puts extra pressure on the already suffering export industry.

Making the establishment of small and medium enterprises (SMEs) more convenient, and providing them with a level playing field is crucial to tackle the remittances' effects on Pakistan's international competitiveness. SMEs cannot only make use of the often small amounts of money that migrants remit, but happen to create more jobs than the capital-intensive multinational corporations. The competitiveness-affecting impact of remittances can be further checked through the judicious use of fiscal policy. Improving labour productivity through skill-enhancement programs and making the taxation regime leaner and more transparent can be steps towards this goal.

Sustained remittance flows improve the balance of payment situation, which also gives the government the possibility of enhancing public spending on infrastructure and human capital development projects. This remittance-induced improvement in public finances can be oriented to the development of the country's long-run potential. However, in the presence of chronic budget deficits and double-digit inflation, this option can be exercised only to a limited extent.

5.3.4 Remittance-matching schemes

Several governments have tried to directly involve migrant communities in the business of economic development. Mexico's 3for1 scheme, initially started as 1 for 1 and 2 for 1 program in some Mexican states in the 1980s and 1990s, and later on adopted by other Latin American countries, is a case in point. Under the "Tres por uno" scheme, the amount remitted_home by the migrant organizations known as Hometown Associations (HTAs) is matched 3 to 1 by the municipal, state and federal governments and is used to finance infrastructure and socioeconomic development projects in the respective migrant sending areas (De Graauw, 2005, Orozco and Garcia-Zanello 2009, World Bank 2006). A big advantage of this scheme is its transparency and built-in accountability, which can ensure the best return on the investment. Although 3 X 1 or other such schemes can serve as a precedent, the

national and provincial governments in Pakistan will do well to avoid this model, given its obvious implications in the country's context. Much of the remittances to Pakistan have gone to a small number of districts, which have consequently risen to the top of the national per capita rankings. The use of matching programs may concentrate even more resources in these relatively affluent regions to the detriment of other, more needful areas, and may thus sharpen the already worsening intra and interprovincial disparities. Such a scheme may not be optimally spent either, as the welfare project wishlist of the migrant associations may not be the ones with the largest payoff to the local inhabitants (Burgess 2007).

Another Mexican program, the Padrino, can suit Pakistan better⁵¹. Under this scheme, the government can propose prosperous Pakistanis each to choose a project out of a thousand or so local development projects in collaboration with local bodies. These high return projects target backward areas all over the country, and also contain the transparency feature of the 3x1 scheme. Such a scheme will however be limited to a small very well-off segment of the overseas Pakistani community.

5.3.5 Diaspora bonds

Pakistan can also tap into its diaspora's savings through diaspora bonds. In the past, Countries like India and Israel have raised tens of billions of dollars at attractive rates. These bonds represent a debt instrument issued by a country— or, potentially, by a sub-sovereign entity or a private corporation to raise financing from its overseas diaspora(Ratha et al. 2008). Diaspora bonds are often issued in times of crisis and often at a 'patriotic discount ». By launching diaspora-specific bonds, government can involve the overseas Pakistani community in the country's socioeconomic development and reduce its budgetary and credit constraints. However, the extent of participation of the migrant community is uncertain. In the past, government of Pakistan has sought overseas Pakistanis' investment through foreign currency bonds and certificates. These have included foreign currency denominated bonds and

⁵¹ For examples of the program, see Page and Plaza (2006).

foreign exchange bearer certificates (FEBCs) with higher interest rates encashable at a premium. These issues have so far had mixed results.

5.3.6 Entrepreneurial incentives

Government of Pakistan has offered the migrants various incentives to attract investment. These incentives have included tax rebate in the import of capital equipment, and business facilitation. The government established the Overseas Pakistanis foundation (OPF) with the aim of seeking and facilitating investments from Pakistani migrants. Investments by the overseas Pakistanis were facilitated in the Export Promotion Zones (EPZ) set up in selected underdeveloped areas (Amjad 1989). These endeavours have not been very successful, and few investments have been realized as a result of these schemes. One reason for limited interest from the migrants has been that several of these schemes incorrectly assumed the migrants to be entrepreneurs, which most migrants are not. Besides, in the absence of well-functioning markets and infrastructure bottlenecks, few investments can be expected.

5.3.7 Taxing remittances

A government facing chronic budget deficit may be tempted to tax remitted amounts. This must be avoided, as taxing the remittances will not only yield little in the immediate, but may also push them towards informal methods of payment once more, thereby defeating the cause altogether. Remittances are generally private transfers between the members of the same household, and they should be treated as such. The government had attempted to tax remittances in December 1975, but the effort did not succeed (Addleton 1984).

5.4 CONCLUDING REMARKS

In the light of the above discussion, remittances should be treated as a temporary flow and employed to improve the current macroeconomic situation of the country: whether as a means to access international financial markets, as a vehicle for developing and deepening the financial sector and raising the saving and investment

rates, or as a cushion for making necessary but painful fiscal reforms. Nevertheless, they should not be considered as the centrepiece of any long-term development strategy. Any such strategy should ultimately rely on the potential sustainable comparative advantages of the economy. Remittances can not do wonders if market imperfections remain rampant, and necessary systemic and institutional adjustments are not made. An economy suffering from low labour productivity and deteriorating balance of payments, with few job creation opportunities and a population with skills and eyes turned abroad is a recipe not for sustainable development, but for perpetual dependence on emigration. Besides, using remittances as a permanent source of poverty alleviation is a strategy fraught with risks as the levers of such development are bound to be away from the country, in the hands of foreign governments that - during economic downturns - often find themselves facing popular public pressure to protect local jobs at the cost of foreign labour⁵². For improving the plight of the poor, none can beat a thoughtfully planned, well-executed, more inward-looking and far-reaching development program.

In the words of Jeffrey Sachs, "A good plan of action starts with a good differential diagnosis of the specific factors that have shaped the economic conditions of a nation." In this work we attempted to shed light on the role migrant remittances can play in such a plan. In our view, a development strategy that embraces remittances as a private contribution to public welfare and as a helping hand in providing the government the financing needed for physical and human capital accumulation will be appropriate. Remittances will thus serve as a ladder to development and not as a slippery slope to dependency.

5.5 LIMITATIONS AND FUTURE RESEARCH PERSPECTIVES

In this thesis, we examined some aspects of remittance flows to Pakistan. Our work provided us with answers to some of the questions pertaining the nature and socioeconomic effects of remittances. However, many other questions remain unanswered, and some new ones arise. For instance, we were able to study the

⁵² An environment increasingly hostile to immigration in Europe and the Middle East, lively debates on illegal immigration in the US and reduction in the annual quota for skilled immigration by the Canadian government can be cited here

remittances' impact on household poverty. However, due to data limitations, we could not examine the temporal aspects of this relationship. A longitudinal household economic survey will be useful in this regard. Remittances may potentially interact with household income and consumption in various indirect ways, whether through income and expenditure multiplier effects, or through changes in investment and consumption patterns. In this work, we concentrated our attention on the direct effects of remittances. A study of the indirect effects of remittances can also help discern extent to which remittances have impacted structural poverty in Pakistan. This will require a survey of socioeconomic characteristics of the Pakistani overseas community. Such a survey will also help explore the distinct features of Pakistani migrants living in different regions of the world.

The survey will give us a better idea of the microeconomic motives to remit of the migrants. Furthermore, the survey can give the study of inequality and labour supply effects more depth. A future analysis of labour supply effects of remittances can also benefit from comprehensive data on wage rates.

Our macroeconomic study of remittances determinants lacked a potentially essential variable: number of Pakistani migrants. Availability of robust and reliable data on the size of Pakistani immigrant community all over the world can greatly improve this analysis⁵³.

Yet another future line of investigation can be to compare the characteristics of remittances to Pakistan with those flowing to other populous countries of the region. Indian Subcontinent is one of the major remittance-receiving regions in the world, and a study analyzing the similarities and differences between the behaviour of remittances to Pakistan, India and Bangladesh can shed more light on the ways and means in which migrant remittances have shaped the regional economy.

⁵³ The Organization for Economic Cooperation and Development collects data on the stock and flow of migrants in its member countries. Similarly, the United States carry out occasional detailed surveys of various migrant communities in the USA. However, given the diverse geographical profile of Pakistani migrants, no thorough and accurate surveys are yet available.

PhD is just a first step on the road to the wonderful land of research. We intend to take our pursuit further, continuing analysis some of the indicated directions. The journey will go on!

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