## CURRENCY EQUIVALENTS

**National Currency is the USS**  
*(June 2006)*

### FISCAL YEAR

**July 1 – June 30**

### MAIN ABBREVIATIONS AND ACRONYMS

| ACH / FedACH | Federal Reserve Bank's Automated Clearing House |
| AFDC | Aid to Families with Dependent Children |
| AML – CFT | Anti-Money Laundering - Combating the Financing of Terrorism |
| ATE | Average Treatment Effect |
| ATM | Automated Teller Machines |
| BANSEFI | Banco de Ahorro Nacional y Servicios Financieros |
| BBVA | Banco Bilbao Vizcaya |
| BI | Banco Industrial |
| BIS | Bank for International Settlements |
| BOP | Balance of Payments Statistics |
| CCT | Conditional Cash Transfer |
| CEMLA | Centro de Estudios Monetarios Latinoamericanos |
| CEPAL | Comision Economica para America Latina |
| CIME | Coalicion Internacional de Mexicanos en el Exterior |
| CNBV | Comision Nacional Bancaria y de Valores |
| CPI | Consumer Price Index |
| CPSS | Committee on Payments and Settlement Systems |
| EAP | East Asia and Pacific Region |
| ECA | Europe and Central Asian Region |
| ENEMDU | Encuesta de Empleo, Desempleo y Subempleo |
| FATF | Financial Action Task Force |
| FDI | Foreign Direct Investment |
| FUSADES | Fundacion Salvadorate para el Desarrollo Economico y Social |
| GDP | Gross Domestic Product |
| GEP | Global Economic Prospect |
| GMM | Generalized Method of Moments |
| HAZ | Height-for-Age Anthropometric Z Score |
| IADB / IDB | Inter-American Development Bank |
| ICRG | International Country Risk Guide |
| IFFRE | International Food Policy Research Institute |
| IHSI | Institut Haitien de Statistiques et Informatique |
| IMF | International Monetary Fund |
| INEC | Instituto Nacional de Estadisticas y Censos |
| IOSCO | International Organization of Securities Commissions |
| IRnet | International Remittances Network |
| IV | Instrumental Variables Method |
| LAC | Latin American and Caribbean Region |
| LDC | Least Developed Countries |
| LPM | Linear Probability Model |
| MECOVI | Programa para el Mejoramiento de las Encuestas de Hogares y la Medicion de Condiciones de Vida en America Latina y el Caribe |
| MIF | Multilateral Investment Fund |
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ACKNOWLEDGMENTS

The Development Impact of Remittances in Latin America is the product of a collaborative effort of two units of the Latin American Region of the World Bank: the Chief Economist Office and the Finance, Private Sector and Infrastructure Group. The report was prepared by a team led by Pablo Fajnzylber and Humberto Lopez, and comprising Pablo Acosta, Cesar Calderon, Massimo Cirasino, Paola Granata, Mario Guadamillas, Maria Soledad Martinez Peria, Yira Mascaro, Florencia Moizeszowicz, Caglar Ozden, Pedro Olinto, and Emanuel Salinas. Luis Molina, from the Bank of Spain, also collaborated with the project while he was visiting the World Bank in early 2006. Guillermo Beylis and Namsuk Kim provided excellent research assistance at different times during the project.

Extensive and excellent advice has been received from Guillermo Perry, Susan Goldmark, Ernesto May, Maurice Schiff, Jose Guilherme Reis, and especially from our peer reviewers, Omar Arias, and Samuel Muzele Maimbo. Comments on some of the background papers for this report were also received from many participants at the Latin American Region seminar series on Remittances and Development organized in the context of this project, as well as from Makhtar Diop, Edmundo Murrugarra and Dante Mossi. Ernesto Lopez Córdova, Jose de Luna Martinez, Manuel Orozco and Anna Paulson provided the data and information used in Chapter 5. To all of them we are grateful without implication.
Chapter 1

How important are remittances in Latin America?*

Workers remittances have become a major source of financing in developing countries reaching levels that are comparable to those of Foreign Direct Investment and doubling those of Official Development Aid. However, there are a number of questions that are critical for determining the development impact of remittances in Latin America: how important are those flows in the regional context and how have they evolved over the past years? What do we know about remittance recipients at the country and household level? Are they the poor or instead they belong to more accommodated classes? Are the observed patterns similar across various Latin American countries? Finally, can we rely on official statistics?

I. Introduction

Workers remittances have become a major source of financing in developing countries. According to the World Bank’s *Global Economic Prospects 2006*, in 1990 remittances to middle and low income countries amounted to about US$31 billion. Fifteen years later, they are estimated to have reached US$167 billion, of which about one-fourth to the Latin American and the Caribbean Region (Latin America henceforth). Workers remittances now account for about 30 percent of total financial flows to development countries, are more than twice as large as official development assistance flows, and represent the equivalent to 2.5 percent of the gross national income of the developing world.

The raising importance of remittances flows has been reflected in the increasing attention being devoted to the issue by development practitioners both in academic and policy circles. At the academic level, a number of recent papers have explored the impact of remittances on poverty (Adams and Page, 2005; Page and Plaza, 2005, Acosta et al. 2006a, and Acosta et al. 2006b), inter-temporal consumption smoothing (Yang, 2005), growth (Ruiz Arranz and Giuliano, 2005; Calderon, Fajnzylber and Lopez, 2006), risk management (Amuedo-Dorantes and Pozo, 2004), education (Cox and Ureta, 2003), labor supply (Rodriguez and Tiognson, 2001), and external competitiveness (Amuedo-Dorantes and Pozo, 2004; Rajan and Subramaian, 2005).

* This chapter is based on the background paper for this report “Remittances and Development in Latin America” by Pablo Acosta, Cesar Calderon, Pablo Fajnzylber, and Humberto Lopez.
At the policy level, the International Monetary Fund (IMF), the World Bank, and the United Nations Development Program (UNDP) have all addressed the growing importance of migration and remittances and their impact on development efforts in some of their flagship publications. For example, the IMF’s *World Economic Outlook 2005* devoted significant attention to the determinants and implications of inflows of workers’ remittances, whereas the World Bank’s *Global Economic Prospects 2006* had as its central topic the economic implications of remittances and migration. The World Bank has also edited a number of volumes on migrations and remittances issues (see Maimbo and Ratha, 2005, and Ozden and Schiff, 2006). Similarly, the UNDP’s 2005 *Human Development Report* for El Salvador focused heavily on the development impact of remittances and the UNDP is now organizing a high level meeting on the topic to be held in New York in the fall of 2006.

Yet, to a large extent the existing works have focused on the role of remittances (and/or migration) at the global level with relatively little attention paid to regional specific issues. This is an important limitation because if, as discussed in Chapter 2, the migration patterns of the Latin American region differ significantly from those of other regions, then it is possible that findings based on studies relying on global databases are not fully applicable to the Latin American context. True, there are also works based on country cases studies that focus on Latin American economies. However, these tend to be based on a limited number of countries (typically Mexico, El Salvador and Guatemala) and have important methodological differences among them, something that in turn makes it difficult to easily extend and generalize the obtained results to the region.

This regional study tries to somewhat fill the existing knowledge gap for Latin America. To start with, in this chapter we explore the basic facts of remittances to the region. Among others, we address the following questions: how much and how relevant from an economic perspective are these flows? How have they evolved over the past few years? Are they leveling off or instead continuing to increase? What do we know about those at the receiving end of the remittances chain? Are they the poor or instead they belong to more accommodated classes? What is their level of education? Finally, to what extent can we trust statistics on officially recorded remittances?

II. The magnitude of remittances flows: the global picture

According to Balance of Payments Statistics\(^1\) officially recorded remittance flows to developing countries reached US$167 billion in 2005, of which about US$42 billion to the Latin American region. This would make Latin America together with East Asia and the Pacific (East Asia henceforth) the two top remittances receiving regions of the world (Figure 1.1, Panel A).

\(^1\) We would like to note that the BOP based remittance figures used throughout this report do not exactly coincide with the line workers remittance of the BOP statistics. The data we use, which comes from the *World Economic Outlook 2005* database, are (with some exceptions for which we refer the reader to the *World Economic Outlook 2005*) constructed as the sum of three BOP items of the *Balance of Payment Statistics Yearbook* (IMF): workers’ remittances (current transfers made by migrants who are employed and resident in another economy); compensation of employees (wages, salaries and other benefits earned by nonresident workers for work performed for residents of other countries); and migrant transfers (financial items that arise from the migration or change of residence of individuals from one economy to another).
Latin American and East Asia would be followed by South Asia with about US$32 billion, Europe and Central Asia, and the Middle East and North Africa (about US$20 billion each) and finally Sub-Saharan Africa, the region with the lowest official remittances flows (US$8 billion). Not only East Asia and Latin America are the two top receiving regions of the world, but also they are the two regions that have experienced the highest growth in officially recorded remittances since 1990 with annual growth rates of 19 and 14 percent respectively (Figure 1.2, Panel A). This would be in contrast to the Middle East and North Africa where over the past 15 years remittances have increased at a rate below 5 percent. At the global level remittances are estimated to have increased at an annual rate of 12 percent since 1990.

To put this figure in context, it is worth noting that (i) at this growth rate remittance flows double every 6 years approximately; and (ii) the median GDP per capita growth rate for the developing countries over the past 15 years was below 1 percent per year.

**Figure 1.1. Regional distribution of remittances**

| Legend: EAP: East Asia and Pacific; ECA: Europe and Central Asia; LCR: Latin America and the Caribbean Region; MENA: Middle East and North Africa; SA: South Asia; SSA Sub-Saharan Africa. |

The previous ranking based on total remittance flows hides, however, an important factor regarding the relative regional importance of remittances for development purposes, namely the fact that the population of the different regions is also dramatically different. For example, East Asia has remittances flows that are similar to those of Latin America but the population of East Asia is almost four times as large as the Latin American.

In fact, when we take into account the existing differences in the population on the regions and compute remittances on a per capita basis, Latin America would be the top receiving region (Figure 1.1, Panel B) with almost US$80 per person per year (table 1.1). This amount is more than twice as large as that of the developing world as a whole (US$31 per person per year). On a per capita basis Latin America would be followed by the Middle East and North Africa (US$69), Europe and Central Asia (US$42), East and South Asia (about US$23), and Sub-Saharan Africa which with US$11 per person per year is also the lowest receiving region on a per capita basis. Regarding growth rates of per capita remittances, East Asia continues to be the
region with the higher growth rate, and now Latin America would be joined by Europe and Central Asia in the second place of the ranking (Figure 1.2, Panel B).

Figure 1.2. Annual growth rate of recorded remittances (1990-2004)

Panel A. Total Flows

Panel B. Per capita

Legend: EAP: East Asia and Pacific; ECA: Europe and Central Asia; LCR: Latin America and the Caribbean Region; MENA: Middle East and North Africa; SA: South Asia; SSA Sub Saharan Asia.

Source: GEP and WDI.

The relevance of workers’ remittances is also apparent when we compare them with other international financial flows (both private and official) to low and middle income countries. As table 1.1 indicates, remittances represent about 30 percent of the US$572 billion total internal financial flows to the developing world, and are estimated to have reached levels equivalent to 80 percent of foreign direct investment (FDI) flows to developing countries (US$211 billion) and exceed official development assistance (ODA) flows by about US$100 billion. Remittances are also larger than private non-FDI flows, such as portfolio investment and Bank and trade related lending (US$115 billion). In relation to other financial flows, remittances are particularly important in South Asia, the Middle East and North Africa, and Latin America. In the first two regions, they would account for more than half of the total international flows received whereas in Latin America they would represent about 40 percent.

Table 1.1. International flows to low and middle income countries

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<th>Remittances</th>
<th>Remitt. pc</th>
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<th>Private non-FDI</th>
<th>ODA</th>
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<td>211384</td>
<td>115339</td>
<td>68933</td>
</tr>
</tbody>
</table>

Last available estimates.
Source: GEP and WDI

It is worth noting that this situation is radically different from the existing in 1990 when ODA flows accounted for almost half of the financial flows to developing countries (figure 1.3). In fact, over the past 15 years private flows have increased dramatically at the cost of official flows, and in this regard workers remittances are not an exception.
III. The magnitude of remittances flows: the regional picture

The growing importance of remittances to the Latin American region is reflected in Figure 1.4 where we report the annual evolution of these flows for 31 Latin American countries over the period 1980-2004. This figure indicates that officially recorded remittances flows to the Latin American Region have increased twenty-fold since 1980 when remittances amounted to about $1.9 billion. What is more relevant, this figure does not give any indication of remittances flows leveling or stabilizing. Actually, if anything the figure indicates that there is a clear upward tendency underlying the data to the point that a simulation of the evolution of remittances under the assumption of a continuous trend would result in remittances of about US$75 billion in 2007. While this estimate is likely to be on the high side of what one could expect, it nevertheless highlights the fact that a collapse in remittances does not seem very likely over the short run. In other words, it is not unrealistic to assume that remittances are here to stay at least in the short run.

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2 For 2004 the data is estimated. It must be clarified that data on remittances’ receipts are not available each year for all countries. In fact, it is possible to gather complete time series for only 14 countries during this period: Mexico, Colombia, Brazil, Guatemala, El Salvador, Dominican Republic, Haiti, Jamaica, Honduras, Argentina, Costa Rica, Paraguay, Bolivia and Barbados, ordered descending according to the total value of remittances received during 2003. On a more positive note, these countries were recipient of 90 percent of total officially recorded remittances flows to Latin America in 2002, a year for which information is available in all 31 countries (details on available BOP data coverage for each country can be found in the Appendix of Acesta, Calderon, Fajnzylber, and Lopez, 2006a). Figure 1.4 then assumes that the 90 percent ratio has kept constant over time (i.e. it extrapolates the data using a constant factor for every year).

3 It is highly likely that the evolution of officially recorded remittances is driven not only by an increase in actual remittance flows but also by improvements in the quality of the statistics and in recording procedures by the different statistical offices. Once these statistics start reaching a good degree of accuracy the increase in officially recorded remittances is likely to, ceteris paribus, decline significantly.
It would be possible to argue that the previous figures have been artificially inflated by considering them in current rather than constant US$. And in fact, once we take into account the contribution of US inflation, the over time increase in remittances flows becomes less marked. Yet, in 1980 prices today’s remittances flows would still be above US$20 billion (i.e. in real terms remittances have increased more ten fold over the past 20 plus years). Or consider the evolution in terms of the region’s GDP. In that case, remittances have also increased dramatically since 1980 when they represented a mere .3 percent of GDP to about 2.2 percent today. In other words, no matter how one looks at the evolution of remittances, the message that emerges is that they have increased significantly over a sustained period of time.

At the country level, Panel A of Figure 1.5 reports the remittances to GDP ratio for a number of Latin American countries in 2004, and table 1.2 reports remittances’ annual flows, and growth rates for each country in the region between 2002 and 2005 – with preliminary estimates in the case of the latter year. These figures indicate that remittances represent more than one half of GDP (52.7 percent) in Haiti, a ratio that is the highest in the world – Haiti is closely followed by Tonga, where in 2004 remittances represented 51.3 percent of GDP. A second tier of countries with high remittances to GDP ratios includes Jamaica (17.1 percent in 2004), Honduras (15.6 percent), and El Salvador (15.3 percent). Similarly, in Guatemala, Nicaragua and the Dominican Republic remittances are between 10 and 12 percent of GDP. The importance of those flows can also be illustrated by comparison with other private capital flows. Thus, in Guatemala, Honduras, El Salvador and the Dominican Republic, remittances are equivalent to respectively 14, 4, 3 and 2 times FDI flows. Even in Colombia and Ecuador, where in relative terms remittances are lower than in several Central American and Caribbean countries, remittances represent respectively 197 and 112 percent of FDI.
Table 1.2. Recent remittances flows to Latin America and the Caribbean (2002-2005)

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<tr>
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<td>38.2</td>
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<td>317</td>
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<td>1.4</td>
<td>1.3</td>
<td>1.9</td>
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<td>3.9</td>
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<td>1.0</td>
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<td>1.4</td>
<td>1.5</td>
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<td>4.0</td>
<td>3.4</td>
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</tr>
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<td>0.3</td>
<td>0.2</td>
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<td>Suriname</td>
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<td>21.4</td>
<td>12.4</td>
<td>1.6</td>
<td>2.3</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Source: Own calculations using BOP and WEO data. Preliminary estimates.
Figure 1.5. Remittances to Latin America in 2004

Panel A. (% of GDP)

Panel B. (US$ millions)

Panel C. Per capita

Source: Own calculations using BOP data
The classification of recipients changes significantly on a US$ basis. Overall, the country with the highest absolute remittances flows (Panel B of Figure 1.5) is Mexico, which received $21.8 billion in 2005. This would represent 45 percent of total flows to Latin America in that year ($48.3 billion) and would make Mexico the largest world recipient in 2005, followed by India, Philippines, China and Pakistan, with respectively $12.1, $9.8, $6.9 and $5.8 billion. Colombia and Brazil are ranked 9th and 11th among the top remittance receiving countries in the world, with flows of respectively $3.8 and $3.5 billion in 2005. Other countries with more than $2 billion of remittances inflows in 2005 ($2.5 billion on average) include Guatemala, El Salvador, the Dominican Republic and Haiti. Also worthy of note are Ecuador, Honduras, Jamaica and Peru, where remittances averaged $1.6 billion in 2005.

On a per capita basis (panel C of Figure 1.5) the country with the highest level of remittances would be Jamaica with approximately $550 per capita, followed by Barbados with about $400 per capita and El Salvador with flows of approximately $350. The average for the 28 countries being considered here would be $128 per capita per year, but that amount increases to $270 among the ten countries with highest per capita remittances – a group that also includes the Dominican Republic, Haiti, Antigua and Barbuda, Guatemala, Mexico, Honduras, and Trinidad and Tobago.

It is also worth noting that between 2002 and 2005 remittances to Latin America are estimated to have grown at a rate of 18.7 percent per year. While this rapid growth has been largely driven by Mexico’s 25 percent annual growth in remittances flows, annual rates close to or above 20 percent have also been observed in Guatemala, Honduras, Nicaragua, Costa Rica, Trinidad and Tobago and Peru (Table 2.5).

IV. Profile of recipients

The BOP data reviewed in the previous section allows for a cross country comparison of remittances. Yet, it gives no information about those at the receiving end. For example, are those receiving remittances the poorest groups in society so that remittances can be expected to have a large impact on poverty reduction? Or instead are they from more accommodated classes so that remittances, while certainly increasing welfare in the recipient country may not have that much of an impact on poverty? In order to address these issues, it is necessary to have household specific information and therefore a natural way forward is looking at household surveys.

Unfortunately, nationally representative household surveys with specific questions on remittances are only available for eleven Latin American countries: Haiti, El Salvador, Honduras, the Dominican Republic, Nicaragua, Guatemala, Ecuador, Paraguay, Mexico, Bolivia and Peru. On a more positive tone, it is worth noting that in terms of BOP data these countries would represent more than two-thirds of remittances to the Region.

We next review the profile of recipients that emerge from these household surveys.

---

* A twelfth country with data on remittance receipts is Jamaica. Unfortunately as the household survey of reference does not include information on other income sources (i.e., labor income), it is not included in the analysis that follows. Nevertheless, the Jamaican case is explored in Chapter 4 (remittances and household behavior).
How many households receive remittances?

The number of households receiving remittances in the Latin American region varies significantly across countries (figure 1.6). For example, in Haiti more than 25 percent of the households reported having received remittances in 2001. At the other extreme, only 3 percent of the Peruvian households would benefit from these flows. In between, remittances reach between 10 and 25 percent of the households in the Dominican Republic, El Salvador, Nicaragua, and Honduras; between 5 and 10 percent in Mexico and Guatemala; and finally between 3 and 5 percent in Bolivia, Ecuador and Paraguay. Thus remittances are quite a popular phenomenon in these countries.

![Figure 1.6. Share of household receiving remittances](image)

Source: Own calculations using household data

Who receives remittances in Latin America?

A natural question that arises from the previous discussion regards the situation along the income distribution of those households receiving remittances. Figure 1.7 shows the relative position of Latin American recipient families according to income quintiles both for non-remittances income and for total income (i.e. including remittances) for the eleven Latin American and Caribbean countries for which remittances micro-data are available. The figure is computed by averaging the results for the individual countries (see also below for country details).

Inspection of this figure reveals two important elements. First, the income data that excludes remittances indicates that, on average for the 11 countries under analysis, 30 percent of the households receiving remittances are in the lowest quintile of the income distribution; the remaining 70 percent would be distributed more or less homogenously over the 4 richest quintiles. In other words, remittance flows seem to be directed to all income groups but the weight of the poorest families appears to be larger than the weight of everybody else. Second, once we take into account remittances income, recipient households climb up significantly in the income ladder. In fact, after we take into account the role of remittances only 10 percent of the
households which receive them belong to the lowest quintile of the income distribution. In contrast, on the basis of total income more than 30 percent of the households receiving remittances would now be in the highest income quintile. Thus, this aggregate analysis indicates that remittances seem to have a positive impact on the incomes of the poor.

Figure 1.7. Households receiving remittances by quintile of the income distribution

Panel A. Non-remittances income

Panel B. Total income

Source: Own calculations
The figure reports the percentage of households receiving remittances that fall in each of the five quintiles of the income distribution, when reported remittances are excluded from reported income.  
Source: Own calculations using the last available household survey.
Figure 1.9. Households receiving remittances by quintile of the total income distribution

The figure reports the percentage of households receiving remittances that fall in each of the five quintiles of the total income distribution (i.e. when reported remittances are included from reported income).

Source: Own calculations using the last available household survey.
The data underlying figure 1.7, however, show significant country heterogeneity (figure 1.8), and while it is clear that in many cases migrants and recipient families tend to come from definite socioeconomic segments of the society, those segments considerably vary across Latin American countries. For instance, in the case of Mexico, remittance recipients are predominantly poor: 61 percent of the households that report receive remittances fall in the first quintile of non-remittances income whereas only 4 percent of them would be in the top quintile. Similarly, in Paraguay 42 percent of recipients are in the first quintile of the distribution and only 8 percent are in the top quintile. Other countries where at least 30 percent of remittances recipients are in the lowest quintile (i.e. where there flows tend to be directed towards the lower quintile) are Ecuador, El Salvador, and Guatemala.

In contrast, in Peru and Nicaragua the distribution of remittances across households is completely different. For example, in Peru less than 6 percent of the households that receive remittances belong to the lowest quintile while 40 percent belong to the top quintile. Or take the case of Nicaragua, where only 12 percent of the recipients are in the first quintile while 33 percent belong to the fifth quintile. Thus in these two countries remittances seem to be flowing towards the richest.

In between the group of Mexico, Paraguay, Ecuador, El Salvador, and Guatemala, and the group of Peru and Nicaragua, there are four countries (Bolivia, Honduras, the Dominican Republic and Haiti) where remittances appear to be homogeneously distributed across the distribution of income, or exhibit a U-shaped distribution (i.e. remittances flow towards the poorest and the richest in the same proportion and more than towards the three middle deciles).

This situation changes dramatically when we analyze the economic status of recipients on the basis of total income (including the value of remittances). In fact, figure 1.9 suggests that (i) the share of recipients that belong to the lowest quintile falls dramatically in all the countries; and (ii) with the exception of Mexico and to a lesser extent of Paraguay and of El Salvador where 50, 40, and 34 percent of recipients respectively continue to be in the first and second quintiles, in the rest of the countries more than half of recipients are now in the two highest quintiles. Not surprisingly, this concentration is particularly marked in those countries where migrants seem to come from richer classes. Figure 1.9 indicates that in Peru more than 75 percent (50 percent) of recipients are now in the highest two (top) quintiles of the income distribution. The situation is similar in Nicaragua, a country where more than 60 percent of recipients belong to the top two quintiles. Thus, on the basis of this analysis one would expect that remittances may have quite different inequality and poverty impacts in different countries.

Remittances and education

Understanding the selectivity process of migration is important in order to evaluate the overall impact of migration on poverty and inequality (see Acosta, Calderon, Fajnzylber, and Lopez, 2006b for a technical discussion of the relevance of selectivity issues in this context; see also Chapters 3 and 4 for a more basic discussion). One important dimension of the selection into migration process is likely to be related to the patterns of educational attainment patterns in the households with migrants, and ideally we would like to compare the educational attainment
of migrants and non-migrants. Unfortunately, the only survey that contains information on migrant’s education is Nicaragua (2001).

**Figure 1.10. Educational characteristics of households receiving remittances**

The figure reports the educational profile of households receiving remittances that fall in each educational group. Source: Own calculations using the last available household survey.
According to that survey, the average education of adult migrants is 6.83 years, while non-migrant adults have on average 5.61 years of education, which reinforces the idea emerging from figures 1.8 and 1.9 that migrants are positively selected in Nicaragua (see also Chapter 2 for a discussion of the education profile of LAC migrants in the US). For the rest of the countries, the only relevant information available relates to the schooling of migrants’ family members. However, the evidence for Nicaragua suggests that the level of education of migrants closely resembles that of non-migrant adult members in the same households. In other words, it seems that one can get a good approximation of the patterns of educational selection into migration using data on adult family members left behind by migrants.

With this motivation, figure 1.10 presents the incidence of remittance recipient households throughout the distribution of the average years of schooling of adults aged 16 to 65. For example, in the case of Nicaragua only 10 percent of those without education receive remittances whereas about 30 percent of those with 12+ years do. Similarly, in Peru only 2 percent of those without education are recipients against 6 percent of those with 12+ years. That is, remittances are relatively more important among those with higher education than among those with lower educational levels. On the contrary, in Mexico, Paraguay or Ecuador recipients tend to be more representative among the less educated groups. Take the case of Mexico, where between 10 and 15 percent of those with less than 4 years of education receive remittances against less than 2.5 percent among those with 12+ years. Or take the case of Paraguay where the corresponding shares for least and most educated groups would be 8 and 3 percent. In these two cases, remittances are relatively more relevant among less educated groups.

Table 1.3 shows the proportion of households with migrants across the educational distribution of the four countries (El Salvador, Haiti, Honduras and Nicaragua) for which information is available not only on households with remittances receipts but also on household with members who have migrated abroad. In El Salvador, 14.5 percent of the surveyed families reported having international migrant members, while 19.3 percent of them receive remittances — including money received from distant family members and friends abroad. The equivalent figures for Haiti, Honduras and Nicaragua show that respectively 29.9 percent, 10 percent and 12 percent of the families have migrants, but respectively 27.2 percent, 10.9 percent and 15.6 percent receive remittances.

Table 1.3. Migration and Education

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<th>Haiti</th>
<th>Nicaragua</th>
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<tr>
<td>Avg. educ migrants HHS</td>
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<td>6.09</td>
<td>3.91</td>
<td>6.36</td>
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</table>

The table reports the % of migrants by average years of education in the household.

Source: Own calculations using household survey data

In Nicaragua, the average years of schooling of adults in households with migrants is 6.66, compared to 6.83 for migrants, and 5.61 for adults in non-migrants households.
Overall the results indicate the presence of negative educational selection into migration in Mexico, Guatemala, El Salvador and Paraguay, and of positive educational selection in Haiti, Peru, Honduras, the Dominican Republic and Nicaragua. Our finding for Mexico is consistent with Ibarraran and Lubotsky (2005), who show that Mexican migrant families tend to be less educated than their non-migrant counterparts. The evidence presented here is less conclusive for Bolivia and Ecuador, where migrants are likely to be drawn from several segments of the educational distribution.

Figure 1.11. Average annual amount reported by recipients

Panel A. US$

Panel B. Percent of income

LAC refers to the un-weighted average of the 11 countries in the figure.
Source: Own calculations using the last available household survey.

It is also worth noting that Mexico, Guatemala and El Salvador are the three Latin American countries whose migrants in the US have the lowest educational levels (see chapter 2).
Figure 1.12. Income share of remittances by income quintile (recipients only)

Bolivia

Ecuador

El Salvador

Guatemala

Haiti

Honduras

Mexico

Nicaragua

Paraguay

Source: Own calculations using the last available household survey.
How important are remittances for recipients?

An issue of particular interest to infer the relevance of remittances in this context is the amount received by recipient households. Figure 1.1 addresses this issue and suggests that for the 11 countries under analysis, on average, the typical household receiving remittances reports about US$500 per year (panel A). Here, there is also significant variation and whereas in the Dominican Republic, Mexico and Honduras remittances may be close to US$900 per receiving household per year, in Nicaragua and Haiti they would be much smaller. In fact, in Nicaragua household remittances would be estimated at about US$120 per receiving household whereas in Haiti they are estimated at US$191. Among the remaining countries, Peruvian and Ecuadorian households would report receiving between US$600 and US$700, Salvadoran US$430, and Guatemalan, and Paraguayan between US$200 and US$400.

The country variability is much smaller when we look at remittances as a share of the income of the receiving families. In fact, apart from Nicaragua and Peru, remittances tend to represent between 30 and 50 percent of household income (Panel B). However, much more variation across countries is observed in the manner in which the share of remittances in recipient households’ income varies across income quintiles. Indeed, as seen in figure 1.12, while the income share of remittances is generally higher among recipient households located in lower income quintiles – the rich are less dependent on remittances than the poor – the decline as ones moves up in the income distribution is quite slow in some countries and very fast in others. As an example of the former case, in Mexico, Haiti, Paraguay and Bolivia the decline in the share of remittances in income from the bottom to the top quintile is of about 10 percent. In other words, in these countries the share of remittances in income is very similar in poor and rich households. In the other extreme, in Guatemala and El Salvador remittances represent respectively 63 and 55 percent of income in households located in the first income quintile, but they fall to less than 20 percent of income among households in the fifth quintile. Similarly, in Peru and Nicaragua remittances are 50 percent lower as a percentage of recipients’ income in the bottom compared to the top quintile. Honduras and Ecuador are in an intermediate position, with declines in the income share of remittances among recipients of about 30 percent from the first to the fifth quintile.

How regressive is the distribution of Remittances Income?

Given that a larger share of recipients tend to be located in the upper quintiles of the income distribution (figure 1.9) – the only exception being Mexico – the finding that remittances are higher as percentage of poor recipients’ income compared to their richer counterparts (figure 1.12) does not imply that remittances have a progressive effect on the distribution of income. In fact, as seen in figure 1.13, with the only exceptions of Mexico, El Salvador and to a lesser extent Paraguay and Guatemala, remittances are a bigger share of total income in the upper quintiles of the income distribution – considering all households in each quintile, regardless of their remittances recipient status. Thus, for instance, in Haiti, almost 25 percent of the income of households in the top quintile comes from remittances, compared to respectively 5 and 10 percent for the first and second quintile. Large differences of this sort are also found in the Dominican Republic and Honduras, where among the richest 20 percent remittances represent
respectively 11 and 8 percent of total income, compared to an average of 5 and 3 percent respectively for households in the two lowest quintiles.

**Figure 1.13. Income share of remittances by income quintile (all households)**

Source: Own calculations using the last available household survey.
Figure 1.14. Income and Remittances Distribution by income quintile

Source: Own calculations using the last available household survey.
More direct evidence on the extent to which remittances have a regressive effect on the distribution of income is provided in figure 1.14, which reports each quintile’s share of both total income and total remittances. The results suggest not only that remittances are distributed in a quite unequal fashion, but also that that are generally distributed more unequally than total income. Thus, in the 11 countries for which we have data the first three quintiles – the poorest 60 percent of the population – receive only a quarter of total remittances, while the top quintile receives on average 54 percent of those flows. For comparisons purposes, on average the richest 20 percent respond for 51 percent of total household income, which suggest that the distribution of remittances is only slightly more unequal than that of income. Figure 1.14, however, reveals that in the cases of Mexico, El Salvador, Guatemala, and Paraguay remittances are less unequally distributed than total income – e.g. the poorest 60 percent receive 41 percent of remittances compared to 29 percent of income. In contrast, in the other 7 countries the first three quintiles respond for only 16 percent of total remittances, compared to 26 percent of total income, thus suggesting that remittances have a regressive effect on the income distribution. While these calculations are subject to a number of caveats which we address in detail in chapter 3 – e.g. in the absence of remittances households would probably have generated incomes that are likely to be higher than the observed non-remittances income – the evidence so far does not suggest that remittances could play an important role in reducing the very high levels of income inequality observed in Latin America.

V. How reliable are remittances figures?

So far we have reviewed the magnitude of remittance flows to the Latin American region, their evolution over time, and the profile of receiving households. Yet we have also mentioned that remittances data can be subjected to significant mismeasurement issues to the point that it could be possible that part of the observed upward trend in observed remittances is simply driven by improvements in recording procedures. This clearly raises many questions regarding the quality and coverage of the data with which we have been working, which could in turn affect the robustness of the analyses based on these data. In other words, casual evidence indicates that there may be important deficiencies with the officially recorded statistics on remittances. In this section we perform an exercise that we hope will give some indications of the extent to which the data described in this chapter can be trusted.

Remittances data are typically computed from Balance of Payments statistics for aggregate analysis and from household surveys for country specific studies. As argued in the World Bank’s Global Economic Prospects 2006, there are a number of reasons of why these two sources may not coincide. To start with, there is not a single definition of remittances. Should they just include current transfers by migrants that are employed and resident in another country, or should they also include compensation of employees (i.e. current transfers by nonresident workers)? Similarly, what should be the treatment of migrants’ transfers (i.e. financial items that arise from migration from one economy to another)?

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7 Indeed remittances from these two sources of data rarely coincide for individual countries.
Moreover, even when one agrees on a common definition there are still a number of important issues that may affect the quality of the data. In addition to the implicit difficulties of capturing flows through informal channels, weaknesses in data collection may imply that many formal flows, especially if small, go unrecorded or are misclassified as tourism receipts or nonresident deposits.

On the other hand, household survey based remittances have also a number of associated problems. First, the corresponding household survey may not be as “national representative” as it should. Moreover, even if the household is representative for the purposes of analyzing income levels, it may not be representative when the focus is the analysis of migration and remittances. A second aspect would be related to possible recall bias estimates of remittances’ receipts: families usually decide to pool their income regardless of their source, and therefore are presumably more likely to remember whether they received financial aid from abroad or not, than to remember the exact amount.

Finally, the timing of the survey data collection may also have an impact. Anecdotic references suggest that remittances’ flows tend to be highly volatile within a year, with peaks at particular dates (i.e., Christmas, Mothers’ Day, and birthdays). If survey data do not ask for the amount perceived as remittances during the whole year period (as in the case of the Dominican Republic, Ecuador, Paraguay and Peru, for instance), depending on the data collection period, remittances could be underestimated.

Similarly, in countries with volatile exchange rates, it is difficult to value (in dollars) the amounts remitted when they are reported in local currency values (as in the majority of household surveys). Yet, if official figures are reliable one could also expect a strong positive correlation between the \textit{Balance of Payments} based and household based estimates.

Figure 1.15 compares the estimates (as a ratio to GDP) obtained using the two available sources of data that we have for the eleven Latin American countries for which the household surveys report data on remittances. Inspection of this figure suggests a number of interesting issues. First, BOP based estimates tend to be larger than household survey data estimates. The only case where the latter is higher is Mexico and only by .1 percentage points. Second, the discrepancies can be very important. For example, in the cases of Haiti and El Salvador BOP based data produce estimates that are 10 percentage points of GDP higher than Household survey data. In Nicaragua, the differences are smaller but still of a substantial magnitude (about 6 percent of GDP). The median remittances to GDP ratio for the 10 countries under analysis would be 4.7 percent on the basis of the \textit{Balance of Payments} data and 2.7 on the basis of household survey data.

It is worth noting, however, that these discrepancies may be more predictable than they appear. Or in other words that the observed discrepancies reflect systematic differences more than unexplained gaps. In fact, Figure 1.15 indicates that after a logarithmic transformation the \textit{Balance of Payments} and household based series of remittances are strongly correlated: the estimated R$^2$ of a simple OLS regression is almost .80 indicating that most of the variance in observed \textit{Balance of Payments} based figures can be explained with the findings of household survey data.
The slope of the regression line, estimated at .94, is also quite close to 1. Even though if by working with a sample size of just 11 observations we cannot pretend to do rigorous statistical inference it is worth noting that the null hypothesis that this slope is equal to zero is rejected by the data whereas the null of being equal to 1 cannot be rejected. In other words, the differences in the estimated remittance flows emerging from the two different sources of data seem to be more a question of scale.

These results, which are virtually unchanged when Haiti is eliminated from the sample to control for extreme values, would suggest that a good rule of thumb relating remittances from these two sources would be given by:

\[ \text{BOP Remittances} = 1.73 \times (\text{HH Remittances}) \]

In other words, Balance of Payments based remittances statistics tend to be on average 70 to 75 percent larger than household based data.

**Figure 1.15. BOP based versus household based remittances**

In other words, Balance of Payments based remittances statistics tend to be on average 70 to 75 percent larger than household based data.

**VI. Conclusions.**

This chapter has reviewed the evolution of remittances flows to Latin America using both balance of payments statistics and household survey data from eleven Latin American countries. It has also explored the varying economic and educational profile of the households that receive remittances using household survey data from those eleven countries. It has been argued that remittances flows to Latin American are very important regardless of whether one looks at them as total flows (about US$40 billion), per capita flows (US$80 per person per year), their contribution to total financial flows (about 40 percent), or their share of regional GDP (2.2 percent). The chapter has also noted that remittances have dramatically increased over the past 25 years (twenty-fold in nominal terms and ten-fold in real terms), and that there is no indication...
of them leveling off. At the country level, they are relatively most important among Central American and Caribbean countries.

As for the characteristics of remittance receiving households, the analysis of household survey data indicates that their distribution by income and adult educational attainment varies considerably across Latin American countries, with households with remittances income coming mainly from the bottom of the distribution in some countries – e.g. Mexico and Paraguay – but an opposite pattern being found in others – e.g. Haiti, Peru and Nicaragua. This would indicate that the impact of remittances on poverty and inequality cannot be expected to be the same across the different countries of the region.

Finally, it has also been noted that *Balance of Payments* statistics and household survey data do indeed produce dramatically different estimates of the importance of remittances for receiving countries. However, the differences between those two data sources appear to be somewhat predictable, something that at least in our sample should ease concerns about data quality.
Chapter 2

Before workers’ remittances, workers’ migration *

Migration and remittances are two faces of the same coin. While workers’ remittances would not occur if those sending them had not migrated in the first place, migration is often motivated by the desire to improve the welfare of those left behind, mainly by sending them money. Thus, migration profiles in terms of destination and characteristics are likely to influence remittance patterns. The present chapter aims to describe Latin American migration in an international perspective, and relate it to the remittances patterns that are sent home by the region’s migrants. What do we know about the destinations chosen by Latin American migrants? What are the age and education profiles of the region’s migrants and what is their labor market performance in destination countries? How do these characteristics affect remittances flows?

I. Introduction

There are many countries in the world for which migration is a key economic and social issue. For many small countries, like Tonga and Moldova, remittances account for the largest portion of their capital inflows. Larger countries, such as Sri Lanka, Bangladesh and the Philippines, have millions of citizens for whom working abroad for several years at a time is an important economic activity. Countries like India, Korea and Taiwan, have seen some of their most educated workers migrate abroad over the last three decades, but they also have benefited tremendously through the closer economic links these migrants established between their native and adopted countries. For others with large diasporas in Europe, such as Turkey, ex-Yugoslav Republics and the North African countries, migration poses complex cultural challenges in addition to economic ones.

The experiences of Latin American countries have certain similarities with some of the examples mentioned above. As discussed in Chapter 1, remittances are extremely important for many of the countries in the region and there are countries like Haiti where remittances are close

* This chapter is based on the background papers for this report “Migration Patterns in Latin America and the Caribbean: An Overview of Destination, Age, Education and Occupation Profiles” and “Remittance Flows in Latin America and the Caribbean: Patterns and Determinants” both by Caglar Ozden.
to 40 percent of GDP, Mexico where official flows are estimated at more than US$10 billion, or Jamaica where annual remittances are about US$500 per person. Similarly, as discussed below, many countries in Central America and especially in the Caribbean also suffer from significant emigration of highly educated workers, what is usually referred as the brain drain.

On the other hand, there are elements that are specific to Latin America. For example, unlike Asian countries where migrants tend to spend a few years abroad and then return to their home countries, most migration from Latin America is permanent and a significant portion is undocumented. Also, regarding final destinations, most Latin American migrants (and in the case of Mexico, virtually all migrants) choose the US due to the geographic proximity, existence of social networks and relatively more accepting culture of migrants.

This chapter first reviews the patterns of migration of Latin American countries and to that end it relies on the censuses of the destination countries (mainly the US) which offer a detailed picture of the existing stock of migrants. It then explores the profile of migrants in terms of age, education, and performance in the labor market of the destination country. Finally, the chapter relates the observed characteristics of the stock of migrants to the observed official flows of remittances as discussed in Chapter 1.

We have to acknowledge that the picture presented in this chapter is undoubtedly biased because due to data limitations we do not take into account South to South migration flows, which in some cases can be important. For example, it is well known that a large number of Nicaraguans migrate towards Costa Rica. Household survey data for 2001 show that 59% of Nicaraguan international migrants go to Costa Rica (29% to the US). According to Bank’s Poverty Assessment for Costa Rica roughly 20,000 Nicaraguans migrated to Costa Rica each year in the late 1990s (although that number declined to about 9,000 per year in the 2000s). By 2005, it is estimated that the number of Nicaraguans in Costa Rica was around 300,000 persons, a significant amount taking into account a population of about 5 million for Nicaragua. Similarly, according to the 2001 Haitian household survey, 20% of Haitian international migrants go to the Dominican Republic. However, to the extent that one is willing to assume that most of Latin American migrants take as destination a developed OECD country, then the biases will be relatively small.

II. Latin American migrants abroad

How many Latin Americans live abroad? In principle, countries with a larger population living abroad – both in absolute and relative terms – would experience more economically significant remittance flows. Indeed, the World Bank Global Economic Prospects 2006 states that the stock of migrant workers is associated with higher worker remittances. Panels A and B of Figure 2.1 present the overall number of migrants from the region using two different definitions and destinations. Panel A presents migration to the US whereas Panel B focuses on migration to all OECD countries from the region. Finally, Panel C presents the ratio of the labor force abroad to the total native labor force of country of origin. In these panels, the countries have been grouped according to geographic region and economic similarity. First, we list Mexico, followed by the Central America countries, the Caribbean countries, Andean countries and finally the rest of South America.

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Figure 2.1. Latin American migrants.

Panel A. Total Latin American migrants in the US (thousands)

Panel B. Latin American migrants in the OECD labor force (thousands)

Panel C. Share of migrants abroad relative to home population, 2000

Source: Own calculations
Before proceeding, the reader should note that these graphs use a logarithmic scale so that Mexican migration does not visually overwhelm the other smaller countries. In fact, the differences between Mexico and the rest of the Latin American countries are very marked. Panel A indicates that, in 2000, there were close to 10 million Mexicans living in the US. That same year, according to the US Census figures, the number of Cubans (870 thousand) or Salvadorans (820 thousand) in the US (i.e. the countries with the second and third highest number of migrants, respectively), represented less than 10 percent of the Mexican figure. One common critique of the Census is that it undercounts undocumented migrants for a variety of reasons. Among these, the desire of the migrants to minimize their contact with the US government out of fear of deportation is considered the most serious one. However, the Census claims to have measures to correct for the problem and many studies confirm that the problem is no greater than 10 percent of the population in most cases.

In addition to Cuba and El Salvador, there are several other countries with a stock of migrants between half a million and one million in the US: Dominican Republic (680 thousand), Jamaica (550 thousand), and Colombia (510 thousand). In absolute terms, and apart from the small Caribbean Island of St. Kitts and Nevis, the country with lowest number of migrants in the US is Paraguay with less than 13 thousand. On the whole, the total number of Latin American migrants in the US increased from 8.6 million in 1990 to about 16 million in 2000 (an 86 percent increase). Even excluding Mexico, which clearly dominates the absolute figures, migration to the US from the other countries in the region increased by 63 percent from 4.2 million migrants in 1990 to 6.8 million in 2000.

Among the countries in the region, Honduras experienced the most rapid growth in terms of the number of migrants - from 112 thousand in 1990 to 281 thousand (i.e. a 150 percent increase) ten years later. It is followed by Brazil with a 120 percent increase from around 95 thousand migrants to about 210 thousand and Mexico which more than doubled its migrant population in the US. During this period, there were only two Latin American countries whose number of migrants in the US declined: Panama (from 121 thousand to 104 thousand) and Dominica (from 18 thousand to 17 thousand). In absolute terms, the largest increases in migrants in the U.S. between 1990 and 2000 were from Mexico (4.7 million) followed by El Salvador (343 thousand).

Panel B of Figure 2.1 presents the number of migrants from the region in the labor forces of all OECD countries. These data, which are based on the Docquier and Marfouk (2005) dataset on brain drain, excludes children and other migrants who are not in the labor force. It is worth noting that there is significant correlation with Panel A since the US is the main destination for the migrants from many of the countries. Yet, for many South American countries, Europe continues to be an important destination. In some cases, migrants to the US from South America tend to represent less than 50 percent of those countries’ migrants.

Panels A and B of Figure 2.1 hide an important issue. Even though there might be many migrants from a given country, say Mexico, migration can be relatively more important for countries with much smaller populations. In fact, the number of Mexican migrants in the US is
larger than the total population of several of the countries in the region. To address this bias, Panel C presents the ratio of migrants to the overall labor force in the home country.

Figure 2.2. Major destination of Latin American migrants

Panel A. 1990

Panel B. 2000

Source: Own calculations

The most striking feature of this panel is that there is significant level of migration from a number of small countries, especially in the Caribbean. For example, as of 2000 on average 30 percent of the labor force of many Caribbean Islands had migrated. An extreme case is that of Grenada, where close to 50 percent of the population had migrated. For the non Caribbean countries, migrants as a share of the origin country population would represent on average about

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10 percent (6 percent for South America). Thus even if Mexico and the Central American countries tend to top the ranking of migrants in absolute terms, the small Caribbean Islands clearly dominate the migration charts when we look at migration flows in relation to each country’s population.

To explore the destination choices of Latin American migrants in more detail, Figure 2.2 presents the share of migrants in the US, Europe, Australia + Canada, Japan and Mexico for 1990 (Panel A) and 2000 (Panel B) respectively. The US is clearly the main destination for the migrants from Mexico and Central America. In fact, Mexico is the second most important destination for migrants from Central America since it serves as the first stop on their way to the US. For the Caribbean countries, Europe (especially the United Kingdom) and other OECD countries (mainly Canada) are the main destinations after the US, accounting for 50 percent of the migrants for several countries.

Europe is a major destination for Andean and other South American countries, mainly due to colonial and ethnic links. An interesting example is the migration from Brazil to Japan where grandchildren of the ethnic Japanese who migrated at the turn of the century are now going back to Japan for employment. In short, the US is the destination for less than 50 percent of the migrants in South America and slightly above 50 percent for the Caribbean countries. Nevertheless, since the vast majority of migrants from Latin America and the Caribbean are from Mexico and Central America, over 90 percent end up in the U.S.

Among the European destinations of Latin American migrants, Figure 2.3 indicates that language seems to play an important role. This figure is restricted to the Caribbean and South American countries and it indicates that the Caribbean migrants’ preferred destination is the United Kingdom whereas that of the South Americans is Spain.

**Figure 2.3. Major European destination of Latin American migrants**

![Figure 2.3. Major European destination of Latin American migrants](image)

Source: Own calculations
III. Age profile of migration

When do Latin Americans usually migrate? One of the main differences between Latin American migrants and those from other countries is that the migration is permanent for a vast majority of the former. This implies that most migrants are young adults who want to start a new life, mostly in the US, and bring over their families once they have established themselves. The fact that Latin Americans tend to migrate when they are young is illustrated in Figure 2.4 which presents the age profile of migrants at the time of arrival according to the US Census 2000. This figure indicates that the majority of migrants are below age 30 at the time of their migration for every country in the region. For example, in the cases of Mexico and most of the Central American countries, around 40 percent of migrants arriving to the US are between the ages of 18 and 30, and another 40 percent are below 17. For other countries in the region, the share of migrants under age 30 is also about 70 percent, but they are equally divided between the 0-17 and 18-30 ranges.

Figure 2.4. Age profile at the time of arrival for Latin American migrants

![Age profile chart]


Figure 2.5 presents the current age distribution of migrants. As a result of migration at a very young age, the age profile of migrants who are currently in the US is also rather young, especially when compared to the native population or other migrant communities. Almost 50 percent of Mexican born migrants in the US are below age 30, with a majority between the ages of 18 and 30. These numbers do not include the US-born children of migrants since they receive automatic citizenship. Thus, the overall “Latin American community” in the US is likely to be even younger than presented below. This pattern is especially striking when compared to migrants from other regions. For example, only 12 percent of German-born migrants, 20 percent of Canadian-born migrants and 22 percent of Polish-born migrants are below the age of 30. Migrants from other developing countries are younger than European migrants but still older than Latin American migrants. For example, 25 percent of Chinese and 35 percent of Indian migrants are below 30.
Figure 2.5. Current Age Profile of Latin American migrants

The age profile has important implications for both the migrants and the United States. On one hand, it implies a steady source of new entry into the labor market where the pressures due to aging native population are beginning to be felt. This provides an added advantage to the US economy. Many other OECD countries are experiencing steady declines in their labor supplies, an element that has negative implications for long-term sustainability of many programs, especially related to social security and welfare. On the other hand, it means a large number of young people who need to be culturally and economically integrated which can restrain many government resources. The recent political debates in the US are likely a reflection of these challenges. The age profile of migrants has important implications for the remittance patterns as well. If the current migrants are generally older and have been in the US for a long time, they are less likely to send significant amounts of remittances to their native countries. On the other hand, young and employed migrants are likely to have closer links with family members back home that rely on their remittances. One key issue is whether the immediate family of the migrant has migrated with him/her to the US. If the migrant has arrived alone – which is more likely for unskilled migrants - he is more likely to send remittances. The linkages between remittances and the education levels of the migrants will be further explored in a later section of this chapter.

Finally, we should add that there are certain exceptions, such as Cuba, Belize, Panama, Barbados, which are relatively small and had a more extensive history of migration to the US. As a result, their migrants tend to be older. The extreme example is given by the migrants from Cuba to the U.S.: only 4 percent are younger than 17 and only 10 percent are between 18 and 30 years old. Second, we do not have comparable data for the European countries. However, there is no indication that the overall migration from South America to Europe is different than the migration flows to the US. Thus, at this point, it would be safe to assume that Latin American migrants in Europe present a similar age profile to their counterparts in the U.S.
IV. Education Profile

Another difference between migrants from Latin American and the rest of the world is the educational distribution. For a variety of reasons, the Latin American migrant population is distributed towards the bottom end of the education spectrum. The schooling levels of Latin American migrants are especially low for people who migrated as adults, after completing their education in their home countries. Figure 2.6 presents the education distribution of migrants to the US who arrived during the 1990s and who were above the age of 22 at the time of their arrival. Most migrants, especially those from Mexico and Central America, have very little education. Since they account for the majority of the migrants from Latin America, they dominate the overall education profile as well.

An important observation is that there are significant differences in the education distribution between different countries. Only 4 percent of Mexican migrants have tertiary education whereas the same ratio is 7 percent for Central America, 12 percent for the Caribbean, 24 percent for the Andean region and around 30 percent for other South American countries. If one were to expand the comparison to developing countries from other parts of the world, the gaps are even bigger. For example, around 70 percent of migrants from India, China, the Philippines, Egypt, Iran, Indonesia, Pakistan and Malaysia have tertiary education. Some of the reasons behind this divergence between developing countries are explained below.

Figure 2.6. Education profile of LAC migrants (age 22+) who arrived during the 1990s


Educational differences are also evident from Table 2.1, which reports the share of migrants with primary secondary and tertiary education for three groups: Mexico and Central America, the Caribbean, and South America. In fact, a majority of migrants in the first group of countries would have only primary education. In contrast, a majority of Caribbean migrants
would have secondary education. Finally, the most educated migrants are those from South America where more than three-quarters have secondary or tertiary education.

Table 2.1. Education profile of LAC migrants (% with a given educational level)

<table>
<thead>
<tr>
<th>Region</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico and Central America</td>
<td>51</td>
<td>37</td>
<td>12</td>
</tr>
<tr>
<td>Caribbean</td>
<td>34</td>
<td>53</td>
<td>13</td>
</tr>
<tr>
<td>South America</td>
<td>24</td>
<td>48</td>
<td>28</td>
</tr>
</tbody>
</table>

Source: Own calculations based on the 2000 US Census data

One of the key questions is what factors explain this divergence. One possibility is the overall education level in the underlying population in the home country. In Figure 2.7, the horizontal axis presents the tertiary school enrollment in the home country. This ratio ranges from 1.5 percent in Haiti to the 20 percent in many countries such as Costa Rica, Panama, Venezuela, and Argentina. The vertical axis is the ratio of tertiary educated among the migrants who are currently in the US.

Figure 2.7. Education profile of native population versus the Migrants for LAC countries

Figure 2.7 indicates that Mexico and most of the Central American countries are below the 45 degree line; that is, migrants are drawn from the lower end of the education spectrum in the home country. In contrast, the Caribbean and the South American countries are above the 45 degree line which means the migrants are proportionally more educated than those who remain behind. For example, even though education levels in Brazil and Mexico are similar, their migrants are starkly different in their education profiles. One possible explanation of this finding is that it is relatively easy for Mexican and Central Americans to migrate to the US whether...
through legal channels using family preferences or without proper documentation. On the other hand, it is more costly for a Brazilian to migrate. As a result, the educated form a higher portion of the migrants from South American countries since these are the people who can afford to migrate and they benefit more from migrating.

A related question in this context is the degree of brain drain: what portion of the countries’ most qualified and skilled workers migrates and what is the impact of their migration on home countries? Brain drain is one of the most debated and researched issues related to migration. There is large amount of evidence pointing out the importance of human capital in economic development. Many developing countries spend significant public resources on education, especially on tertiary education. When these highly-educated workers migrate, their home countries lose on many fronts. First, there is the loss of potential positive externalities generated by the educated workers – whether they are doctors, engineers, entrepreneurs or civil servants. Second, there is the loss of potential tax revenue on the incomes of these people. Third, there is the loss of public funds spent on their education. On the other hand, there are potential gains. Skilled migrants might earn significantly higher incomes in their destination countries and the remittances they send can be a significant source of income for their families. They also establish important cultural and economic links between their home countries and the global economy. For example, Anne Saxenian provides rather compelling evidence on the role played by the Silicon Valley-based Taiwanese and Indian engineers in the emergence of the computer industries in their home countries.

Figure 2.8. Share of college educated who have migrated

Source: Docquier and Marfouk (2005)

The brain drain debate centers more on the portion of the educated population which migrates, rather than on the portion of skilled workers within overall migration. An example might illustrate this point more clearly. Suppose 50 percent of a European country’s population has a college degree and 5 percent of these people migrate abroad and nobody else does. On the other hand, suppose 5 percent of an African country’s population has a college degree and half of
them migrate, along with 10 percent of the rest of the population. While 100 percent of the migrants from the European country will have a college degree, that fraction will be only 20 percent for the African country. Furthermore, even though European migrants will be more educated, brain drain will have a much more significant impact on the African country since it has lost a much larger portion of a very scarce economic input.

The work by Docquier and Marfouk (2005) was the first systematic effort to provide evidence on the extent of the migration of the highly educated people based on the censuses of the destination OECD countries. Figure 2.8 is based on their dataset and provides a very different picture to the one emerging from Figure 2.6, which showed that most educated migrants came from South America. In fact, many small and economically isolated countries in the region, especially island countries, appear to have lost a very significant portion of their college educated population to migration. Over 80 percent of people born in Haiti, Jamaica, Grenada, or Guyana who have college degrees live abroad, mostly in the US. On the other hand, less than 10 percent of the college graduates from South American countries have migrated even though they form a large portion of the migrant population. This is mainly due to the low levels of overall migration for South America. For Mexico and Central America, the migration level of the college graduates is around 15-20 percent which is relatively high in comparison to South America, but not as alarming as the situation found in the Caribbean.

**Figure 2.9. Share of college educated Workers who received their degrees at home.**

![Graph showing share of college educated workers who received their degrees at home](image)


It is important to note that the numbers cited so far include people who came to the U.S. or other OECD countries as children and completed their education there. This is an important distinction since, as shown previously, a large portion of the migrants from the region enter as children. Even though they are foreign-born and are considered migrants, it is debatable whether they would constitute brain drain since there is no guarantee they would receive the same level of education if they had not migrated. Moreover, even if some of the young migrants found in the OECD would have received college degrees had they stayed in their home countries, the fact that
they left does not imply a reduction in the overall level of education. It is quite likely that those migrants were replaced by other college graduates in their home countries.

Figure 2.9 presents the ratio of college educated migrants in the US who received their degrees in their home countries. Around 40 percent of college educated migrants from Mexico and Central America received their degrees at home – the other 60 percent finished their education in the US. The share of college graduates who completed their education in the US is lower for South Americans and much higher among Caribbean migrants. However, even if we exclude US-educated workers from the brain drain numbers, over 50 percent of the college educated people from the Caribbean who obtained their education in the home countries have migrated. This is still a very significant number when compared to all other developing countries.

**Figure 2.10. Share of Migrants with College Degrees According to Age of Entry.**

[Chart showing share of migrants with college degrees by age of entry for Mexico, Central America, Caribbean, Andean, and South America.]


Considering that a significant portion of the migrants from the region is very young, an important related question regards the link between migration and the incentives to obtain tertiary education in destination countries. Figure 2.10 presents the portion of migrants from each sub-region by the age of arrival to the U.S. and the portion who had received a college degree afterwards. The first pattern is that the percent of migrants who receive a college degree is inversely related to the age of arrival, regardless of the country of origin. The younger the age of arrival, the higher is the likelihood of receiving a college degree. For example, 6 percent of Central American migrants who arrived between the ages of 18-21 receive a college degree whereas the same ratio is 18 percent for those arriving before they turn 5. The second observation is that the likelihood of receiving a college degree is again increasing with distance from the US. South American migrants are likely to obtain a college degree in the US compared to Mexican or Central American migrants for all age groups. These observations are likely to be related to the social and economic status of migrants' parents: e.g. the fact that South American
adult migrants are more educated than their counterparts in Central America. This issue obviously needs more research as it is crucial for understanding the factors that drive the integration of migrants into the economy of destination countries.

V. Labor market performance

The previous sections dealt with the age and education profile of Latin American migrants. This section analyzes their performance in the labor market, which is the key determinant of their economic and social integration. Panel A of Figure 2.11 presents the occupational distribution for all working adults above age 22 in 2000, who were also above 22 when they arrived. In other words, these are the migrants who are less likely to continue their education in the US. Once again, there are stark differences between different countries. Slightly above 10 percent of Mexican and Central American migrants work in high-skilled and medium-skilled jobs whereas the same ratio is between 40 and 50 percent for Caribbean and South American migrants. Naturally this reflects the overall educational distribution of migrants that was analyzed above.

Figure 2.11. Occupational distribution of migrants

Panel A. Occupational Distribution of Migrants (current age 22+) who were above 22 at time of arrival.
Panel B. Occupational Distribution of Migrants (current age 22+) who were below 17 at time of arrival

The situation improves significantly for migrants who arrived as children. Panel B of Figure 2.11 presents the same data for people who arrived below age 17. We still see differences between Mexican and Central American migrants on one hand, and Caribbean and South American migrants on the other. Over 20 percent Mexican migrants and over 30 percent of Central American migrants are now in highly or medium skilled jobs, but that ratio is between 50 and 60 percent for migrants from the Caribbean and South America. The improvements with respect to the population of migrants that were aged 22 or older when entering the US are due to the higher education levels, English proficiency and other measures of social and economic integration exhibited by migrants that entered the country as children.

The figures above do not take into account the underlying educational distribution of migrants. South American migrants might be obtaining better jobs compared to Central American migrants since they are more educated. A more appropriate comparison is between migrants with the same education levels. Figure 2.12 presents the labor market placement of college educated migrants who were above 25 at the time of arrival. In other words, these are the people who definitely completed their education in their home countries and migrated to the US as adults for employment. We refer to this as “Brain Waste” since there is significant “underplacement” of migrants from certain countries in the US labor market. For example, only 33 percent of college educated migrants from Mexico end up in skilled jobs and another 23 percent are in medium-skilled jobs. In other words, 44 percent of them are in unskilled jobs and this is a relatively high number. The performance of Central American and the Andean migrants is similar to that of their Mexican counterparts. On the other hand, educated migrants from the Caribbean and South America perform significantly better, with in most cases less than 20 percent of college educated workers performing low skilled occupations, compared to more than 40 percent for migrants from several Central American and Caribbean countries. The gap with developing countries from other regions is even bigger. For example, 76 percent of tertiary educated Indian migrants end up in skilled jobs. The same ratio is 56 percent for Chinese and 58 percent for Egyptian migrants.
Mattoo, Neagu and Ozden (2005) also observe similar patterns for countries in other parts of the world. They explore the differences between outcomes such as those obtained for different subgroups of countries within Latin America. They point out two sets of answers, with the first being related to the underlying quality of education in the migrants' home countries. Thus, one could argue that since South American and Caribbean countries spend more on education, their migrants' human capital is likely to be of a higher quality. Still, this does not explain the large differences observed with Central America and the Caribbean, and especially the impressive performance of migrants from Asian countries. An alternative explanation involves positive selection among migrants with tertiary education from South American and Caribbean countries. The hypothesis is that the migrants are among the best of the educated in their countries. On the other hand, Mexican and Central American college graduate migrants seem to be coming from the lower end of the quality distribution of all college graduates of the corresponding home countries. Once again, the different mechanisms of selection into migration would be related to the relative ease of migration that was mentioned earlier for the cases of Mexico and Central America. Moreover, for South American migrants the main method of entry seems to be through employment preferences which require the migrant to secure a job in the US. This naturally favors more qualified migrants. On the other hand, Mexican and Central American migrants can more easily enter through family preferences or illegally. As a result, the overall quality of South American migrants seems to be higher even when compared to others who also have college degrees.

**Figure 2.12. Brain waste: Home tertiary educated migrants 25+ on arrival**


**VI. Migration and Remittances.**

In the previous sections we have explored the characteristics of Latin American migrants. The question that we address now is whether these characteristics can be used to explain the
remittances patterns described in Chapter 1. Previous efforts that have aimed at explaining the determinants of remittances include those contained in the World Bank’s 2006 Global Economic Prospects where it is found that remittances tend to increase with the stock of migrants a country has abroad, decline with the service fee that migrants are charged for the transaction and with the existence of dual exchange rates, and increase with the level of financial development and per capita income level in the home country.

Which migrant characteristics explain remittance patterns? It is not hard to argue that migrant population is probably one of the most important determinants of remittances, although different ways of measuring the population of migrants will affect different measures of remittances. For example, it is not unreasonable to assume that the total population abroad will be correlated with the overall volume of remittances. In contrast, the share of migrants abroad relative to the home population will be more related to remittances on a per capita basis.\(^8\)

Figure 2.13 presents the average level of migration as a share of the home population from three Latin American sub-regions to the US over the 1980-2000 period. According to this figure, the Caribbean is the sub-region that has the largest level of emigration to the US: as of 2000, it is estimated that 15 percent of the population of the region had migrated abroad up from less than 10 percent in 1980. The same number is slightly above 8 percent for Central America/Mexico (4 percent in 1980) and around 1 percent for South America in the same year (.5 percent in 1980).

---

\(^8\) If all migrants remitted the same amount, then total migration would be an exact multiple of total remittances; similarly, the number of migrants relative to the home population would be an exact multiple of remittances per capita.
A second characteristic to take into account is the income level of the migrants. If there is a tendency for migrants from one country to earn significantly higher levels of income than those of another country, then it is likely that the former send more remittances back to their families at home. Thus the income levels of the migrants as well as other characteristics will influence remittance behavior. Among such characteristics are the level of female migration and the ratio of college educated individuals among migrants.

On female migration levels, one could infer that they can have a negative correlation with remittances for two reasons. First, female labor force participation is generally lower and it is even lower in migrant communities. Second, higher female migration levels are likely to indicate that whole families have migrated and there are fewer family members at home who are relying on the remittances. Figure 2.14 presents the evolution over 1980-2000 of the portion of female migrants from the three different Latin American sub-regions considered in Figure 2.12. Once again the Caribbean region has the highest ratio of females. It would now be followed by South America, and finally by Central America and Mexico which have the lowest ratio of female migrants— at 46% as of 2000. Thus this could be interpreted as Central America and Mexico having a majority of migrants that are young males who in turn have the highest likelihood of sending remittances.

**Figure 2.14. Share of Female Migrants**

<table>
<thead>
<tr>
<th>Year</th>
<th>South America</th>
<th>Central America</th>
<th>Mexico</th>
<th>Caribbean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>58</td>
<td>56</td>
<td>54</td>
<td>52</td>
</tr>
<tr>
<td>1992</td>
<td>56</td>
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<tr>
<td>1993</td>
<td>54</td>
<td>52</td>
<td>50</td>
<td>48</td>
</tr>
<tr>
<td>1994</td>
<td>52</td>
<td>50</td>
<td>48</td>
<td>46</td>
</tr>
<tr>
<td>1995</td>
<td>50</td>
<td>48</td>
<td>46</td>
<td>44</td>
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<tr>
<td>1996</td>
<td>48</td>
<td>46</td>
<td>44</td>
<td>42</td>
</tr>
<tr>
<td>1997</td>
<td>46</td>
<td>44</td>
<td>42</td>
<td>40</td>
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<tr>
<td>1998</td>
<td>44</td>
<td>42</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>1999</td>
<td>42</td>
<td>40</td>
<td>38</td>
<td>36</td>
</tr>
<tr>
<td>2000</td>
<td>40</td>
<td>38</td>
<td>36</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: Own calculations

Another important variable is the portion of the highly educated among the migrants. This issue was explored in detail earlier in this chapter and it is an important link in the migration-remittances-development chain. We have shown that Central American/Mexican migrants have much lower levels of education than the rest of migrants from Latin America.

Figure 2.15 presents the evolution of the ratio of college graduates among the migrants from each sub-region to the US over time. In principle, a high ratio of tertiary education implies
a higher level of income and therefore a higher level of remittances. However, there are countervailing forces. First, college educated migrants are more likely to come from middle and upper class families which would rely less on the remittances income. Second, it is much easier for educated migrants to obtain legal residency in the destination country and bring their families with them. This would also decrease the incentives to remit money back home. In fact, it is possible that once we control for the income level of the migrants, education is negatively related to the remittances sent.

**Figure 2.15. Share of College Graduates among Migrants**

![Graph showing the share of college graduates among migrants from 1991 to 2000 for different regions.](source)

Source: Own calculations

**Figure 2.16. Bank Deposits as a Share of GDP**

![Graph showing the share of bank deposits as a share of GDP from 1980 to 2000 for different regions.](source)
Chapter 5 below argues that remittances may have positive effects on financial development of the recipient countries and provides new evidence on the subject. However, the reverse is likely to be true as well: migrants would be more likely to send money back home if the financial sector was more developed and efficient. Furthermore, financial development is likely to increase the portion of remittances flowing through formal channels which are, in return, more likely to be accurately captured in official remittance statistics. Figure 2.16 presents the Bank Deposit/GDP ratio for the three sub-regions of LAC and indicates that the Caribbean is the more financially developed sub-region, which can partially explain the higher level of remittances. Another frequently used measure of financial development is the ratio of Credit to GDP, which we as a proxy use in the empirical section.

The final set of variables employed in our analysis influences remittance flows through the macroeconomic conditions of recipient countries. The first one is per capita GDP. The motivation for including this variable is that if income levels are low in a country, migrants might be more likely to remit money to their families. The second variable is economic growth. If the investment climate is favorable and a country is growing rapidly, migrants might be more likely to remit for investment purposes. The corresponding flows may be destined to real estate investments, which are highly favored by migrants in many countries, physical capital investments, such as businesses and capital goods, or human capital investments, such as the education of their children. Third is size of the country. There is much evidence that argues that smaller and isolated small economies can not sustain many economic activities which induces their citizens to migrate. Thus, smaller countries – controlling for the above two factors – are likely to attract lower levels of investment.

**Empirical strategy**

The goal of this section is to identify which of the above listed variables are significant determinants of remittance flows for the Latin American countries. The first step is to estimate the following equations for three different measures of remittances.

1. \[
\text{Remittances/GDP}_i = \alpha + \beta_1 \frac{\text{Migrants}}{\text{Population}}_i + \beta_2 \frac{\text{BankDeposit/GDP}}{\text{GDP}}_i + \beta_3 \frac{\text{FemaleMigrantRatio}}{\text{CollegeEducatedRatio}}_i + \beta_4 \frac{\text{MigrantIncome}}{\text{GDPGrowth}}_i + \beta_5 \frac{\text{Log GDP/Capita}}{\text{Log GDP}}_i + \varepsilon_i
\]

2. \[
\text{Log Remittances/capita}_i = \alpha + \beta_1 \text{Log MigrantsAbroad}_i + \beta_2 \text{BankDeposit/GDP}_i + \beta_3 \text{FemaleMigrantRatio}_i + \beta_4 \text{CollegeEducatedRatio}_i + \beta_5 \text{Log MigrantIncome}_i + \beta_6 \text{GDPGrowth}_i + \beta_7 \text{Log GDP/Capita}_i + \beta_8 \text{Log GDP}_i + \varepsilon_i
\]

3. \[
\text{Log Remittances/migrant}_i = \alpha + \beta_1 \text{Log MigrantsAbroad}_i + \beta_2 \text{BankDeposit/GDP}_i + \beta_3 \text{FemaleMigrantRatio}_i + \beta_4 \text{CollegeEducatedRatio}_i + \beta_5 \text{Log MigrantIncome}_i + \beta_6 \text{GDPGrowth}_i
\]
where \(i\) and \(t\) are a country and time subscript respectively.

Each equation is first estimated using OLS with robust standard errors and the log of the native populations as weights in order to avoid attaching too much weight to smaller or larger countries in the sample. Then we estimate the same equations using both country and year fixed effects to isolate time invariant country specific conditions – such as distance to the U.S. – and period-specific effects that have the same effect in all countries – such as for example the business cycles in the US.

One of the crucial issues in the migration literature is that migrants are not a random sample of the underlying native population of the source country. In some cases, they are more educated than their fellow citizens, which is the case with the Asian and Middle Eastern migrants in the US as well South American migrants as identified above. In other cases, they come from rural areas or are from a certain region. In the Latin American migration context, a large portion of the migrants, especially from Central America and Mexico, are relatively unskilled migrants who plan to send home significant amount of remittances. In other words, while the level of migration affects remittance levels, the desire to remit also influences migration levels. This endogeneity bias needs to be controlled in our estimation via instrumental variables. Thus, we add a first stage estimation to each equation listed above where we use several instruments for the migration variables. These are the cost of obtaining a passport, the ratio of urban population and the population density in each country.

Empirical Results

Tables 2.2 to 2.4 report the results of estimating equations (1) to (3), respectively. The first two columns correspond to OLS estimation, the third and fourth to fixed effects, and the last two to instrumental variables estimation. The main messages are as follows:

- **Migration levels increase remittance/GDP levels and decreases remittances sent per migrant. The impact on remittances received per capita is ambiguous.** As expected migration levels are positively correlated with remittance levels when remittances are measured as the remittance/GDP ratio. On the other hand, an increase in the number of migrants decreases remittances sent by each migrants. This is likely to be due family reunification effect – as more people migrate the aggregate amount sent is divided among more senders.

- **Increases in the overall education levels of migrants tend to reduce remittances sent.** This finding confirms the prediction that once we control for migrants’ incomes, higher education levels are associated with lower remittances. Note however, that the effect loses some degree of significance in the IV estimation even though the coefficients are still negative. This is likely to be due to the interaction between this variable and the instruments.
- **Economic growth in the recipient country tends to increase remittance levels.** Higher economic growth is a sign of stability and more abundant investment opportunities. This is likely to encourage migrants to send remittances for investment purposes.

- **Financial development variables have a significant and positive effect on remittances.** In the OLS and fixed effects estimations, financial development variables, Deposits/GDP and Credit/GDP, have ambiguous signs. However, in the IV estimation, they have positive and generally significant coefficients indicating that financially more developed countries attract higher levels of remittances. This is complementary to the findings on the positive effects of remittances on financial development that are explored in detail in later chapters.

- **The share of female migrants does not have a significant effect on remittance flows.** In the cases of remittances per capita and per migrant, the coefficients on this variable are negative as predicted but they are non-significant in most cases. In the case of remittances as a ratio of GDP, the share of female migrants has a positive coefficient but again is not significant in most specifications.

- **Income per capita and size of the economy influence remittance flows.** Overall economic prosperity is likely to be among the most important determinants of remittance flows. These variables, log GDP/capita and log GDP have highly significant coefficients, especially in the IV estimates. GDP/capita and total GDP respectively reduce and increase remittances flows, both as a share of GDP and on a per migrant basis. On the other hand, the impact on remittances received per capita is not statistically different than zero.
Table 2.2. Determinants of Remittances (as a share of GDP)

<table>
<thead>
<tr>
<th>Variable</th>
<th>OLS</th>
<th></th>
<th>Fixed effects</th>
<th></th>
<th></th>
<th>IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td></td>
</tr>
<tr>
<td>Migrants abroad/population</td>
<td>0.179</td>
<td>0.18</td>
<td>0.139</td>
<td>0.129</td>
<td>1.124</td>
<td>0.941</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>5.26</td>
<td>5.29</td>
<td>1.78</td>
<td>1.63</td>
<td>1.42</td>
<td>1.95</td>
<td></td>
</tr>
<tr>
<td>Bank deposit/GDP</td>
<td>0.499</td>
<td>0.97</td>
<td>6.356</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>0.38</td>
<td>0.48</td>
<td>1.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank credit/GDP</td>
<td></td>
<td></td>
<td></td>
<td>1.541</td>
<td>-1.596</td>
<td>0.716</td>
<td></td>
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<tr>
<td>t-stat</td>
<td></td>
<td></td>
<td></td>
<td>1.20</td>
<td>-0.82</td>
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<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>1.83</td>
<td>1.63</td>
<td>0.77</td>
<td>1.00</td>
<td>0.68</td>
<td>0.40</td>
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</tr>
<tr>
<td>t-stat</td>
<td>-5.31</td>
<td>-5.53</td>
<td>-3.33</td>
<td>-3.66</td>
<td>-0.33</td>
<td>-0.48</td>
<td></td>
</tr>
<tr>
<td>Lg of average income of migrants</td>
<td>0.359</td>
<td>0.326</td>
<td>-0.737</td>
<td>-0.808</td>
<td>-1.788</td>
<td>-2.108</td>
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<tr>
<td>t-stat</td>
<td>1.72</td>
<td>1.56</td>
<td>-1.07</td>
<td>-1.15</td>
<td>-0.72</td>
<td>-0.96</td>
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</tr>
<tr>
<td>GDP growth</td>
<td>0.04</td>
<td>0.039</td>
<td>0.066</td>
<td>0.057</td>
<td>0.004</td>
<td>0.005</td>
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</tr>
<tr>
<td>t-stat</td>
<td>0.93</td>
<td>0.91</td>
<td>2.54</td>
<td>2.04</td>
<td>0.12</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Lg of GDP per capita</td>
<td>-1.174</td>
<td>-1.284</td>
<td>-20.819</td>
<td>-20.6</td>
<td>-50.145</td>
<td>-46.142</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-2.59</td>
<td>-2.81</td>
<td>-4.46</td>
<td>-4.31</td>
<td>-2.52</td>
<td>-2.45</td>
<td></td>
</tr>
<tr>
<td>Lg of GDP</td>
<td>0.072</td>
<td>0.122</td>
<td>14.212</td>
<td>14.47</td>
<td>45.449</td>
<td>41.383</td>
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<tr>
<td>t-stat</td>
<td>0.45</td>
<td>0.78</td>
<td>2.97</td>
<td>2.94</td>
<td>2.14</td>
<td>2.04</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
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<td>-206.527</td>
<td>-215.062</td>
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<td>t-stat</td>
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<td>0.76</td>
<td>-2.03</td>
<td>-2.07</td>
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</tbody>
</table>

Observations: 270 270 270 270 226 226
R2: 0.459 0.462 0.891 0.891 0.149 0.427
F-statistic (p-value): 0 0 0 0 0.6 0.76

Note: The table reports the results of regressing the ratio of Remittances to GDP on the variables in the first column. IV estimation uses as instrument for remittances passport costs, the ratio of urban population and the population density in each country. Source: Own calculations.
## Table 2.3. Determinants of Remittances (per capita)

<table>
<thead>
<tr>
<th>Variable</th>
<th>OLS (1)</th>
<th>OLS (2)</th>
<th>Fixed effects (3)</th>
<th>Fixed effects (4)</th>
<th>IV (5)</th>
<th>IV (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>migrants abroad/population</td>
<td>0.516</td>
<td>0.484</td>
<td>0.05</td>
<td>-0.052</td>
<td>1.734</td>
<td>2.27</td>
</tr>
<tr>
<td>t-stat</td>
<td>6.04</td>
<td>5.90</td>
<td>0.10</td>
<td>-0.10</td>
<td>4.20</td>
<td>2.88</td>
</tr>
<tr>
<td>Bank deposit/GDP</td>
<td>-1.411</td>
<td>1.278</td>
<td>2.293</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-2.21</td>
<td></td>
<td>1.37</td>
<td></td>
<td>2.29</td>
<td></td>
</tr>
<tr>
<td>Bank credit/GDP</td>
<td>-0.894</td>
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<td>-0.047</td>
<td></td>
<td>1.398</td>
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<tr>
<td>t-stat</td>
<td>-1.36</td>
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<td>-0.05</td>
<td></td>
<td>1.33</td>
<td></td>
</tr>
<tr>
<td>Share of female migrants</td>
<td>-1.214</td>
<td>-0.872</td>
<td>-7.747</td>
<td>-6.607</td>
<td>-3.57</td>
<td>-0.991</td>
</tr>
<tr>
<td>t-stat</td>
<td>-0.54</td>
<td>-0.39</td>
<td>-1.87</td>
<td>-1.57</td>
<td>-0.64</td>
<td>-0.16</td>
</tr>
<tr>
<td>t-stat</td>
<td>-4.10</td>
<td>-4.60</td>
<td>-1.53</td>
<td>-1.65</td>
<td>-1.14</td>
<td>-0.72</td>
</tr>
<tr>
<td>Lg of average income of migrants</td>
<td>0.516</td>
<td>0.484</td>
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<td>-0.142</td>
<td>-0.635</td>
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<td>-0.47</td>
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<tr>
<td>GDP growth</td>
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<td>-0.009</td>
<td>0.0167</td>
<td>0.013</td>
<td>0.013</td>
<td>0.015</td>
</tr>
<tr>
<td>t-stat</td>
<td>-0.57</td>
<td>-0.60</td>
<td>1.86</td>
<td>1.44</td>
<td>1.08</td>
<td>1.36</td>
</tr>
<tr>
<td>Lg of GDP per capita</td>
<td>1.298</td>
<td>1.265</td>
<td>-3.651</td>
<td>-3.886</td>
<td>-2.386</td>
<td>-2.392</td>
</tr>
<tr>
<td>t-stat</td>
<td>11.39</td>
<td>10.91</td>
<td>-2.46</td>
<td>-2.57</td>
<td>-1.10</td>
<td>-0.95</td>
</tr>
<tr>
<td>Lg of GDP</td>
<td>-0.743</td>
<td>-0.679</td>
<td>3.259</td>
<td>3.694</td>
<td>2.82</td>
<td>2.795</td>
</tr>
<tr>
<td>t-stat</td>
<td>-8.54</td>
<td>-8.28</td>
<td>2.12</td>
<td>2.35</td>
<td>1.32</td>
<td>1.28</td>
</tr>
<tr>
<td>Constant</td>
<td>5.363</td>
<td>4.638</td>
<td>-43.573</td>
<td>-51.385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>2.47</td>
<td>2.10</td>
<td>-1.57</td>
<td>-1.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Observations                                  | 270     | 270     | 270               | 270               | 226    | 226    |
| R2                                            | 0.579   | 0.575   | 0.913             | 0.911             | 0.366  | 0.318  |
| F-statistic (p-value)                         | 0       | 0       | 0                 | 0                 | 0.17   | 0.12   |

Note. The table reports the results of regressing the log of remittances per capita on the variables in the first column. IV estimation uses as instrument for remittances passport costs, the ratio of urban population and the population density in each country. Source: Own calculations
<table>
<thead>
<tr>
<th>Variable</th>
<th>OLS (1)</th>
<th>OLS (2)</th>
<th>Fixed effects (3)</th>
<th>Fixed effects (4)</th>
<th>IV (5)</th>
<th>IV (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>migrants abroad/population</td>
<td>-0.483</td>
<td>-0.516</td>
<td>-0.949</td>
<td>-1.052</td>
<td>-1.483</td>
<td>-2.248</td>
</tr>
<tr>
<td>t-stat</td>
<td>-5.68</td>
<td>-6.29</td>
<td>-1.87</td>
<td>-2.00</td>
<td>-1.85</td>
<td>-2.75</td>
</tr>
<tr>
<td>Bank deposit/GDP</td>
<td>-1.411</td>
<td></td>
<td>1.278</td>
<td>3.742</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-2.21</td>
<td></td>
<td>1.37</td>
<td>3.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank credit/GDP</td>
<td>-0.894</td>
<td></td>
<td>-0.046</td>
<td>2.814</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-1.36</td>
<td></td>
<td>-0.05</td>
<td>2.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-0.54</td>
<td>-0.39</td>
<td>-1.87</td>
<td>-1.57</td>
<td>-1.29</td>
<td>-1.24</td>
</tr>
<tr>
<td>t-stat</td>
<td>-4.10</td>
<td>-4.60</td>
<td>-1.53</td>
<td>-1.65</td>
<td>-1.82</td>
<td>-0.92</td>
</tr>
<tr>
<td>Lg of average income of migrants</td>
<td>0.516</td>
<td>0.484</td>
<td>-0.111</td>
<td>-0.142</td>
<td>0.265</td>
<td>0.442</td>
</tr>
<tr>
<td>t-stat</td>
<td>3.04</td>
<td>3.36</td>
<td>-0.37</td>
<td>-0.47</td>
<td>0.39</td>
<td>0.57</td>
</tr>
<tr>
<td>GDP growth</td>
<td>-0.008</td>
<td>-0.009</td>
<td>0.016</td>
<td>0.013</td>
<td>0.032</td>
<td>0.044</td>
</tr>
<tr>
<td>t-stat</td>
<td>-0.57</td>
<td>-0.60</td>
<td>1.78</td>
<td>1.44</td>
<td>2.46</td>
<td>3.67</td>
</tr>
<tr>
<td>Lg of GDP per capita</td>
<td>0.298</td>
<td>0.265</td>
<td>-4.651</td>
<td>-4.886</td>
<td>-14.245</td>
<td>-12.214</td>
</tr>
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<td>t-stat</td>
<td>2.61</td>
<td>2.30</td>
<td>-3.13</td>
<td>-3.23</td>
<td>-4.20</td>
<td>-3.34</td>
</tr>
<tr>
<td>Lg of GDP</td>
<td>0.257</td>
<td>0.32</td>
<td>4.259</td>
<td>4.694</td>
<td>12.226</td>
<td>9.709</td>
</tr>
<tr>
<td>t-stat</td>
<td>2.95</td>
<td>3.95</td>
<td>2.78</td>
<td>2.98</td>
<td>3.26</td>
<td>2.42</td>
</tr>
<tr>
<td>Constant</td>
<td>5.363</td>
<td>4.638</td>
<td>-43.573</td>
<td>-51.385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>2.47</td>
<td>2.10</td>
<td>-1.57</td>
<td>-1.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Observations                                 | 270     | 270     | 270               | 270               | 225    | 225    |
| R2                                           | 0.326   | 0.319   | 0.859             | 0.858             | 0.436  | 0.417  |
| F-statistic (p-value)                         | 0       | 0       | 0                 | 0                 | 0.03   | 0      |

Note. The table reports the results of regressing the log of remittances per migrant on the variables in the first column. IV estimation uses as instrument for remittances passport costs, the ratio of urban population and the population density in each country. Source: Own calculations
VII. Conclusions

This chapter has reviewed the overall migration patterns from Latin American and the Caribbean countries, especially in terms of the destinations chosen, age and education profiles of migrants and their labor market performance in the US. Even though most analysts categorize migrants from the region as a homogenous group, we find that there are important differences across countries and sub-regions. Mexican and Central American migrants dominate overall migration flows in terms of numbers. They are also much younger, less educated and tend to migrate primarily to the US. South American migrants are older, more educated and a large portion favors Europe due to ethnic and cultural linkages. While South American migrants are much more educated than the rest, brain drain is a more serious problem for other countries, especially smaller ones that do not provide many labor market opportunities for skilled workers. On the other hand, a large portion of the highly educated migrants from the region complete their education in the US. Given that they might not have received the same education if they have stayed at home, migration provides them and their home countries with higher economic potential. We also observe significant "brain waste" — many college educated migrants from the region end up in unskilled jobs that are not commensurate with their education levels.

The patterns outlined in the chapter were aimed at providing an overview of general migration trends, not definite answers, in order to contextualize the following chapters, which are preoccupied mainly with remittances and their impact on home countries. The questions that were posed need to be explored in further detail if the goal is to design policies and institutions that lead to win-win-win outcomes for the migrants themselves, and for destination and home countries.

As for the results of relating the characteristics of migrants to observed remittance flows, the main findings of this chapter are the following: (i) Migration levels increase remittance/GDP levels and decrease remittances sent per migrant. The impact on remittances received per capita is ambiguous. (ii) Increases in the overall education levels of migrants reduce the level of remittances sent. (iii) Economic growth in the recipient country increases remittance levels. (iv) Financial development variables have a significant effect on remittances: other things equal, countries with more developed financial sectors receive more remittances. (v) The share of female migrants does not have a significant effect on remittance flows. And (vi) income per capita and size of the economy influence remittance flows, with larger and poorer economies receiving more remittances.
Chapter 3

Remittances and Poverty Reduction

To the extent that remittances increase per capita income, ease credit constraints and compensate for negative shocks to recipient countries, they are likely to help reduce poverty and inequality, as well as boost domestic investment and economic growth. However, remittances also tend to be associated with a reduction in the income generating capacity of households with migrants. Moreover, they may reduce labor supply and lead to real exchange rate appreciations, all of which could potentially increase income volatility. The question thus remains as to whether remittances do in fact improve social outcomes and bolster economic growth and investment. Are all the above potential impacts of remittances economically relevant? Do the positive and negative effects of remittances compensate each other? What is the net effect of remittances on poverty and growth?

I. Introduction

Have the large remittances flows received by Latin America contributed to reduce poverty in the region? In principle, given that in many cases remittances go to poor households and directly increase their level of income, an unequivocal positive answer could be expected. Moreover, to the extent that remittances ease credit constraints and reduce risk and volatility, they could also promote higher levels of investment in physical and human capital, and have dynamic effects on growth and poverty reduction.

There are, however, several reasons that warrant circumspection in the assessment of the development impact of remittances. First, as shown in the previous chapter the position of migrants in the distribution of income and education varies considerably across sender countries. As a result, the impact of remittances on poverty reduction should also be expected to vary by country and region. Second, according to the New Open Economy Macroeconomics, if remittances lead to increases in a country’s domestic wealth, they could reduce labor supply, increase the demand for non-tradable goods and generate real exchange rate appreciations which,

* This chapter is based on the background papers for this report “Remittances and Development in Latin America” and “What is the Impact of International Remittances on Poverty and Inequality in Latin America?” by Pablo Acosta, Cesar Calderon, Pablo Fajnzylber, and Humberto Lopez, and the papers “Remittances, Growth, and Policy Complementarities,” and “Remittances and Growth Volatility: an Investigation into the Business Cycle Properties of Workers’ Remittances,” by Cesar Calderon, Pablo Fajnzylber, and Humberto Lopez.
in turn, could hurt competitiveness and growth. Third, to the extent that remittances are just one among other consequences of migration, they cannot be treated as exogenous transfers. Rather, it is reasonable to believe that in many cases remittances and migration also entail potential losses of income, associated with the migrants’ absence from their families and communities. Moreover, depending on the demographic characteristics of migrants, “brain drain” effects could have negative effects on productivity and welfare.

In this chapter we explore both the static and dynamic effects of remittances on development using micro and macroeconomic data and techniques. In particular, we investigate the links between remittances, poverty and inequality using household surveys and cross-country regression analyses. We then analyze the macroeconomic effects of remittances in more detail, considering not only their impact on economic growth, but also that on volatility and investment.

II. Remittances, Inequality and Poverty: a Microeconomic approach

As argued in the seminal paper by Stark et al. (1986), the impact of migration and international remittances on income inequality depends on the magnitude of remittances in relation to income from other sources and upon the position of remittance-receiving households in the distribution of income. In their perspective, when migration is incipient, its costs and related uncertainty are likely to be high, so that migrants can be expected to come from among the better off. As a result, at this point remittances would tend to have an un-equalizing effect. Over time, however, the uncertainty and costs involving migration are likely to diminish with the spread of information and contacts across a wider range of households, which may lead to increases in migration among the worse off, with potentially favorable effects on poverty and income inequality.

The simplest way of analyzing whether remittances increase or decrease income inequality is by comparing estimates of the Gini coefficient obtained respectively with observed non-remittances household income and total income. As shown in table 3.1, with the exception of Nicaragua and Peru, the other 9 Latin American countries for which data on remittances is available exhibit higher Gini coefficients for non-remittances income, suggesting that if remittances were exogenously eliminated inequality would increase. Quantitatively, however, the estimated potential changes in the Gini coefficient are small.

One of the factors that could explain the small inequality reducing effect of remittances is the fact that their own distribution is generally very unequal and that in several countries remittances tend to go to relatively well off households. This is illustrated in table 3.2, which reports the results of a complementary simulation involving the effect on the Gini coefficient of marginal increases in remittances income – as opposed to assuming that remittances are eliminated altogether.

The calculations are based on Stark et al.’s (1986) decomposition of the Gini coefficient for total income, as a function of inequality in remittances and non-remittances income, the share of each income source in total income, and the extent to which remittances and other sources of
income are correlated with total income. More specifically, the Gini coefficient of total income $G_T$ can be expressed as:

$$G_T = \sum_{k=1}^{K} R_k G_k S_k$$

(1)

where $k$ is an index for the different components of household income (i.e., non-remittances and remittances income), $R_k$ is the Gini correlation of component $k$ with total income, $G_k$ is the Gini coefficient of component $k$, and $S_k$ is the share of income source $k$ in total income. In this context, Stark et al. (1986) show that the effect of a small percentage change in one source of income — e.g. remittances — on the Gini coefficient of total income can be calculated as follows:

$$\frac{\partial G_T}{G_T} = \frac{S_k G_k R_k}{G_T} - S_k$$

(2)

### Table 3.1. Income Gini Coefficient before and after remittances

<table>
<thead>
<tr>
<th>Country</th>
<th>Gini Coefficient</th>
<th>Difference in Gini before/after remitt.</th>
<th>Diff. in %</th>
<th>Country</th>
<th>Gini Coefficient</th>
<th>Difference in Gini before/after remitt.</th>
<th>Diff. in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia (2002)</td>
<td>Non-Remittances Income 0.557</td>
<td>0.555</td>
<td>-0.002</td>
<td>-0.4%</td>
<td>Total Income 0.555</td>
<td>0.559</td>
<td>-0.013</td>
</tr>
<tr>
<td></td>
<td>Ecuador (2004)</td>
<td>Non-Remittances Income 0.505</td>
<td>0.499</td>
<td>-0.006</td>
<td>-1.2%</td>
<td>Total Income 0.505</td>
<td>0.481</td>
</tr>
<tr>
<td></td>
<td>El Salvador (2000)</td>
<td>Non-Remittances Income 0.514</td>
<td>0.486</td>
<td>-0.028</td>
<td>-5.4%</td>
<td>Total Income 0.514</td>
<td>0.518</td>
</tr>
<tr>
<td></td>
<td>Guatemala (2000)</td>
<td>Non-Remittances Income 0.596</td>
<td>0.586</td>
<td>-0.010</td>
<td>-1.8%</td>
<td>Total Income 0.596</td>
<td>0.516</td>
</tr>
<tr>
<td></td>
<td>Haiti (2001)</td>
<td>Non-Remittances Income 0.670</td>
<td>0.669</td>
<td>-0.001</td>
<td>-0.1%</td>
<td>Total Income 0.670</td>
<td>0.476</td>
</tr>
<tr>
<td>Dominica Republic (2004)</td>
<td>Non-Remittances Income 0.531</td>
<td>0.520</td>
<td>-0.011</td>
<td>-2.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Acosta et al. (2006).*

As reported in table 3.2, the Gini coefficient for remittances is above 0.9 in all 11 countries. In some of them, however, the high inequality in the distribution of remittances is partially compensated by a low Gini correlation between remittances and total income, which implies that in those cases remittances are often received by low income households. This is the case of Mexico, where the Gini correlation of remittances with total income is 0.289, El Salvador (0.303), Paraguay (0.437) and Guatemala (0.541). Not surprisingly, we find that in these four countries a marginal increase in remittances has an equalizing albeit small effect on income.

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9 This is the approach adopted by Taylor (1992), Barham and Boucher (1998), Adams (2004), Taylor et al. (2005) and Acosta et al. (2006).
inequality. In particular, it is estimated that a 10 percent increase in remittances would lead to an average reduction of 0.1 percent in the Gini of total income in those four countries. In contrast, in the other seven countries, where the households that receive remittances are also located in the upper deciles of the income distribution – e.g. Haiti, Nicaragua, the Dominican Republic and Peru – a marginal increase in remittances is associated with an increase in total income inequality: the Gini increases by 0.2 percent on average for each 10 percent increase in remittances income.

Table 3.2. Effect on the Gini of a 10% Increase in Remittances

<table>
<thead>
<tr>
<th>Country</th>
<th>Share in Total Income</th>
<th>Gini Coefficient</th>
<th>Gini correlation with Total Income</th>
<th>Effect of 10% increase in remitt. on Gini</th>
<th>Country</th>
<th>Share in Total Income</th>
<th>Gini Coefficient</th>
<th>Gini correlation with Total Income</th>
<th>Effect of 10% increase in remitt. on Gini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Remittances</td>
<td>0.985</td>
<td>0.557</td>
<td>0.991</td>
<td>0.04</td>
<td>Non-Remittances</td>
<td>0.933</td>
<td>0.572</td>
<td>0.971</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.015</td>
<td>0.990</td>
<td>0.728</td>
<td>0.04</td>
<td>Remittances</td>
<td>0.067</td>
<td>0.954</td>
<td>0.634</td>
<td>0.06</td>
</tr>
<tr>
<td>Total Income</td>
<td>1.000</td>
<td>0.555</td>
<td>1.000</td>
<td></td>
<td>Total Income</td>
<td>1.000</td>
<td>0.559</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Mexico (2002)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>0.964</td>
<td>0.505</td>
<td>0.980</td>
<td></td>
<td>Non-Remittances</td>
<td>0.980</td>
<td>0.491</td>
<td>0.987</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.036</td>
<td>0.969</td>
<td>0.620</td>
<td>0.07</td>
<td>Remittances</td>
<td>0.020</td>
<td>0.976</td>
<td>0.289</td>
<td>-0.08</td>
</tr>
<tr>
<td>Total Income</td>
<td>1.000</td>
<td>0.499</td>
<td>1.000</td>
<td></td>
<td>Total Income</td>
<td>1.000</td>
<td>0.481</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>0.941</td>
<td>0.514</td>
<td>0.972</td>
<td>-0.26</td>
<td>Non-Remittances</td>
<td>0.976</td>
<td>0.517</td>
<td>0.992</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.059</td>
<td>0.910</td>
<td>0.303</td>
<td></td>
<td>Remittances</td>
<td>0.024</td>
<td>0.959</td>
<td>0.773</td>
<td>0.10</td>
</tr>
<tr>
<td>Total Income</td>
<td>1.000</td>
<td>0.486</td>
<td>1.000</td>
<td></td>
<td>Total Income</td>
<td>1.000</td>
<td>0.518</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>0.946</td>
<td>0.596</td>
<td>0.986</td>
<td></td>
<td>Non-Remittances</td>
<td>0.985</td>
<td>0.520</td>
<td>0.995</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.031</td>
<td>0.958</td>
<td>0.541</td>
<td>-0.04</td>
<td>Remittances</td>
<td>0.014</td>
<td>0.985</td>
<td>0.437</td>
<td>-0.02</td>
</tr>
<tr>
<td>Total Income</td>
<td>1.000</td>
<td>0.586</td>
<td>1.000</td>
<td></td>
<td>Total Income</td>
<td>1.000</td>
<td>0.516</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>0.794</td>
<td>0.670</td>
<td>0.926</td>
<td></td>
<td>Non-Remittances</td>
<td>0.989</td>
<td>0.476</td>
<td>0.992</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.206</td>
<td>0.916</td>
<td>0.937</td>
<td>0.58</td>
<td>Remittances</td>
<td>0.011</td>
<td>0.989</td>
<td>0.865</td>
<td>0.09</td>
</tr>
<tr>
<td>Total Income</td>
<td>1.000</td>
<td>0.669</td>
<td>1.000</td>
<td></td>
<td>Total Income</td>
<td>1.000</td>
<td>0.476</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Dominican Republic (2004)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>0.914</td>
<td>0.531</td>
<td>0.950</td>
<td></td>
<td>Non-Remittances</td>
<td>0.914</td>
<td>0.531</td>
<td>0.950</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.086</td>
<td>0.953</td>
<td>0.740</td>
<td>0.28</td>
<td>Remittances</td>
<td>0.086</td>
<td>0.953</td>
<td>0.740</td>
<td>0.28</td>
</tr>
<tr>
<td>Total Income</td>
<td>1.000</td>
<td>0.520</td>
<td>1.000</td>
<td></td>
<td>Total Income</td>
<td>1.000</td>
<td>0.520</td>
<td>1.000</td>
<td></td>
</tr>
</tbody>
</table>

Effects of a 1% increase in per capita income from different sources on the Gini coefficient of Total Income.

Source: Acosta et al. (2006).

To complement the previous simulations on the effects of remittances on inequality, we report in Table 3.3 poverty headcounts calculated before and after excluding remittances from the total income of recipients. We employ two commonly used headcount poverty indicators, based on poverty lines of US$1 and US$2 per person per day, measured at PPP values, corresponding respectively to “extreme” and “moderate” poverty. As expected, with this very simple approach remittances lead to large reductions in poverty levels, especially in those countries where migrants tend to come from the lower deciles of the income distribution – notably Mexico, El Salvador and the Dominican Republic, where extreme poverty is estimated to fall by more than 35 percent, and moderate poverty by an average of 19 percent. The reductions in poverty headcounts that result from taking remittances income into consideration are smaller

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10 The US$ 1 and US$ 2 a day are values measured in 1989 international prices and adjusted to local currency using purchasing power parities (PPP) to take into account local prices. Partly because of their simplicity, these are the standard indicators used for international poverty comparisons. For instance, they are periodically presented in the World Development Indicators (World Bank).
when using locally defined country-specific national poverty lines (appendix table A3.1). Thus, while Mexico, El Salvador and the Dominican Republic are still the countries where largest reductions are obtained, the corresponding average changes are of 15 percent for extreme poverty and 8 percent for moderate poverty.

One concern with the above inequality decompositions and poverty simulations is that they implicitly make the unrealistic assumption that remittances can be treated as exogenous transfers by migrants. However, it is reasonable to believe that in many cases migration also entails potential losses of income, associated with the migrants' absence from their families and communities. In other words, remittances are not exogenous transfers but rather they substitute for the home earnings that migrants would have had if they had not decided to leave their countries to work abroad.

<table>
<thead>
<tr>
<th>Country</th>
<th>Less than US$ 1 a day (PPP)</th>
<th>Diff. in %</th>
<th>Less than US$ 2 a day (PPP)</th>
<th>Diff. in %</th>
<th>Country</th>
<th>Less than US$ 1 a day (PPP)</th>
<th>Diff. in %</th>
<th>Less than US$ 2 a day (PPP)</th>
<th>Diff. in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia (2002)</td>
<td>18.400</td>
<td>-0.6</td>
<td>35.261</td>
<td>-0.6</td>
<td>Honduras (2002)</td>
<td>18.681</td>
<td>-2.5</td>
<td>34.772</td>
<td>-3.0</td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>17.764</td>
<td>34.674</td>
<td>16.155</td>
<td>31.731</td>
<td></td>
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</tr>
<tr>
<td>Income</td>
<td>Diff. before/after remitt.</td>
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</tr>
<tr>
<td>Non-Remittances</td>
<td>11.198</td>
<td>-1.6</td>
<td>27.147</td>
<td>-1.5</td>
<td>Total Income</td>
<td>3.165</td>
<td>-2.0</td>
<td>12.695</td>
<td>-2.3</td>
</tr>
<tr>
<td>Income</td>
<td>Diff. before/after remitt.</td>
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<td></td>
</tr>
<tr>
<td>El Salvador (2000)</td>
<td>12.116</td>
<td>-4.4</td>
<td>23.743</td>
<td>-5.7</td>
<td>Nicaragua (2001)</td>
<td>8.763</td>
<td>-0.5</td>
<td>23.323</td>
<td>-0.8</td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>7.700</td>
<td>-36.4%</td>
<td>18.607</td>
<td>-21.6%</td>
<td>Total Income</td>
<td>8.260</td>
<td>22.552</td>
<td></td>
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</tr>
<tr>
<td>Income</td>
<td>Diff. before/after remitt.</td>
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<td>Total Income</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Guatemala (2003)</td>
<td>24.413</td>
<td>-2.8</td>
<td>41.715</td>
<td>-2.6</td>
<td>Paraguay (2003)</td>
<td>6.839</td>
<td>-0.8</td>
<td>16.188</td>
<td>-0.9</td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>21.578</td>
<td>-11.6%</td>
<td>39.087</td>
<td>-6.3%</td>
<td>Total Income</td>
<td>6.057</td>
<td>-11.4%</td>
<td>15.333</td>
<td>-5.3%</td>
</tr>
<tr>
<td>Income</td>
<td>Diff. before/after remitt.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haiti (2001)</td>
<td>60.229</td>
<td>-6.8</td>
<td>76.343</td>
<td>-4.9</td>
<td>Peru (2002)</td>
<td>4.193</td>
<td>0.0</td>
<td>15.644</td>
<td>-0.1</td>
</tr>
<tr>
<td>Non-Remittances</td>
<td>53.425</td>
<td>-11.3%</td>
<td>71.414</td>
<td>-6.5%</td>
<td>Total Income</td>
<td>4.185</td>
<td>-0.2%</td>
<td>15.539</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Income</td>
<td>Diff. before/after remitt.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominican Republic (2004)</td>
<td>7.219</td>
<td>-2.5</td>
<td>16.072</td>
<td>-3.2</td>
<td>Diff. before/after remitt. 0.0</td>
<td>-0.2%</td>
<td>-0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Acosta et al. (2006).

In order to consider these effects one needs to estimate the value that household income would have taken had migrants stayed in their households. To impute per capita household income for migrant families in that counterfactual scenario we predict per capita income levels for households with remittances on the basis of a reduced-form specification for the determinants of income among households without remittances. The estimated model is the following:

\[ \log Y_i = \alpha + \beta X_i + \gamma H_i + \mu_i \] (3)

11 We emphasize the calculations based on common international poverty lines (US$ 1 and US$2 PPP) because they are better suited for international comparisons. However, the appendix to this chapter reports similar calculations based on locally defined poverty lines, which may be of interest for country-specific analysis. It is worth noting that poverty headcounts are in all cases much higher when using local poverty lines – which are higher than their international counterparts.
where $Y_j$ represents per capita non-remittances income, $X_i$ is a vector of household characteristics (demographic and location covariates), $H_i$ is a set of characteristics of the household head, and $\mu_i$ is unobserved heterogeneity in income generation. The procedure consists on estimating equation (3) for the sub sample of households that do not receive remittances, making a correction for possible selection biases. The estimated coefficients allow predicting the counterfactual non-migration income for remittances-recipient households. As explained below, in order to avoid the reduction in income variability for migrant families due to the used of predicted values, we follow Barham and Boucher (1998) in adding to the predicted values of income a simulated error component.

Several issues need to be discussed. First, in the absence of information on migrant characteristics – which is the case in nine out of our eleven countries – it is necessary to make some basic assumptions about the number and the demographics of migrants. In this respect, we follow Rodriguez (1998) – and most of the evidence on international migration - in assuming that on average remittances are sent by a single adult male family member. In addition, we assume that the migrant has the average years of education of other adults in the household. To test the robustness of our results to the above assumptions we compare the corresponding results with those obtained when detailed data on migrants' demographics is employed in lieu of the above assumptions – this is possible only for Nicaragua and Haiti.

Second, OLS estimates of equation (3) would be inconsistent if $\mu_i$ is not independently identically distributed (i.i.d.). In other words, if migrants are not randomly selected from the pool of households, estimates of equation (3) based on the sample of households without migrants could suffer from selection bias. To control for that possibility, we add variables that approximate the "propensity to migrate", in the context of the two-step estimation framework proposed by Heckman (1979). With the assumption stated before concerning migrant characteristics, the estimated coefficients for (3) are used to impute the counterfactual non-remittances per capita household income for recipient families. With this variable one can proceed to calculate the levels of poverty and inequality that would have prevailed had migration and remittances not taken place.

It must be noted, however, that as mentioned by Rodriguez (1998) the variance of the counterfactual income predicted on the basis of observable household characteristics is artificially small, because it ignores unobserved determinants of income. To deal with this problem, we follow Barham and Boucher (1998) and add to the predicted household income a random error component drawn from a distribution with the same properties (mean, variance) of the actual estimated errors. We pursue this approach and obtain 1,000 different estimates of the imputed counterfactual non-remittances income for families with migrants, and the same number of estimates for the poverty and inequality levels that would have prevailed in the above

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12 A similar approach is followed in Barham and Boucher (1998) and Adams (2006). The exclusion restrictions that we employ for the non-remittances selection equation are an index of household assets, the percentage of households that receive remittances in the respective county or province of residence (a proxy for the presence of migrant networks), and their interaction. When information on household assets is missing (Bolivia, Ecuador and Honduras), the network variable is interacted with the number of adult males, which ensures variability at the household level. Additional methodological details can be found in Acosta et al. (2006).
counterfactual scenario. This allows us to report not only point estimates for those variables but also 95% confident intervals, based on the 25th and 975th estimates of the variables — after sorting them ascending order. The resulting estimates for the impact of remittances on inequality and poverty are reported in tables 3.4 and 3.5 respectively.

**Table 3.4. Income Gini Coefficient in Counterfactual Scenario of No-Migration**

<table>
<thead>
<tr>
<th>Country</th>
<th>Gini Coefficient</th>
<th>Difference in Gini before/after remitt.</th>
<th>Diff. in %</th>
<th>Country</th>
<th>Gini Coefficient</th>
<th>Difference in Gini before/after remitt.</th>
<th>Diff. in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia (2002)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>0.556</td>
<td></td>
<td></td>
<td></td>
<td>Non-Remittances Income</td>
<td>0.565</td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(0.553; 0.561)</td>
<td></td>
<td></td>
<td>95% Confidence Interval</td>
<td>(0.564; 0.567)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>0.555</td>
<td>-0.001</td>
<td>-0.3%</td>
<td></td>
<td>Total Income</td>
<td>0.559</td>
<td>-0.006</td>
</tr>
<tr>
<td>Ecuador (2004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>0.501</td>
<td></td>
<td></td>
<td></td>
<td>Non-Remittances Income</td>
<td>0.477</td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(0.500; 0.503)</td>
<td></td>
<td></td>
<td>95% Confidence Interval</td>
<td>(0.477; 0.478)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>0.499</td>
<td>-0.002</td>
<td>-0.5%</td>
<td></td>
<td>Total Income</td>
<td>0.481</td>
<td>0.004</td>
</tr>
<tr>
<td>El Salvador (2000)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>0.497</td>
<td></td>
<td></td>
<td></td>
<td>Non-Remittances Income</td>
<td>0.528</td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(0.494; 0.501)</td>
<td></td>
<td></td>
<td>95% Confidence Interval</td>
<td>(0.519; 0.539)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>0.486</td>
<td>-0.011</td>
<td>-2.1%</td>
<td></td>
<td>Total Income</td>
<td>0.518</td>
<td>-0.010</td>
</tr>
<tr>
<td>Guatemala (2000)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Non-Remittances Income</td>
<td>0.603</td>
<td></td>
<td></td>
<td></td>
<td>Non-Remittances Income</td>
<td>0.515</td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(0.596; 0.615)</td>
<td></td>
<td></td>
<td>95% Confidence Interval</td>
<td>(0.514; 0.517)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>0.586</td>
<td>-0.017</td>
<td>-2.9%</td>
<td></td>
<td>Total Income</td>
<td>0.516</td>
<td>0.001</td>
</tr>
<tr>
<td>Haiti (2001)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>0.725</td>
<td></td>
<td></td>
<td></td>
<td>Non-Remittances Income</td>
<td>0.478</td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(0.703; 0.756)</td>
<td></td>
<td></td>
<td>95% Confidence Interval</td>
<td>(0.476; 0.481)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>0.669</td>
<td>-0.056</td>
<td>-7.7%</td>
<td></td>
<td>Total Income</td>
<td>0.476</td>
<td>-0.002</td>
</tr>
<tr>
<td>Dominican Republic (2004)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>0.519</td>
<td></td>
<td></td>
<td></td>
<td>Non-Remittances Income</td>
<td>0.514</td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(0.514; 0.525)</td>
<td></td>
<td></td>
<td>95% Confidence Interval</td>
<td>(0.514; 0.525)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>0.520</td>
<td>0.001</td>
<td>0.3%</td>
<td></td>
<td>Total Income</td>
<td>0.520</td>
<td>0.001</td>
</tr>
</tbody>
</table>

*Source: Acosta et al. (2006).*

Our results suggest that the Gini coefficients that would have prevailed in the absence of migration would have been generally higher, with the largest difference obtained for Haiti (7.7%), followed by Guatemala (2.9%), El Salvador (2.1%), Nicaragua (1.8%) and Honduras (1.1%). The negative effects of remittances on inequality are much smaller in the other countries and even a positive effect is obtained for the cases of Mexico and the Dominican Republic. The results for the countries for which remittances’ impact is minor or even favoring inequality are consistent with the findings of previous studies that have made attempts to calculate counterfactual pre-remittances income for families with migrants.\(^{13}\) Overall, the estimated inequality reducing effects of remittances are found to be relatively small – 2.7% on average, when significant – albeit they tend to be comparatively larger in countries where remittances represent a higher share of income.

\(^{13}\) Rodriguez (1998), for instance, finds that remittances increase inequality in the Philippines, and the effect rises from 1.27 percent to 7.90 percent when using imputed income instead of reported non-remittances income. Similarly Barham and Boucher (1998), for the case of Bluefields (Nicaragua), find that the Gini for household income falls from 0.47 to 0.43 when using reported figures, but inequality actually rises from 0.38 to 0.43 after correcting the pre-remittances distribution using imputed income for migrant families.
As for the impact of migration and remittances on poverty, the results in table 3.5 suggest that the failure to correct for the reduction in income associated with the absence of migrants from their households may lead to grossly overestimating the poverty reducing effect of remittances. In particular, we find that remittances reduce poverty headcounts in only 6 out of the 11 countries for which data is available – the exceptions being the Dominican Republic, Mexico, Nicaragua, Paraguay and Peru – and they reduce poverty gaps in only 3 cases – Ecuador, Guatemala and Haiti. In two cases, the Dominican Republic and Nicaragua, we even find that remittances are linked to small increases in extreme poverty – respectively of 7.4 and 0.4 percent. Thus, for very poor households in those countries the income lost due to the absence of migrants from their households is less than compensated by the money they send home, possibly because they also under-perform in the job market in destination countries.

Considering all eleven countries and assuming that the remittances share in GDP is as given by BOP statistics, the average estimated impact of remittances on poverty headcounts is such that a 1 percentage point increase in the remittances to GDP ratio reduces moderate and extreme poverty by respectively .37 and .29 percent.

Interestingly, the countries for which we find the largest inequality and poverty reducing effects are not necessarily those where remittances recipients tend to come from lower income groups. Consider, for instance, the cases of El Salvador, Guatemala, Mexico and Paraguay,
where remittances recipients tend to be relatively less educated than the general population – there is “negative” selection into migration – and remittances are more progressively distributed than total income. Only in two of them (El Salvador and Guatemala) do we find that remittances are associated with significant reductions in both inequality and poverty. Moreover, in the other two countries where remittances do appear to reduce poverty and inequality – Haiti and Honduras – remittances recipients are more likely to be found among highly educated individuals, and remittances income is distributed more unequally than total income. If anything, what the four countries where remittances have the largest effects on poverty and inequality have in common is that they are among those in which remittances are highest with respect to GDP.

One complementary approach proposed by Schiff (2006) is to estimate the impact of remittances on poverty focusing exclusively on the population of households which receive remittances. The point is that while the impact of remittances on national poverty levels may be limited, the effect on the poverty status of the families with migrants could be much larger. Table 3.6 reports the results of such analysis, using as a reference group only remittance recipient households rather than all the survey sample – even though the latter continues to be used, as described above, for estimating the counterfactual income of recipients. The first interesting finding from this analysis is that the initial poverty rates – before migration – among households with migrants are lower than those found in the general population. In Peru and Nicaragua, for instance, moderate poverty levels in the no-migration counterfactual had been estimated to be close to 15 and 22 percent respectively at the national level, but they are close to 1 and 12 percent respectively among recipients. Other countries where migrants are considerably less likely to be poor than the average household in the country include Haiti, the Dominican Republic and Honduras. Second, as expected, we find that the effects of remittances on poverty are much larger than in the case when non-recipient households were included in the calculations. The largest absolute reductions in extreme poverty are found in Haiti and Guatemala, with rates that are respectively 15 and 10.7 percentage points below those in the scenario of no migration. Similarly, both in the latter countries and in Bolivia, Honduras and Ecuador, the absolute reductions in moderate poverty are between 10 and 17 percentage points. In contrast, remittances are found to have the effect of slightly increasing poverty levels – even among migrants – in both Mexico and the Dominican Republic.
Table 3.6. Poverty Headcounts among Recipients Households in Counterfactual Scenario of No-Migration

<table>
<thead>
<tr>
<th>Country</th>
<th>US$ 1 a day</th>
<th>Diff. in %</th>
<th>US$ 2 a day</th>
<th>Diff. in %</th>
<th>Country</th>
<th>US$ 1 a day</th>
<th>Diff. in %</th>
<th>US$ 2 a day</th>
<th>Diff. in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Remittances Income</td>
<td>(10.297; 20.118)</td>
<td>-6.5 -43.3%</td>
<td>95% Confidence Interval</td>
<td>(6.703; 8.699)</td>
<td>Total Income</td>
<td>2.769</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(26.619; 39.205)</td>
<td>-10.4 -32.0%</td>
<td>Total Income</td>
<td>(21.260; 24.318)</td>
<td>Diff. before/after remitt.</td>
<td>-4.9 -64.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>(6.060; 8.826)</td>
<td>-4.4 -59.9%</td>
<td>95% Confidence Interval</td>
<td>(0.835; 2.810)</td>
<td>Total Income</td>
<td>3.632</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(20.666; 25.539)</td>
<td>-12.0 -52.4%</td>
<td>Total Income</td>
<td>(10.979; 15.185)</td>
<td>Diff. before/after remitt.</td>
<td>-1.9 -111.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>(4.555; 6.074)</td>
<td>3.348</td>
<td>95% Confidence Interval</td>
<td>(2.049; 3.103)</td>
<td>Total Income</td>
<td>10.813</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(16.658; 19.327)</td>
<td>-12.5 -52.4%</td>
<td>Total Income</td>
<td>(9.751; 15.363)</td>
<td>Diff. before/after remitt.</td>
<td>0.4 -11.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>(17.362; 24.527)</td>
<td>-10.7 -50.9%</td>
<td>95% Confidence Interval</td>
<td>(2.098; 6.018)</td>
<td>Total Income</td>
<td>3.979</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(34.098; 42.246)</td>
<td>-16.7 -44.0%</td>
<td>Total Income</td>
<td>(11.594; 18.158)</td>
<td>Diff. before/after remitt.</td>
<td>-0.1 -1.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominican Republic (2004)</td>
<td>47.225</td>
<td>63.877</td>
<td>Non-Remittances Income</td>
<td>0.051</td>
<td>Colombia (2002)</td>
<td>1.269</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>(45.053; 49.452)</td>
<td>-15.9 -31.7%</td>
<td>95% Confidence Interval</td>
<td>(0.018; 0.692)</td>
<td>Total Income</td>
<td>1.360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(61.686; 66.060)</td>
<td>-10.8 -17.0%</td>
<td>Total Income</td>
<td>(0.244; 2.530)</td>
<td>Diff. before/after remitt.</td>
<td>-0.1 -100.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-1.6 90.4%</td>
<td>-0.4 -3.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Acosta et al. (2006).

III. Inequality and Poverty Effects: Macroeconomic Evidence

An alternative way of estimating the impact of remittances on poverty is by means of a cross-country regression analysis. This is the approach taken by Adams and Page (2005), and the IMF's World Economic Outlook (2005). Both of them find that countries that receive remittances have lower poverty levels. In particular, Adams and Page find that a 10 percent increase in per capita remittances would lead to a 3.5 percent decline in the share of people living in poverty in the corresponding country, and the World Economic Outlook concludes that a 2.5 percentage point increase in the remittances to GDP ratio is associated with a 0.5 percentage point decrease in poverty. However, neither study allows the effect of remittances to vary by country or region. Moreover, as noted in World Economic Outlook (2005), because both studies control separately for the effect of per capita income and income inequality, they miss the effects of remittances that operate through changes in those variables. Thus, they are both likely to under-estimate the poverty effects of remittances.

Table 3.7 reports the results of estimating the impact of remittances on poverty using Adams and Page’s (2005) approach, but allowing the effect to be different in the LAC region than in the rest of the world. The estimated equation is of the following form.

\[ \log P_{it} = \alpha + \beta_1 \log Y_{it} + \beta_2 \log G_{it} + \beta_3 \log R_{it} + \beta_4 \log R_{it} \times \text{lac}_{it} + u_{it} \]  

(4)
where $P$ is a poverty measure of the FGT family (i.e. headcount, poverty gap, or squared poverty gap), $Y$ is a measure of per capita income (either GDP or household mean income), $G$ is the gini coefficient, $R$ stands for remittances measured on a per capita basis, $lac$ is a dummy variable that takes a value of 1 if country $i$ is in the Latin American region and 0 otherwise $u$ is an error term, and $i$ and $t$ identify countries and time periods, respectively. With this set up, a priori one could expect the coefficient on income to be negative and that on the Gini to be positive. The coefficients on remittances and its interactive with the LAC dummy would be our main parameters of interest. A negative value for the former would indicate that remittances lead to lower poverty at the global level, while the sign of $(\beta_3 + \beta_4)$ would determine the direction of the poverty impact of remittances in Latin America.

As seen in table 3.7, the signs and magnitudes of the coefficients for inequality and per capita income are in line with those reported by other studies: averaging across all specifications – with different sets of instrumental variables – a 1 percent increase in per capita income levels would lead to a poverty decline of about 1.1 percent, whereas a 1 percent increase in the Gini coefficient would lead to an increase in poverty of about 1.7 percent. As for the impact of remittances on poverty, table 3.7 suggests that the effect tends to be negative at the global level – although significant in only two of the six specifications – but close to zero in the specific case of the LAC region.

There are a number of potential reasons that may explain these somewhat disappointing results. One is the choice of variable used to proxy for remittances flows. For example, the World Economic Outlook (2005) relies on a similar framework but rather than relating poverty to remittances on a per capita basis it uses remittances as a percentage of GDP. However, replicating the above exercise with this alternative remittances variable does not yield additional support to the idea that remittances significantly lower poverty, either in Latin America or elsewhere. A second explanation could be related to the specification of the model per se. As noted above, in principle one could expect remittances to affect poverty by changing either average income or inequality. Thus, it is difficult to interpret the parameter of remittances in a regression model that controls for the two main potential drivers of poverty reduction.

To deal with this problem, we next assume that per capita income levels follow a lognormal distribution, so that the effect on poverty of a change in remittances will depend on: (i) the impact that remittances have on growth; (ii) how growth is translated into poverty reduction; (iii) the simultaneous impact that remittances have on inequality (as measured by the Gini coefficient), and finally (iv) how inequality changes are translated into poverty reduction. This can be expressed as follows.

\[
\frac{\partial P}{\partial R} = \frac{\partial Y}{\partial Y} \frac{\partial P}{\partial Y} + \frac{\partial G}{\partial G} \frac{\partial P}{\partial G} \tag{5}
\]

Under fairly general conditions it is possible to derive theoretical values for the parameters in channels (ii) and (iv), which correspond to the growth elasticity of poverty $\gamma$ and the inequality elasticity of poverty $\phi$, expected to be respectively negative and positive:
\[
\gamma = \frac{\partial P}{\partial Y} P < 0, \quad \phi = \frac{\partial P}{\partial G} P > 0.
\]

With these elements in mind, a change in poverty due to a change in remittances (which we will denote by \( R \)) can be expressed as:

\[
\frac{\partial P}{\partial R} P = \frac{\partial Y}{\partial R} Y \times \gamma + \frac{\partial G}{\partial R} G \times \phi.
\]

Table 3.7. The impact of per capita remittances on poverty

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>-1.22</td>
<td>-0.78</td>
<td>-1.06</td>
<td>-1.21</td>
<td>-0.59</td>
<td>-1.62</td>
</tr>
<tr>
<td>t-stat</td>
<td>-8.43</td>
<td>-5.26</td>
<td>-1.01</td>
<td>-4.51</td>
<td>-0.62</td>
<td>-4.98</td>
</tr>
<tr>
<td>Gini</td>
<td>2.51</td>
<td>0.56</td>
<td>1.87</td>
<td>2.10</td>
<td>0.69</td>
<td>2.73</td>
</tr>
<tr>
<td>t-stat</td>
<td>4.57</td>
<td>2.17</td>
<td>0.91</td>
<td>2.77</td>
<td>0.79</td>
<td>2.70</td>
</tr>
<tr>
<td>Remitt. per capita</td>
<td>-0.20</td>
<td>-1.11</td>
<td>-1.01</td>
<td>-0.75</td>
<td>-2.05</td>
<td>0.50</td>
</tr>
<tr>
<td>t-stat</td>
<td>-3.08</td>
<td>-4.77</td>
<td>-0.48</td>
<td>-1.53</td>
<td>-0.97</td>
<td>0.90</td>
</tr>
<tr>
<td>Remitt. per capita x lac</td>
<td>0.23</td>
<td>1.69</td>
<td>0.54</td>
<td>0.46</td>
<td>0.85</td>
<td>0.25</td>
</tr>
<tr>
<td>t-stat</td>
<td>2.08</td>
<td>3.37</td>
<td>1.02</td>
<td>3.16</td>
<td>1.30</td>
<td>1.12</td>
</tr>
</tbody>
</table>

The dependent variable is the headcount poverty rate (using a $1 PPP poverty line, in logs). Explanatory variables: per capita income (in logs), the Gini (in logs), lagged remittances per capita, and lagged remittances per capita interacted with a dummy for Latin America. Source: Acosta et al. (2006).

Measuring the effect of inequality on poverty is slightly more complex than estimating the impact of growth. Indeed, inequality can change in infinite manners. Although intuitively progressive distributional change is likely to reduce poverty, this result cannot be generalized without additional assumptions. To make the problem of the impact of inequality changes on poverty tractable, we follow one possibility is to assume that income follows a particular parametric distribution. For example, Lopez and Serven (2006) compare the theoretical quintile shares according to a log-normal distribution with their empirical counterparts using data from 794 household surveys and argue that the log-normal approximation fits the empirical data extremely well. Hence, the empirical problem becomes one of estimating the impact of remittances on income growth and inequality.

In order to estimate the links between remittances and growth in the data, our empirical strategy is based on the addition of a measure of remittances to an otherwise standard empirical growth regression:

\[15\] IV headings indicate that the equation has been estimated using instrumental variables. Instruments considered in the different specifications are Distance to the main sending area (Dist.), Secondary Education (Educ), Government Stability (Gov. Stab), Growth of sender countries weighted by distance (Growth-Dist) and Growth of sender countries weighted by the stock of migrants in receiving country.
where $y$ is the log of per capita income, $r$ is a measure of remittances, $x$ represents a set of control variables other than lagged income, which we shall discuss shortly, $V_i$ is a country-specific effect, and $u_i$ is an i.i.d. error term. According to (8), growth depends on initial income, remittances and current and/or lagged values of the control variables, and the impact of remittances on growth for Latin America would be given by $\beta_1 + \beta_2$.

As for the impact of remittances on inequality, we follow a similar strategy and estimate the following specification:

$$
(\log g_{it} - \log g_{i,t-1}) = \delta_{it} + \omega' x_{it} + \beta_1 r_{it} + \beta_2 r_{it} \times lac_i + \nu_i + v_{it}
$$

where $g$ is the (logged) Gini coefficient, and $\mu_i$ and $\epsilon_i$ are a country-specific effect, and an i.i.d. error term. Analogous to equation (8), the impact of remittances on the changes in inequality for Latin America would be given by $\alpha_1 + \alpha_2$. Table 3.8 reports the results of this exercise.

Overall, it appears that remittances tend to be good for growth (i.e. a higher remittances to GDP ratio tends to be associated with higher growth), both at the global level and in Latin America. In fact, we cannot reject the hypothesis that the impact of remittances on growth is the same in Latin America and in the rest of the world. On the other hand, remittances seem to lead to higher income inequality at the global level but to either reduce or leave inequality unchanged in Latin American (something to be welcomed given the high inequality levels of the region). These basic messages are robust to the use of different instrumental variables to correct for the possible endogeneity of remittances – e.g. the possibility of remittances also being affected by growth or inequality. These results suggest that remittances tend to reduce poverty in Latin America. In terms of the magnitude of the estimated effects, table 3.9 reports the elasticity of poverty with respect to the remittances to GDP ratio obtained for the average Latin American country, for each of the specifications used.

---

16 With regard to the control variables, rather than adding to the already huge variety of growth models, in this chapter we opt for considering a set of controls that has already been used in a number of empirical growth studies. This is the one used by Perotti (1996), Forbes (2000), Banerjee and Duflo (2003), and Knowles (2005), and it includes the average years of secondary education of the male population, the average years of secondary education of the female population, and a measure of market distortions: the price of investment goods relative to the one in the US. All these variables are measured in levels at the beginning of the period.
Table 3.8. The impact of remittances on growth and changes in inequality

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distance</td>
<td>Distance</td>
<td>Migration</td>
<td>Distance</td>
<td>Migration</td>
<td>Distance</td>
<td>Migration</td>
</tr>
<tr>
<td>Remittances (t-1)</td>
<td>0.005</td>
<td><strong>0.012</strong></td>
<td>0.012</td>
<td><strong>0.008</strong></td>
<td><em>0.010</em>*</td>
<td>0.011**</td>
<td>0.009**</td>
</tr>
<tr>
<td></td>
<td>(1.75)</td>
<td>(3.48)</td>
<td>(4.57)</td>
<td>(3.45)</td>
<td>(3.16)</td>
<td>(4.46)</td>
<td>(4.64)</td>
</tr>
<tr>
<td>Remittances (t-1) x LAC</td>
<td>0.000</td>
<td>0.002</td>
<td>-0.003</td>
<td>0.002</td>
<td>-0.008</td>
<td>0.000</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(-0.05)</td>
<td>(0.43)</td>
<td>(-0.66)</td>
<td>(0.49)</td>
<td>(-1.39)</td>
<td>(-0.22)</td>
<td>(1.10)</td>
</tr>
<tr>
<td>Remittances in LAC</td>
<td>0.005</td>
<td>0.014</td>
<td>0.009</td>
<td>0.010**</td>
<td>0.006**</td>
<td>0.011**</td>
<td>0.012**</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0.005</td>
<td>0.001</td>
<td>0.067</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: The dependent variables are either logged changes in per capita income (upper panel) or the Gini (lower panel). Other explanatory variables: either lagged p/c income or the lagged Gini (in logs), average years of secondary education of the female and male population, a measure of market distortion (given by the price of investment goods), remittances (as a percentage of GDP in logs), and remittances interacted with a regional dummy for Latin America. All regressions include a constant. Remittances in LAC presents the value corresponding to the impact of Remittances on Latin American growth or inequality changes. Source: Acosta et al. (2006).

As seen in table 3.9, there is substantial heterogeneity in the effects of remittances on poverty depending upon the country’s initial conditions, as given by the ratio of per capita income to the poverty line, and the Gini coefficient. In the Latin American context, however, this range can be substantially narrowed as most countries in the region have Gini coefficients of around 0.5. Thus, considering that in the average Latin American country remittances are 4.9 percent to GDP, a one percentage point increase in the remittances to GDP ratio is estimated to lead to reductions in poverty that vary between 0.08 percent for poorer countries to 1.12 percent for richer countries, with an average estimated reduction of 0.37 percent, which is fully in line with our micro-econometric results for moderate poverty. On the whole, contrary to the analysis based on Adams and Page’s (2005) approach, when we empirically model the transmission channels from remittances to poverty we find that (i) remittances lead to lower poverty; and (ii) this effect is more marked in Latin America than elsewhere.

17 The regressions are performed using the system GMM estimator. The first column uses only internal instruments. The second to seventh columns use lagged internal instruments for the Gini, average years of secondary education of the female and male population, and the measure of market distortion plus an external instrument which equals the per capita income level in the main migrant host countries weighted distance (Distance) or number of migrants (Migration). Level indicates that the external instrument is the value of the host countries per capita GDP series. Growth indicates that the external instrument is the growth rate of the host countries per capita GDP series. Level, growth combines the levels and growth instruments.

18 See for example Figure 4.7 in Perry et al. (2006).

19 This is the estimated poverty effect of one percentage point increase in the remittances to GDP ratio in a country where that ratio is 4.9 percent and the Gini Coefficient is 0.5, using the average poverty elasticity from all alternative choices of instrumental variables reported in table 8.
### Table 3.9. Poverty elasticity of remittances in Latin America

<table>
<thead>
<tr>
<th>v/z</th>
<th>GMM (Gini Coefficient)</th>
<th>GMM, Distance, Level (Gini Coefficient)</th>
<th>GMM, Distance, Growth (Gini Coefficient)</th>
<th>GMM, Migration, Level (Gini Coefficient)</th>
<th>GMM, Migration, Growth (Gini Coefficient)</th>
<th>GMM, Migration, Level &amp; Growth (Gini Coefficient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>v/z</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
</tr>
<tr>
<td>6</td>
<td>-1.17 -0.68 -0.46 -0.33</td>
<td>-0.94 -0.51 -0.32 -0.20</td>
<td>-0.92 -0.52 -0.33 -0.23</td>
<td>-0.74 -0.44 -0.29 -0.21</td>
<td>-0.64 -0.38 -0.21 -0.15</td>
<td>-0.52 -0.36 -0.21 -0.14</td>
</tr>
<tr>
<td>3</td>
<td>-0.56 -0.34 -0.24 -0.18</td>
<td>-0.59 -0.33 -0.20 -0.14</td>
<td>-0.52 -0.30 -0.19 -0.14</td>
<td>-0.38 -0.23 -0.13 -0.10</td>
<td>-0.29 -0.18 -0.12 -0.08</td>
<td>-0.21 -0.15 -0.11 -0.07</td>
</tr>
<tr>
<td>1.5</td>
<td>-0.32 -0.20 -0.12 -0.11</td>
<td>-0.20 -0.15 -0.10 -0.08</td>
<td>-0.20 -0.15 -0.12 -0.08</td>
<td>-0.16 -0.11 -0.08 -0.06</td>
<td>-0.16 -0.10 -0.08 -0.06</td>
<td>-0.10 -0.08 -0.06 -0.06</td>
</tr>
<tr>
<td>1</td>
<td>-0.19 -0.13 -0.10 -0.08</td>
<td>-0.16 -0.11 -0.08 -0.06</td>
<td>-0.15 -0.11 -0.10 -0.07</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.10 -0.08 -0.06 -0.06</td>
</tr>
<tr>
<td>v/z</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
<td>0.30 0.40 0.50 0.60</td>
</tr>
<tr>
<td>6</td>
<td>-0.53 -0.29 -0.17 -0.11</td>
<td>-0.52 -0.30 -0.19 -0.14</td>
<td>-0.52 -0.30 -0.19 -0.14</td>
<td>-0.38 -0.23 -0.13 -0.10</td>
<td>-0.29 -0.18 -0.12 -0.08</td>
<td>-0.21 -0.15 -0.11 -0.07</td>
</tr>
<tr>
<td>3</td>
<td>-0.35 -0.19 -0.12 -0.08</td>
<td>-0.22 -0.14 -0.09 -0.06</td>
<td>-0.20 -0.15 -0.10 -0.07</td>
<td>-0.16 -0.11 -0.08 -0.06</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.10 -0.08 -0.06 -0.06</td>
</tr>
<tr>
<td>2</td>
<td>-0.25 -0.14 -0.09 -0.06</td>
<td>-0.20 -0.15 -0.10 -0.07</td>
<td>-0.16 -0.11 -0.08 -0.06</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.10 -0.08 -0.06 -0.06</td>
</tr>
<tr>
<td>1.5</td>
<td>-0.18 -0.11 -0.07 -0.05</td>
<td>-0.16 -0.11 -0.08 -0.06</td>
<td>-0.14 -0.10 -0.08 -0.06</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.12 -0.08 -0.06 -0.06</td>
<td>-0.10 -0.08 -0.06 -0.06</td>
</tr>
<tr>
<td>1</td>
<td>-0.10 -0.07 -0.05 -0.03</td>
<td>-0.10 -0.07 -0.05 -0.03</td>
<td>-0.10 -0.07 -0.05 -0.03</td>
<td>-0.10 -0.07 -0.05 -0.03</td>
<td>-0.10 -0.07 -0.05 -0.03</td>
<td>-0.10 -0.07 -0.05 -0.03</td>
</tr>
</tbody>
</table>

**Notes:** The table reports the estimated poverty elasticities of remittances/GDP for different values of the Gini coefficient and of per capita income to the poverty line v/z. It assumes an initial level of remittances of 10 percent of GDP. Source: Acosta et al. (2006).

### IV. Remittances, Growth and Investment

While the above reported results suggest that remittances are positively and significantly related to growth, they are based on a very parsimonious specification. Thus, the question remains as to the extent to which the link between remittances and growth is robust to the inclusion of additional control variables. This question is particularly relevant given that previous cross national empirical evidence on the impact of remittances on growth has not been conclusive.

Faini (2002), for instance, has found that remittances have a positive impact on economic growth, thus confirming the predictions of the new economic migration literature (Stark and Lucas, 1988; Taylor, 1994) according to which remittances promote investment and entrepreneurial activities. However, a broader study conducted for the IMF’s World Economic Outlook (IMF, 2005) finds that there is no significant relationship between remittances and growth in GDP per capita. In addition, Chami, Fullenkamp and Jahjah (2005) find a negative association between the growth rate of immigrant remittances and growth in GDP per capita for a sample of 113 countries over the period 1970-98. Similarly, Giuliano and Ruiz-Arranz (2005) find that the impact of remittances on growth is not significant when remittances are simply added as an additional explanatory variable in a growth regression. They claim that it is likely that the impact of remittances on growth may depend on some structural features of the

---

20 This study uses a sample of 101 developing countries over the period 1970-2003.
economy, and find evidence that remittances enhance growth in countries with shallower financial markets.

There have also been a few studies dealing with the specific case of the Latin America and Caribbean region. Solimano (2003) evaluated the impact of remittances on per capita growth for two Andean countries, Colombia and Ecuador, during the period 1987-2002. He found that lagged remittances have a positive and significant impact on growth in Colombia, but the relationship is not significant for Ecuador. Mundaca (2005) evaluated the effects of workers' remittances on growth for countries in Central America, Mexico and the Dominican Republic during the period 1970-2003. She found that remittances promote growth in the region and that the impact is even stronger in the presence of an active banking sector in the credit market. In the same vein, using a sample of Caribbean countries, Mishra (2005) found that private investment rises by 0.6 percentage point of GDP in response to a 1 percentage point of GDP increase in remittance inflows.

The fact that the results on the growth-remittances link have been somewhat ambiguous is not surprising given the counter-cyclicality of those flows, which suggests that remittances tend to respond negatively to economic growth. Thus, failure to correct for reverse causality and other sources of endogeneity in remittances flows may lead to misleading conclusions regarding the causal relationship from remittances to economic growth. From a conceptual point of view, this relationship could be motivated by the possibility that workers' remittances may help ease credit constraints thus allowing individuals to not only increase their consumption and reduce poverty, but also to augment to lead to higher investments in physical capital, education, health care, and the creation or expansion of micro-enterprises, all of which could eventually be reflected in higher aggregate investment and economic growth. As seen in figure 3.1, even simple scatter plots between remittances, growth and investment using a large cross section of countries tend to suggest the presence of positive correlations between remittances, investment and growth.

Panel data estimates on the impact of remittances and growth are presented in Table 3.10, using a sample of 67 countries, of which 21 are from Latin America and the Caribbean. We find that remittances have a positive and significant impact on growth, and that this effect is robust to the use of external and time varying instrumental variables to control for the potential endogeneity of remittances. All control variables are found to be significant and with the sign that would be a priori expected. That is, growth is found to be higher for countries with lower levels of income, higher levels of education, deeper financial markets, more trade openness, and better institutions, and to be discouraged by excessive government burden, higher inflation and real exchange rate overvaluation. These results improve upon previous estimates, which have either overlooked the issue of the possible endogeneity of remittances, or have addressed it using time-invariant instrumental variables (e.g. IMF, 2005) or internal instruments only (e.g. Giuliano and Ruiz-Arranz, 2005). Moreover, following Loayza, Fajnzylber and Calderón (2005), we

---

21 The only exception is given by column [4] where we instrument remittances with their own lagged levels and differences. This may be inappropriate if remittances are influenced in an inter-temporal optimizing framework by future shocks to economic growth.

22 We use two external instruments constructed by Aggarwal, Demirguc-Kunt and Martinez Peria (2005), based on the real output per capita of the countries where remittances originate. The first instrument is the average output per
now use a wide set of control variables as potential growth determinants, thus reducing possible omitted variable biases.

**Figure 3.1. Scatter plots of Remittances, Growth and Investment**

The magnitude of the estimated effect of remittances on growth is, however, relatively small in economic terms. For the average Latin American country in the sample, for instance, the increase in remittances from 0.7 percent of GDP in 1991-1995 to 2.3 percent of GDP in 2001-2005 is estimated to have led to an increase of only 0.27 percent per year (27 basis points). Moreover, as seen in the final four columns of Table 3.10, when domestic investment is included as an additional explanatory variable, the effect of remittances on growth ceases to be significant. This may imply that one of the main channels through which remittances affect growth is by increasing domestic investment.

---

capita of the top country destinations for migrants across the world weighted by the (inverse of the) distance between the remittance-sender and the remittances-recipient country. The second instrument is the average output per capita of the top five country destinations for migrants in the OECD weighted by the share of migrants of the recipient country in each of these five destinations. We refer to these two variables as the “Distance” and the “Migration” instruments, respectively.
### Table 3.10. Remittances and Economic Growth

<table>
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</tr>
<tr>
<td>Initial GDP per capita (ln)</td>
<td>-0.356 **</td>
<td>-0.291 **</td>
<td>-0.236 **</td>
<td>-0.345 **</td>
<td>-0.438 *</td>
<td>-0.641 **</td>
<td>-0.648 **</td>
<td>-0.624 **</td>
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<td></td>
<td>(0.06)</td>
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<tr>
<td>Macroeconomic Policies and Institutions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Education (Secondary Enrollment, ln)</td>
<td>0.257 **</td>
<td>0.268 **</td>
<td>0.317 **</td>
<td>0.364 **</td>
<td>0.320 **</td>
<td>0.303 **</td>
<td>0.263 **</td>
<td>0.219 *</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(0.11)</td>
<td>(0.13)</td>
<td>(0.08)</td>
<td>(0.10)</td>
<td>(0.13)</td>
<td>(0.13)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Financial Depth (Private Domestic Credit to GDP, ln)</td>
<td>0.620 **</td>
<td>0.384 **</td>
<td>0.499 **</td>
<td>0.523 **</td>
<td>-0.109</td>
<td>-0.468 **</td>
<td>-0.226 *</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>(0.19)</td>
<td>(0.16)</td>
<td>(0.17)</td>
<td>(0.17)</td>
<td>(0.17)</td>
<td>(0.13)</td>
<td>(0.14)</td>
<td>(0.16)</td>
</tr>
<tr>
<td>Institutions (IHS Political Risk Index, ln)</td>
<td>3.888 **</td>
<td>4.233 **</td>
<td>4.105 **</td>
<td>3.678 **</td>
<td>2.918 **</td>
<td>2.387 **</td>
<td>2.339 *</td>
<td>2.934 **</td>
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<tr>
<td></td>
<td>(0.31)</td>
<td>(0.27)</td>
<td>(0.31)</td>
<td>(0.28)</td>
<td>(0.41)</td>
<td>(0.39)</td>
<td>(0.41)</td>
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<tr>
<td>Trade Openness (TO)</td>
<td>0.329 **</td>
<td>0.431 **</td>
<td>0.422 **</td>
<td>0.503 **</td>
<td>-0.466 *</td>
<td>-0.283 *</td>
<td>-0.468 **</td>
<td>-0.156 **</td>
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<td>(0.11)</td>
<td>(0.15)</td>
<td>(0.13)</td>
<td>(0.13)</td>
<td>(0.18)</td>
<td>(0.13)</td>
<td>(0.11)</td>
<td></td>
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<tr>
<td>Lack of Price Stability</td>
<td>-0.907 **</td>
<td>-0.906 **</td>
<td>-0.907 **</td>
<td>-0.906 **</td>
<td>-0.906 **</td>
<td>-0.907 **</td>
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<td>-0.907 **</td>
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<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
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<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>REER Overvaluation</td>
<td>-0.991 **</td>
<td>-0.912 **</td>
<td>-0.912 **</td>
<td>-0.912 **</td>
<td>-0.912 **</td>
<td>-0.912 **</td>
<td>-0.912 **</td>
<td>-0.912 **</td>
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<td>(0.02)</td>
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<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Government Burden (General Govt. Consumption Inc)</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
<td>-0.869 **</td>
</tr>
<tr>
<td></td>
<td>(0.18)</td>
<td>(0.19)</td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.13)</td>
<td>(0.13)</td>
<td>(0.15)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>Workers' Remittances</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances (Workers Remittances to GDP, ln)</td>
<td>0.167 **</td>
<td>0.234 **</td>
<td>0.339 **</td>
<td>0.326</td>
<td>0.963 *</td>
<td>0.493</td>
<td>0.440</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
</tbody>
</table>

Direct estimates of the effect of remittances on the ratio of investment to GDP confirm this hypothesis (table 3.11). In particular, the results suggest that from 1991-1995 to 2001-2005, the increase in remittances in LAC was responsible for a 2 percent increase in the share of domestic investment to GDP. Given the estimated effect of investment on growth from Table 3.10, this implies that between 1991 and 2005 the impact of remittances on economic growth that took place through increased rates of investment was equivalent to 13 basis points per year, or about one half of the total impact of remittances on growth estimated during that period. The remaining effects of remittances on growth could take place through other channels, including the reduction of aggregate volatility, the accumulation of human capital and possible increases in entrepreneurship. However, the finding of a relatively small overall impact of remittances on growth suggests that either the economic importance of those other channels is limited, or there are considerable negative compensating effects of remittances on labor supply and the real exchange rate. We then examine these issues in detail, starting in the next section with a direct analysis of the business cycle properties of remittances and their impact on growth volatility.
Table 3.11. Remittances and Investment

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Persistence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lagged Investment Ratio</td>
<td>0.520**</td>
<td>0.527**</td>
<td>0.547**</td>
<td>0.541** (0.02)</td>
</tr>
<tr>
<td>(in logs)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.01)</td>
</tr>
<tr>
<td><strong>Growth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Growth</td>
<td>0.037**</td>
<td>0.035**</td>
<td>0.034**</td>
<td>0.037** (0.00)</td>
</tr>
<tr>
<td>(in percentages)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Macroeconomic Policies and Institutions</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.035**</td>
<td>0.021</td>
<td>-0.032**</td>
<td>0.020* (0.02)</td>
</tr>
<tr>
<td>(Secondary Enrollment, in logs)</td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Financial Depth</td>
<td>0.047**</td>
<td>0.061**</td>
<td>0.057**</td>
<td>0.041** (0.01)</td>
</tr>
<tr>
<td>(Private Domestic Credit to GDP, in logs)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Institutions</td>
<td>0.319**</td>
<td>0.347**</td>
<td>0.415**</td>
<td>0.235** (0.04)</td>
</tr>
<tr>
<td>(ICRG Political Risk Index, in logs)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Price of Investment</td>
<td>-0.056**</td>
<td>-0.066**</td>
<td>-0.058**</td>
<td>-0.067** (0.02)</td>
</tr>
<tr>
<td>(in logs)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Lack of Price Stability</td>
<td>-5.81E-04**</td>
<td>-3.55E-04**</td>
<td>-2.99E-04*</td>
<td>-7.28E-04** (0.00)</td>
</tr>
<tr>
<td>(inflation rate, in log[100+inf.rate])</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Workers' Remittances</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.007**</td>
<td>0.017**</td>
<td>0.015*</td>
<td>0.003 (0.00)</td>
</tr>
<tr>
<td>(Workers Remittances to GDP, in logs)</td>
<td>(0.00)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>No. Countries</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>No. Observations</td>
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<td>268</td>
<td>268</td>
<td>268</td>
</tr>
<tr>
<td>Specification Tests (p-values)</td>
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<tr>
<td>- Sargan Test</td>
<td>(0.36)</td>
<td>(0.30)</td>
<td>(0.20)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>- 2nd. Order Correlation</td>
<td>(0.95)</td>
<td>(0.98)</td>
<td>(0.89)</td>
<td>(0.99)</td>
</tr>
</tbody>
</table>

All regressions include a constant and time dummies. * (***) denotes statistical significance at the 10 (5) percent level.
Source: Own calculations

V. Remittances and Output Volatility

Output fluctuations in developing countries are substantially more volatile than those in industrial economies, with median welfare cost of business cycles ranging from 10 to 30 times the costs for industrial economies (Pallage and Robe, 2003). To the extent that remittances exhibit a counter-cyclical behavior, they could play a crucial role in smoothing out developing countries’ output fluctuations, and helping maintain macroeconomic stability. This could be the case if remittances were dominated by compensatory transfers, sent by migrants to their families in order to offset or prevent income shortfalls due to negative external shocks (e.g. natural disasters and financial crisis, among others). Such transfers would raise household income at times when recipient economies are in downturn phases of their economic cycles. However, it is also possible that remittances respond to profitable investment opportunities in recipient economies', thus operating as standard private capital flows and behaving pro-cyclically.

Previous evidence on the business cycle properties of remittances flows has so far been inconclusive. Chami, Fullenkamp and Jahjah (2005) find that in general remittances are negatively associated to the income gap of the recipient country with respect to the United States. Similarly, Mishra (2005) and Sayan (2006) show that remittances tend to be countercyclical, respectively among Caribbean countries, and for low and lower-middle income countries. However, when analyzing the behavior of remittances sent by Turkish workers from Germany,
Sayan (2004) finds that they are positively related to real output in Turkey, hence, appearing to behave pro-cyclically. Moreover, the evidence presented by Giuliano and Ruiz-Arranz (2005) suggests that in most cases remittances co-move directly with output fluctuations in recipient countries, with a higher degree of pro-cyclicality in countries with shallower financial systems.

A common shortcoming of previous attempts at determining the cyclical properties of remittances flows is that they have not controlled for the potential endogeneity of output fluctuations. Table 3.12 presents the results of panel regression-based correlations between the cyclical components of remittances and real output in recipient countries, for a sample of 26 Latin American countries, controlling for the possible presence of reverse causality from remittances to GDP, and for the fact that both variables could be affected by a common deterministic time trend, as well as by changes in the output of remittances-sending countries.23

Table 3.12. The Cyclical Behavior of Remittances in Latin America

<table>
<thead>
<tr>
<th>Sample / Filter</th>
<th>Pooled</th>
<th>Fixed and Time Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic GDP growth / Foreign GDP growth</td>
<td>Domestic GDP growth / Foreign GDP growth</td>
</tr>
<tr>
<td></td>
<td>-1.1425 ** / 1.7356</td>
<td>-1.2963 ** / -8.9426</td>
</tr>
<tr>
<td></td>
<td>(0.491) / (1.281)</td>
<td>(0.533) / (28.801)</td>
</tr>
<tr>
<td></td>
<td>-1.3736 ** / 2.2620 **</td>
<td>-1.5691 ** / -3.9062</td>
</tr>
<tr>
<td></td>
<td>(0.581) / (1.029)</td>
<td>(0.529) / (25.843)</td>
</tr>
<tr>
<td></td>
<td>-1.1917 ** / 1.9613 **</td>
<td>-1.3609 ** / 3.5504</td>
</tr>
<tr>
<td></td>
<td>(0.597) / (0.990)</td>
<td>(0.529) / (24.636)</td>
</tr>
</tbody>
</table>

Source: Own calculations

We find that there is a negative and significant relationship between remittances and real output in the remittance-recipient country regardless of the estimation technique used. Moreover, our estimates imply that reductions in real output below the trend are associated with more than proportional increases in the ratio of remittances to GDP above the trend. Thus, for instance, a one standard deviation reduction in real output of 2.7 percent below the trend would be associated with an increase in the ratio of remittances to GDP above the trend of approximately 3.8 percent (using band-pass filter and instrumental variable estimates). On the other hand, we

For the sake of robustness, we use different filters to compute the cyclical components of remittances and GDP: first differences, Hodrick-Prescott filter, and band-pass filter. We also include country-specific and time-specific fixed effects. To instrument real output of remittance-recipient countries we follow Fatas and Mihov (2003) in using lagged levels of this variable and current and lagged fluctuations in international crude oil prices. The real output of the remittance-sending country is approximated by the average foreign GDP growth of the top country destinations for migrants weighted by the (inverse of the) distance between sender and recipient countries ("distance foreign GDP growth") and the average foreign GDP growth of the Top 5 OECD country destinations for migrants weighted by their share of migrants in each country ("migration foreign GDP growth").

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also find a positive association between remittances and the real output of remittance-sending countries – at least when time effects are not included.²⁴

Similar calculations for other developing countries show that the sensitivity of remittances to oscillations in the real output of both recipient and sending countries is larger in Latin America than in the rest of the developing world (figures 3.2 and 3.3). Moreover, at least among developing countries, the counter-cyclicality of remittances appears to increase with income, being highest among upper-middle income countries. However, the sensibility of remittances with respect to fluctuations in the output of sending countries is largest among lower-middle income countries.

Figure 3.2. Remittances’ Sensitivity to Output Fluctuations in Recipient Countries

![Figure 3.2. Remittances’ Sensitivity to Output Fluctuations in Recipient Countries](image)

Source: Own calculations

Figure 3.3. Remittances’ Sensitivity to Output Fluctuations in Sending Countries

![Figure 3.3. Remittances’ Sensitivity to Output Fluctuations in Sending Countries](image)

Source: Own calculations

²⁴ The real output of remittance-sender countries is non-significant whenever we introduce time dummies, suggesting that time-effects are largely capturing variations in the output of those countries.
One concern with the above estimates is that they reflect average responses of remittances to output in the whole sample of LAC countries. Figure 3.4 reports time series estimates obtained country-by-country. Although these results are statistically significant in only 8 of the 26 countries, they suggest considerable heterogeneity, across Latin American countries. Indeed, we find that in 16 out of 26 countries remittances behaved counter-cyclically, with an average coefficient for the output of the recipient country of -2.88. The countries where these estimates are significant include Ecuador, Argentina, Costa Rica and Mexico. On the other hand, in the remaining group of 10 countries, remittances appear to behave pro-cyclically, with significant positive output coefficients for El Salvador, Paraguay and Venezuela. It thus appears that the extent to which remittances operate as compensatory transfers or profit driven capital flows differs considerably across countries.

Figure 3.4. Country Estimates of Remittances' Sensitivity to Own Output

Notwithstanding the somewhat conflicting results on the business cycles properties of remittances flows, several papers have shown that workers' remittances play a critical role in reducing the vulnerability of home-recipient households to large negative shocks. Using aggregate data for 87 countries from 1970 to 2002, Yang (2006) finds that among poorer developing countries remittances increase substantially in the aftermath of natural disasters. Kapur (2004) and Hysenbegasi and Pozo (2002) conclude that remittances increase sharply after large adverse macroeconomic shocks and currency crisis, respectively. Using microeconomic data on Jamaican households, Clarke and Wallsten (2003) show that remittances have operated as a partial insurance mechanism, covering 25 percent of hurricane damages. Similar conclusions have been obtained by Yang and Choi (2005) for the Philippines, where workers' remittances replace approximately 60 percent of exogenous declines in income, and the World Bank (2005), which shows that remittances have increased after floods in Bangladesh, and hurricanes in the Dominican Republic, Haiti and Honduras.
Figure 3.5 shows the evolution of remittances in the wake of sudden stops in capital flows and currency crises. We find that in Latin America, as well as in the rest of the developing world remittances (as a percentage of GDP) have clearly declined in the periods preceding both types of severe negative shocks, but they have increased considerably thereafter. In particular, in the year after a sudden stop remittances to Latin America have increased by 0.35 percent of GDP (0.43 percent for currency crises). By the 4th year the average increase with respect the level of remittances preceding the sudden stop is 0.75 percent of GDP (2.74 percent for currency crises).

The result that on average remittances behave counter-cyclically, as well as the evidence that they tend to increase after severe crises suggest that they should reduce the volatility of output per capita of recipient countries. This has been previously highlighted by the International Monetary Fund (2005), which finds that a 2.5 percentage point increase in the ratio of remittances to GDP is correlated, on average, with a one-sixth decline in aggregate output volatility. Moreover, remittances are found to improve the creditworthiness of recipient countries, as illustrated by a positive and robust association between remittances and credit ratings for sovereign debt. For instance, model-based calculations show that including remittances in creditworthiness assessments would improve the credit ratings of Haiti by two notches (from CCC to B-) and of Nicaragua by one notch (from CCC+ to B-). As shown by the World Bank (2005), these improvements would imply a reduction in the sovereign spread of 334 and 209 basis points, respectively.

Figure 3.5. The response of Remittances to Macroeconomic Crises

---

25 We define and time these events following respectively Frankel and Cavallo (2004) and, for currency crises, the episodes defined in Frankel and Rose (1996), Kaminsky and Reinhart (1999), and Goldstein, Kaminsky and Reinhart (2000).
Additional evidence on the impact of remittances on the volatility of output growth is provided in Table 3.13, which shows the impact of workers’ remittances on the standard deviation of GDP per capita growth, controlling for standards determinants of growth volatility. The later include macroeconomic policy variables, external shocks and country- and time-specific effects. We find that there is a robust negative relationship between workers’ remittances and growth volatility. This implies that countries with larger remittance flows (as percentage of GDP) tend to have less volatile (or more stable) real output fluctuations. Economically speaking, a one standard deviation increase in remittances (1.72) would reduce the standard deviation of growth in real output per capita by more than 10 percent, from a sample average of 3.01 to 2.67. The volatility reducing effects of remittances increase with per capita income, as evidenced by the estimated negative sign of an interactive between remittances and GDP per capita. Quantitatively, the reduction in volatility that follows a one standard deviation increase in remittances is almost twice as large for countries close to the 80th percentile of the distribution of per capita income (about $3000), compared to countries with the sample’s median income (about $1,000). In contrast, for those countries with per capita incomes below $300 (the 15th percentile of the distribution), remittances are estimated to heighten macroeconomic volatility.

Table 3.13. Remittances and Growth Volatility

<table>
<thead>
<tr>
<th>Variable</th>
<th>S.D. Growth in Real GDP per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inflation Volatility</strong></td>
<td></td>
</tr>
<tr>
<td>(S.D. annual log differences of CPI)</td>
<td>0.006 **</td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Monetary Policy Volatility</strong></td>
<td></td>
</tr>
<tr>
<td>(S.D. annual log differences of Money)</td>
<td>0.133 **</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
</tr>
<tr>
<td><strong>Fiscal Policy Volatility</strong></td>
<td></td>
</tr>
<tr>
<td>(S.D. annual log differences of Govt. Consumption)</td>
<td>0.100 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td><strong>RER Overvaluation</strong></td>
<td></td>
</tr>
<tr>
<td>(Proportional index in logs, overvaluation if &gt;0)</td>
<td>0.010 **</td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Systemic Banking Crises</strong></td>
<td></td>
</tr>
<tr>
<td>(Frequency of years under crises: 0-1)</td>
<td>1.121 **</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
</tr>
<tr>
<td><strong>Trade Openness (TO)</strong></td>
<td></td>
</tr>
<tr>
<td>(Real Exports and Imports to GDP, in logs)</td>
<td>-0.541 **</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
</tr>
<tr>
<td><strong>Workers’ Remittances</strong></td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.183 **</td>
</tr>
<tr>
<td>(Workers Remittances to GDP, logs)</td>
<td>(0.02)</td>
</tr>
<tr>
<td><strong>Volatility of Foreign Shocks</strong></td>
<td></td>
</tr>
<tr>
<td>Volatility of Terms of Trade Changes</td>
<td>0.009 **</td>
</tr>
<tr>
<td>(S.D. annual log differences of TOT)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Volatility of Foreign Growth Volatility</td>
<td>0.103 **</td>
</tr>
<tr>
<td>(S.D. annual log differences of Foreign Growth)</td>
<td>(0.05)</td>
</tr>
<tr>
<td><strong>Countries / Observations</strong></td>
<td>89 / 359</td>
</tr>
<tr>
<td>- Sargan Test</td>
<td>(0.49)</td>
</tr>
<tr>
<td>- 2nd. Order Correlation</td>
<td>(0.44)</td>
</tr>
</tbody>
</table>

Source: Own calculations

We also find evidence that external shocks, fiscal and monetary policy shocks, real exchange overvaluations and banking crises have a smaller volatility increasing effect in countries with higher levels of remittances. Indeed, interactives between measures of those various shocks and the share of remittances in GDP are found to have negative and significant coefficients in our volatility regressions. To illustrate this finding, table 3.14 reports the impact on volatility of various types of shocks for countries located in different deciles of the remittances distribution. In the case of external shocks we find that for countries in the first
decile of the remittances distribution – with a share of remittances in GDP below 0.1 percent – a
one standard deviation change in a country’s terms of trade or in the volatility of its main trading
partners increases the standard deviation of per capita GDP growth by respectively 0.27 and
1.06. In contrast, the effect of those shocks for countries in the sixth decile of the remittances
distribution – with an average remittances share of 2.3 percent of GDP – is only a 0.08 increase
in volatility (for both types of shocks). Similarly, more volatile fiscal and monetary policies,
higher real exchange rate overvaluations and more frequent banking crises increase growth
volatility to a much lower extent in countries with higher remittances shares.

Table 3.14. Volatility Effects of External and Policy Shocks by Remittances Levels (changes
in std. dev. of p/c GDP Growth after one std. dev. shock)

<table>
<thead>
<tr>
<th>Distribution of Remittances (deciles)</th>
<th>Shocks to Growth Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volatile External Shocks</td>
</tr>
<tr>
<td></td>
<td>Terms of Trade</td>
</tr>
<tr>
<td>I</td>
<td>0.272 **</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
</tr>
<tr>
<td>II</td>
<td>0.202 **</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
</tr>
<tr>
<td>III</td>
<td>0.162 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>IV</td>
<td>0.130 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>V</td>
<td>0.102 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>VI</td>
<td>0.077 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>VII</td>
<td>0.052 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>VIII</td>
<td>0.030 **</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>IX</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
</tr>
<tr>
<td>X</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
</tr>
</tbody>
</table>

Source: Own calculations

V. Conclusions

This chapter has shown that migration and remittances have a significant poverty
reducing effect that appears to operate mainly through increases in per capita income of
remittances-receiving countries. Our cross-country and micro-based estimates yield very similar
conclusions, suggesting that for each percentage point increase in the share of remittances to
GDP, the fraction of the population living in poverty is reduced by about 0.4 percent. However,
the poverty and inequality impact of remittances varies considerably across countries, depending
on their general level of development, initial inequality and on the segments of the income
distribution where remittances-receiving households are concentrated.

The chapter has also shown that remittances have a positive and significant impact on
growth. This effect is robust to corrections for the potential endogeneity of remittances, and the
use a wide set of control variables as potential growth determinants. However, the magnitude of
the estimated effect of remittances on growth is found to be relatively small in economic terms. For the average Latin American country in the sample, for instance, the increase in remittances from 0.7 percent of GDP in 1991-1995 to 2.3 percent of GDP in 2001-2005 is estimated to have led to an increase of only 0.27 percent per year in per capita GDP growth.

With regard to the channels through which remittances affect economic growth, direct estimates of the effect of remittances on the ratio of investment to GDP suggest that about one half of the impact of remittances on growth takes place through increased rates of domestic investment. Another important channel is the reduction of aggregate volatility. Indeed, the evidence indicates that remittances behave counter cyclically in most countries of the region and they increase sharply after macroeconomic crises. Moreover, after controlling for various sources of external and policy shocks, we find that remittances significantly reduce growth volatility, both directly and by diminishing the impact on the economy of external and macroeconomic policy shocks.
Annex 1: Remittances and Poverty Headcounts using National Poverty Lines

**Table A3.1. Poverty Headcounts before and after remittances (national poverty lines)**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Bolivia (2002)</strong></td>
<td></td>
<td></td>
<td><strong>Honduras (2002)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>38.086</td>
<td>61.780</td>
<td>Non-Remittances Income</td>
<td>39.136</td>
<td>60.000</td>
</tr>
<tr>
<td>Total Income</td>
<td>37.480</td>
<td>61.254</td>
<td>Total Income</td>
<td>36.039</td>
<td>57.027</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-0.6 -1.6%</td>
<td>-0.5 -0.9%</td>
<td>Diff. before/after remitt.</td>
<td>3.1 -7.9%</td>
<td>-3.0 -5.0%</td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>27.484</td>
<td>54.449</td>
<td>Non-Remittances Income</td>
<td>24.291</td>
<td>29.970</td>
</tr>
<tr>
<td>Total Income</td>
<td>25.793</td>
<td>52.628</td>
<td>Total Income</td>
<td>22.171</td>
<td>28.069</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-1.7 -6.2%</td>
<td>-1.8 -3.3%</td>
<td>Diff. before/after remitt.</td>
<td>-2.1 -8.7%</td>
<td>-2.0 -6.5%</td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>22.715</td>
<td>43.063</td>
<td>Non-Remittances Income</td>
<td>29.470</td>
<td>52.351</td>
</tr>
<tr>
<td>Total Income</td>
<td>17.684</td>
<td>38.737</td>
<td>Total Income</td>
<td>28.522</td>
<td>51.441</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-5.0 -22.1%</td>
<td>-4.3 -10.0%</td>
<td>Diff. before/after remitt.</td>
<td>-0.9 -3.2%</td>
<td>-0.9 -1.7%</td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>34.077</td>
<td>60.536</td>
<td>Non-Remittances Income</td>
<td>24.025</td>
<td>47.727</td>
</tr>
<tr>
<td>Total Income</td>
<td>32.060</td>
<td>58.780</td>
<td>Total Income</td>
<td>23.097</td>
<td>43.676</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-2.0 -5.9%</td>
<td>-1.6 -2.9%</td>
<td>Diff. before/after remitt.</td>
<td>0.1 0.7%</td>
<td>0.1 0.3%</td>
</tr>
<tr>
<td><strong>Haiti (2001)</strong></td>
<td></td>
<td></td>
<td><strong>Peru (2002)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>89.613</td>
<td>96.526</td>
<td>Non-Remittances Income</td>
<td>23.107</td>
<td>44.047</td>
</tr>
<tr>
<td>Total Income</td>
<td>85.391</td>
<td>94.521</td>
<td>Total Income</td>
<td>22.923</td>
<td>43.676</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-1.2 -6.6%</td>
<td>-1.3 -3.2%</td>
<td>Diff. before/after remitt.</td>
<td>-0.3 -0.9%</td>
<td>-0.8 -1.6%</td>
</tr>
<tr>
<td><strong>Dominican Republic (2004)</strong></td>
<td></td>
<td></td>
<td><strong>Peru (2002)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>25.539</td>
<td>53.934</td>
<td>Non-Remittances Income</td>
<td>26.079</td>
<td>53.894</td>
</tr>
<tr>
<td>Total Income</td>
<td>21.741</td>
<td>49.952</td>
<td>Total Income</td>
<td>22.923</td>
<td>43.676</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-3.8 -14.9%</td>
<td>-4.6 -7.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table A3.2. Poverty Headcounts in Counterfactual Scenario of No-Migration (national poverty lines)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Bolivia (2002)</strong></td>
<td></td>
<td></td>
<td><strong>Honduras (2002)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>37.801</td>
<td>61.660</td>
<td>Non-Remittances Income</td>
<td>37.566</td>
<td>58.973</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(37.583; 38.021)</td>
<td>(61.433; 61.904)</td>
<td>95% Confidence Interval</td>
<td>(37.403; 37.735)</td>
<td>(58.797; 59.148)</td>
</tr>
<tr>
<td>Total Income</td>
<td>37.480</td>
<td>61.254</td>
<td>Total Income</td>
<td>36.039</td>
<td>57.027</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-0.4 -0.7%</td>
<td>-0.4 -0.7%</td>
<td>Diff. before/after remitt.</td>
<td>-1.5 -4.1%</td>
<td>-1.9 -3.3%</td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>26.507</td>
<td>53.629</td>
<td>Non-Remittances Income</td>
<td>22.025</td>
<td>47.272</td>
</tr>
<tr>
<td>Total Income</td>
<td>25.793</td>
<td>52.628</td>
<td>Total Income</td>
<td>23.097</td>
<td>43.676</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-2.0 -5.9%</td>
<td>-1.6 -2.9%</td>
<td>Diff. before/after remitt.</td>
<td>-0.9 -3.2%</td>
<td>-0.7 -1.4%</td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>18.933</td>
<td>40.034</td>
<td>Non-Remittances Income</td>
<td>23.478</td>
<td>52.265</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(18.693; 18.178)</td>
<td>(39.700; 40.348)</td>
<td>95% Confidence Interval</td>
<td>(28.348; 29.253)</td>
<td>(51.659; 52.871)</td>
</tr>
<tr>
<td>Total Income</td>
<td>17.684</td>
<td>38.737</td>
<td>Total Income</td>
<td>28.522</td>
<td>51.441</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-1.2 -6.6%</td>
<td>-1.3 -3.2%</td>
<td>Diff. before/after remitt.</td>
<td>-0.3 -0.9%</td>
<td>-0.8 -1.6%</td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>33.300</td>
<td>59.675</td>
<td>Non-Remittances Income</td>
<td>23.216</td>
<td>47.203</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(32.911; 33.682)</td>
<td>(59.323; 60.049)</td>
<td>95% Confidence Interval</td>
<td>(28.348; 29.253)</td>
<td>(51.659; 52.871)</td>
</tr>
<tr>
<td>Total Income</td>
<td>32.060</td>
<td>58.780</td>
<td>Total Income</td>
<td>23.097</td>
<td>47.039</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-1.2 -3.7%</td>
<td>-0.9 -1.5%</td>
<td>Diff. before/after remitt.</td>
<td>-0.1 -0.5%</td>
<td>-0.2 -0.3%</td>
</tr>
<tr>
<td><strong>Haiti (2001)</strong></td>
<td></td>
<td></td>
<td><strong>Peru (2002)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>87.959</td>
<td>94.894</td>
<td>Non-Remittances Income</td>
<td>22.951</td>
<td>43.759</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(87.406; 88.494)</td>
<td>(94.447; 95.347)</td>
<td>95% Confidence Interval</td>
<td>(22.910; 22.996)</td>
<td>(43.678; 43.845)</td>
</tr>
<tr>
<td>Total Income</td>
<td>85.391</td>
<td>94.521</td>
<td>Total Income</td>
<td>22.923</td>
<td>43.676</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-2.6 -2.9%</td>
<td>-0.4 -0.4%</td>
<td>Diff. before/after remitt.</td>
<td>0.0 -0.1%</td>
<td>-0.1 -0.2%</td>
</tr>
<tr>
<td><strong>Dominican Republic (2004)</strong></td>
<td></td>
<td></td>
<td><strong>Peru (2002)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Remittances Income</td>
<td>22.270</td>
<td>50.680</td>
<td>Non-Remittances Income</td>
<td>22.270</td>
<td>43.759</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(21.957; 22.624)</td>
<td>(50.198; 51.156)</td>
<td>95% Confidence Interval</td>
<td>(22.910; 22.996)</td>
<td>(43.678; 43.845)</td>
</tr>
<tr>
<td>Total Income</td>
<td>21.741</td>
<td>49.952</td>
<td>Total Income</td>
<td>22.923</td>
<td>43.676</td>
</tr>
<tr>
<td>Diff. before/after remitt.</td>
<td>-0.5 -2.4%</td>
<td>-0.7 -1.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>---------</td>
<td>----------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (29.310; 42.239)</td>
<td>(49.960; 63.206)</td>
<td></td>
<td>95% Confidence Interval (26.046; 28.888)</td>
<td>(50.372; 53.785)</td>
</tr>
<tr>
<td></td>
<td>Total Income 26.346</td>
<td>44.918</td>
<td></td>
<td>Total Income 13.476</td>
<td>34.206</td>
</tr>
<tr>
<td></td>
<td>Diff. before/after remitt. -9.4</td>
<td>-26.3%</td>
<td></td>
<td>Diff. before/after remitt. -14.0</td>
<td>-50.9%</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (29.310; 42.239)</td>
<td>(49.960; 63.206)</td>
<td></td>
<td>95% Confidence Interval (26.046; 28.888)</td>
<td>(50.372; 53.785)</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (19.069; 23.791)</td>
<td>(44.219; 50.534)</td>
<td></td>
<td>95% Confidence Interval (18.356; 28.899)</td>
<td>(31.501; 37.311)</td>
</tr>
<tr>
<td></td>
<td>Total Income 10.380</td>
<td>31.987</td>
<td></td>
<td>Total Income 28.680</td>
<td>36.660</td>
</tr>
<tr>
<td></td>
<td>Diff. before/after remitt. -11.0</td>
<td>-51.4%</td>
<td></td>
<td>Diff. before/after remitt. 2.5</td>
<td>9.6%</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (19.069; 23.791)</td>
<td>(44.219; 50.534)</td>
<td></td>
<td>95% Confidence Interval (18.356; 28.899)</td>
<td>(31.501; 37.311)</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (15.505; 18.002)</td>
<td>(37.864; 41.224)</td>
<td></td>
<td>95% Confidence Interval (13.110; 19.387)</td>
<td>(31.965; 39.995)</td>
</tr>
<tr>
<td></td>
<td>Total Income 10.293</td>
<td>32.826</td>
<td></td>
<td>Total Income 14.623</td>
<td>30.792</td>
</tr>
<tr>
<td></td>
<td>Diff. before/after remitt. -6.5</td>
<td>-38.6%</td>
<td></td>
<td>Diff. before/after remitt. -1.6</td>
<td>-9.8%</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (15.505; 18.002)</td>
<td>(37.864; 41.224)</td>
<td></td>
<td>95% Confidence Interval (13.110; 19.387)</td>
<td>(31.965; 39.995)</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (27.961; 35.852)</td>
<td>(49.812; 58.064)</td>
<td></td>
<td>95% Confidence Interval (20.702; 28.991)</td>
<td>(46.745; 57.502)</td>
</tr>
<tr>
<td></td>
<td>Total Income 18.830</td>
<td>44.621</td>
<td></td>
<td>Total Income 21.641</td>
<td>48.199</td>
</tr>
<tr>
<td></td>
<td>Diff. before/after remitt. -13.1</td>
<td>-40.0%</td>
<td></td>
<td>Diff. before/after remitt. -2.9</td>
<td>-12.0%</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (27.961; 35.852)</td>
<td>(49.812; 58.064)</td>
<td></td>
<td>95% Confidence Interval (20.702; 28.991)</td>
<td>(46.745; 57.502)</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (77.725; 81.825)</td>
<td>(87.852; 91.114)</td>
<td></td>
<td>95% Confidence Interval (1.313; 4.376)</td>
<td>(9.330; 15.233)</td>
</tr>
<tr>
<td></td>
<td>Total Income 70.322</td>
<td>88.126</td>
<td></td>
<td>Total Income 1.769</td>
<td>9.184</td>
</tr>
<tr>
<td></td>
<td>Diff. before/after remitt. -2.5</td>
<td>-11.9%</td>
<td></td>
<td>Diff. before/after remitt. -1.0</td>
<td>-35.2%</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (77.725; 81.825)</td>
<td>(87.852; 91.114)</td>
<td></td>
<td>95% Confidence Interval (1.313; 4.376)</td>
<td>(9.330; 15.233)</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval (13.811; 16.412)</td>
<td>(38.855; 42.947)</td>
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<td>95% Confidence Interval (13.811; 16.412)</td>
<td>(38.855; 42.947)</td>
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<tr>
<td></td>
<td>Total Income 12.826</td>
<td>37.685</td>
<td></td>
<td>Total Income 12.826</td>
<td>37.685</td>
</tr>
<tr>
<td></td>
<td>Diff. before/after remitt. -2.3</td>
<td>-15.3%</td>
<td></td>
<td>Diff. before/after remitt. -5.2</td>
<td>-25.0%</td>
</tr>
</tbody>
</table>
Chapter 4

Remittances and Household Behavior

By increasing the income of recipient households, remittances can lead to changes in savings, expenditure patterns and other household behaviors. For instance, remittances may allow previously poor families to meet their basic food needs and subsequently increase their expenditures in housing, education or health. Expenditure patterns can also change if migrants tie remittances' flows to specific expenditures, or if migration changes the preferences or incentives of those that are left behind. For instance, to the extent that migrants tend to work in occupations requiring limited schooling, the returns from investments in education may be lower for those that are envisaging international migration. Health outcomes can also change possibly through a combination of increases in income and information transferred by remittances senders. Finally, by affecting local labor market conditions and household budget constraints, remittances may alter labor force participation decisions, and tilt individuals' occupational choices towards home production and/or entrepreneurship.

I. Introduction

Do recipient households save a fraction of remittances income? Are remittances spent mostly on “conspicuous” consumption goods? Do households that receive remittances destine a larger fraction of their income to investments in housing? How do expenditures in education and health vary with remittances? Are they reflected in better educational and health outcomes? Are remittances associated with changes in labor market participation? These questions have usually been at the center of the public debate on the impact of remittances on recipient communities. However, there is little rigorous empirical evidence on a wide set of countries to inform that debate, which is thus often based on country case studies and anecdotal evidence. This chapter aims at reducing this gap, using the household survey data employed in chapters 1 and 3 to describe recipients’ profiles and estimate remittances poverty effects. In particular, to allow for the impact of remittances to vary throughout the income distribution, we use the household income estimated in chapter 3 for the counterfactual scenario of no migration, to compare the

* This chapter is based on the background paper “Remittances and Household Behavior,” prepared by Pablo Acosta and Pablo Fajnzylber.
behavior of recipient households with other households with similar characteristics (including per capita income prior to migration). Since some of the behaviors under analysis exhibit different patterns by gender and also across urban and rural areas, when appropriate we also allow the impact of remittances to vary along those dimensions.

II. Remittances and Household Savings

One of the main channels through which migration and remittances can affect household welfare is by providing mechanisms to smooth consumption in the context of negative external shocks. Indeed, in the absence of efficient credit and insurance mechanisms, migration and remittances can play an important role by allowing households to diversify their income sources and thus operate as ex-ante risk coping mechanisms. In addition, households also react to negative shocks – ex-post – by sending some its members to work abroad, or by asking existing migrants for additional monetary assistance during bad times. That this effectively happens in practice is confirmed by the evidence presented in the previous chapter regarding the countercyclicality of remittances flows.

A third channel through which remittances could help households smooth out the effects of negative shocks and increase their welfare is by allowing increases in savings and the accumulation of assets. Once again, the macro level evidence presented in the previous chapter on the positive effect of remittances on investment rates would suggest that aggregate savings are likely to be affected as well. Moreover, as shown in the next chapter, both macro and micro data indicate that remittances tend to increase bank deposits, which suggests that recipient households are able to save some of the income from that source. Despite these indications, there is no direct evidence regarding the saving behavior of remittances recipients. This section attempts to fill that gap on the basis of household surveys from six LAC countries, which contain information on income (including remittances) and expenditures.26

We calculate saving rates as the difference between total income and expenditures as a fraction of the former. The darker bars in Figure 4.1 below show the differences between saving rates of recipients and non-recipients: in four out of the six countries, recipients save more than non-recipients, the only exceptions being Mexico and El Salvador. However, since saving rates are known to increase with income,27 the saving behavior of remittance recipients in the latter countries could be driven by the fact that, as shown in chapter 1, migrants in Mexico and El Salvador tend to come from lower income quintiles. To avoid potential spurious saving differentials between recipients and non-recipients, we estimate a simple model of savings as a function of income quintiles – using the counterfactual pre-migration income variable calculated in the previous chapter – as well as other demographic characteristics of the household. The estimated equation is of the following form.

\[ S_i = \alpha + \beta x_i + \gamma h_i + \delta R_i + e_i \]  

26 These countries are Mexico, El Salvador, Guatemala, Peru, Nicaragua and the Dominican Republic.
27 See Butelmann and Gallego (2001) and the references therein.
where $S_i$ represents per capita non-remittances income, $X_i$ is a vector of household characteristics (including the income quintile to which it pertains), $H_i$ is a set of characteristics of the household head, $R_i$ is a "dummy" variable for households that receive remittances, and $\epsilon_i$ is a random error term. The differences in saving rates between recipients and other households after controlling for income and other household characteristics are given by the estimated $\delta$ coefficients, which are reported as the brighter bars in figure 4.1. Somewhat surprisingly, the saving rates of Mexican and Salvadoran recipients turn out to be even lower in comparison with those of non-recipients in similar income ranges and sharing other common characteristics. Moreover, in the cases of Peru and Nicaragua we now find lower saving rates for recipients. One possible interpretation of these results is that remittances may be largely operating as ex-post risk coping mechanisms for households which have suffered negative shocks to income. These shocks may have forced them to save a lower fraction of their income and even exhibit negative savings, which would explain the lower saving rates than non-recipients despite the higher income derived from remittances. The evidence for Guatemala and the Dominican Republic, however, suggest a different pattern, with recipient households saving between 5 and 9 percent more of their income than non-recipients with similar demographic and income characteristics.

**Figure 4.1. Differences in Saving rates by Remittance Recipient Status**

![Figure 4.1: Differences in Saving rates by Remittance Recipient Status](image)

Source: Author’s calculations based on household surveys

In order to examine how remittances affect household behavior throughout the income distribution, we have also calculated saving rates for the various income quintiles and compared them by remittances status. This is reported in table 4.1 below which, for the six countries, shows

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28 The set of household and head characteristics includes dummies for income quintiles, quartiles in age for the household head, the average education of adults, the number of male and female children aged 6 to 17, the number of children under age 5, the number of males and females aged 18 to 65, a dummy variable for rural households, the proportion of households with sanitary services in the county of residence, the proportion of household heads working in agricultural activities in the county of residence, and state/province indicators.

29 We have also estimated two stage least square regressions in which remittances are instrumented with the share of households in the county interacted with household characteristics that affect their likelihood to migrate. The results are qualitatively similar to those reported in figure 1, in the sense that the sign and significance of the differences between the saving rates of recipient and non-recipients remain.
the expected pattern of savings increasing with household income (column 1). The same pattern is observed for non-recipients (column 3). In the case of remittances recipients, however, saving rates increase with income only in the case of the Dominican Republic, with different patterns emerging in the other five countries (column 2). Thus, in Mexico, Peru and Guatemala saving rates do increase from the first to the 2nd or even 3rd income quintiles, but they fall again for recipients located in the upper quintiles, thus creating an inverted-U pattern between savings and income. Possible explanations include the absence from the household, in the case of better-off recipients, of a larger number of income generating migrants – see chapter 2 on the evidence that richer migrants tend to bring along most of their direct relatives. However, in El Salvador and Nicaragua a U-shaped pattern is suggested by the data, with lower income recipient households exhibiting saving rates that are above those of the middle class, which in turn saves less than households in the top income quintiles.

Table 4.1. Saving rates by Income Quintile and Remittance Recipient Status

<table>
<thead>
<tr>
<th>Country</th>
<th>Counterfactual Income Quintiles</th>
<th>Savings Rates</th>
<th>Savings Rates</th>
<th>Savings Rates</th>
<th>Savings Rates</th>
<th>Savings Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>Rem. Recipi</td>
<td>Non-Recipi</td>
<td>Difference R-NR</td>
<td>OLS Coefficients for Rem</td>
</tr>
<tr>
<td>Mexico</td>
<td>Q1</td>
<td>-0.051</td>
<td>0.013</td>
<td>-0.054</td>
<td>0.067**</td>
<td>0.073**</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>0.029</td>
<td>0.064</td>
<td>0.026</td>
<td>0.037*</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>0.090</td>
<td>0.112</td>
<td>0.088</td>
<td>-0.025</td>
<td>-0.016</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>0.158</td>
<td>0.088</td>
<td>0.163</td>
<td>-0.157***</td>
<td>-0.112***</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>0.244</td>
<td>0.017</td>
<td>0.249</td>
<td>-0.231***</td>
<td>-0.277***</td>
</tr>
<tr>
<td>El Salvador</td>
<td>Q1</td>
<td>0.285</td>
<td>0.514</td>
<td>0.252</td>
<td>0.262***</td>
<td>0.244***</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>0.480</td>
<td>0.484</td>
<td>0.479</td>
<td>0.480</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>0.534</td>
<td>0.501</td>
<td>0.544</td>
<td>-0.043***</td>
<td>-0.037***</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>0.592</td>
<td>0.503</td>
<td>0.621</td>
<td>-0.118***</td>
<td>-0.093***</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>0.653</td>
<td>0.518</td>
<td>0.687</td>
<td>-0.170***</td>
<td>-0.167***</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Q1</td>
<td>-0.418</td>
<td>-0.042</td>
<td>-0.479</td>
<td>0.437***</td>
<td>0.413***</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>-0.184</td>
<td>0.057</td>
<td>-0.220</td>
<td>0.277***</td>
<td>0.308***</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>-0.089</td>
<td>-0.070</td>
<td>-0.090</td>
<td>0.020</td>
<td>0.060</td>
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<tr>
<td></td>
<td>Q4</td>
<td>0.020</td>
<td>-0.012</td>
<td>0.023</td>
<td>-0.035</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>0.180</td>
<td>-0.025</td>
<td>0.201</td>
<td>-0.226***</td>
<td>-0.221***</td>
</tr>
<tr>
<td>Peru</td>
<td>Q1</td>
<td>0.035</td>
<td>0.105</td>
<td>0.034</td>
<td>0.071</td>
<td>0.061</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>0.130</td>
<td>0.104</td>
<td>0.131</td>
<td>-0.027</td>
<td>-0.050</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>0.199</td>
<td>0.278</td>
<td>0.196</td>
<td>0.081</td>
<td>0.088*</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>0.268</td>
<td>0.181</td>
<td>0.273</td>
<td>-0.092</td>
<td>-0.081*</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>0.388</td>
<td>0.192</td>
<td>0.398</td>
<td>-0.206***</td>
<td>-0.183***</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Q1</td>
<td>0.009</td>
<td>0.378</td>
<td>-0.005</td>
<td>0.383***</td>
<td>0.562***</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>0.182</td>
<td>0.314</td>
<td>0.17</td>
<td>0.144***</td>
<td>0.141***</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>0.286</td>
<td>0.258</td>
<td>0.291</td>
<td>-0.033</td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>0.358</td>
<td>0.338</td>
<td>0.363</td>
<td>-0.025</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>0.461</td>
<td>0.275</td>
<td>0.521</td>
<td>-0.246***</td>
<td>-0.149***</td>
</tr>
<tr>
<td>Dom. Rep.</td>
<td>Q1</td>
<td>-0.363</td>
<td>-0.194</td>
<td>-0.388</td>
<td>0.194***</td>
<td>0.182***</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>-0.32</td>
<td>-0.087</td>
<td>-0.373</td>
<td>0.286***</td>
<td>0.282***</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>-0.191</td>
<td>-0.088</td>
<td>-0.226</td>
<td>0.138***</td>
<td>0.154***</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>-0.08</td>
<td>-0.024</td>
<td>-0.103</td>
<td>0.078***</td>
<td>0.120***</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>0.167</td>
<td>0.038</td>
<td>0.204</td>
<td>-0.166***</td>
<td>-0.118***</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

Source: Author's calculations based on household surveys

30 It must be noted that the calculation of saving rates is plagued by problems of under-reporting of both expenditures and income. The fact that the gravity of these problems varies across the household surveys of different countries is reflected in the large variance of saving rates across countries – e.g. in the case of El Salvador the under-reporting of expenditures is likely to be more serious than that of income, which is reflected in excessively high saving rates. For this reason, we focus on within-country comparisons, both across income quintiles and between recipients and non-recipients.
As for the differences between recipients and non-recipients, in the six countries recipients in lower income quintiles exhibit higher saving rates than non-recipients (column 4). However, these differences tend to diminish and become negative for households located higher up in the income distribution. The same pattern is obtained when these differences are calculated in a regression framework, after controlling for other household characteristics, by adding to equation (1) a set of interactives between \( R_i \) and the income quintile “dummy” variables. Estimates for these interactives are reported in the last column of table 4.1. Once again, the results suggest that saving rates tend to increase for poorer remittances receiving households, but they tend to decrease for better-off households. One possible interpretation of this finding is that for those in the lower quintiles remittances operate more as an ex-ante risk coping mechanism, while for those located in the upper quintiles remittances become significant after the corresponding households have been hit by negative income shocks which have reduced their saving capacity. Moreover, as mentioned above, it is also possible that the number of absent income generating migrants is larger among richer households.

It must be noted, however, that the fact that some remittance recipients save less than other households with similar characteristics does not necessarily imply that they consume the income from remittances entirely (i.e. that their saving rate is not positive). By itself, that result suggests only that the propensity to save out of the remittances income is lower than the corresponding saving rate from non-remittances income. Indeed, as described in equation (2) below, the observed saving rate of recipient households can be expressed as a weighted average of the saving rates for those two sources of income.

\[
S_2 = \frac{[Y_{r} - C_r] + (Y_{nr} - C_{nr})}{Y} = W_r S_r + W_{nr} S_{nr}
\]

where \( S_i \) and \( W_i \) are respectively the saving rate out of income source \( i \) and the share in total income of that source, and the indexes \( r \) and \( nr \) denote remittances and non-remittances income respectively. Assuming that the saving rate out of non-remittances income is equal to the saving rate of non-recipients \( (S_r = S_{nr}) \), equation (2) implies that the difference between the savings of recipients and non-recipients \( (S_2 - S_i) \) will be positive (negative) if and only if \( S_r \) is larger (smaller) than \( S_{nr} \). In this framework, in order to determine the value of \( S_r \) after having estimated \( S_2 - S_i \), one needs to apply the following transformation:

\[
S_r = S_{nr} + \frac{(S_2 - S_i)}{W_r}
\]

Figure 4.2 reports saving rates out of remittances income calculated on the basis of equation (3), using estimates of \( (S_2 - S_i) \) obtained either from the differences in means between the samples of recipients and non-recipients (darker bars), or those derived from regressions that control for income quintile and other household characteristics (brighter bars). The figure also reports, for comparison purposes, the observed total saving rates for those receiving remittances \( (S_2) \). In almost all cases, our estimates of \( S_r \) are positive, suggesting that recipients do not spend remittances entirely (the only exception is Peru, when household characteristics are controlled for). Overall, the result that recipient households tend to save a positive fraction of their remittances income – even if the saving rate is lower than that for non-remittances income – is consistent with the findings of the previous chapter regarding the positive impact of remittances on domestic investment and growth.
III. Remittances and Household Expenditures

Household savings have sometimes been defined in a broader sense, including not only the fraction of income which is not spent (as the in the previous section), but also the one that is destined to expenses that are likely to include important saving components, such as those in consumer durables, education and health. One problem with such an approach is the fact that it requires making the strong assumption that none of the above expenditures are associated with current consumption – i.e. they can be entirely considered an investment in future consumption. For this reason, rather than computing saving rates defined in such a broader fashion, and comparing them by remittances recipient status – as in the previous section – we next examine the composition of household expenditures directly, trying to uncover evidence on whether remittance recipients destine a different share of their total expenditures to items which are likely to embody a considerable saving component – education, health, and consumer durables.

Only a few previous studies have addressed the links between remittances and patterns of household expenditure. Using data on rural Mexico and controlling for observable household characteristics, Taylor (1992) has found that remittances recipient families tend to invest more in farm assets (e.g. livestock). Similarly, Adams (2005) has shown that with respect to their non-recipient counterparts, Guatemalan families reporting remittances tend to spend a lower share of total income in food and other non-durable goods, and more on durable goods, housing, education, and health.

Most of the surveys used in this report – 7 out of 11 – include detailed information on household expenditures, which can then be classified in several standard expense categories, e.g. food, consumer durables, etc. While our surveys lack information on how the income of

31 See Attanasio and Szekely (2000).
remittances is spent, the fact that money is fungible would render the utility of that sort of information quite limited anyway. Thus, to assess the extent to which remittances alter expenditures, we proceed by focusing on the share of different expenditure categories and comparing them across recipients and non-recipients which share similar demographic characteristics and are located in the same quintile of the household income distribution (prior to migration). We thus estimate models like the one shown in equation (1), but using as dependent variables the share in total expenditures of expenses in food, other consumer durables, non-durables (without housing), housing, education and health.\(^\text{32}\)

Figures 4.3 and 4.4 below show the expenditures patterns of recipient and non-recipient households, respectively, in rural and urban areas. As is apparent in these figures, in all countries the share of food and other non-durable consumption goods tends to be higher in rural than in urban areas, and the opposite is true for expenses in durable goods (including housing), education and health. Moreover, figures 4.1 and 4.2 show that both in urban and in rural areas, the households that report receiving remittances on average spend less than the rest in food, but they spend more in durables goods, housing investments, education and health.\(^\text{33}\)

**Figure 4.3. Expenditure Patterns by Remittance Recipient Status – Rural Regions**

![Image of bar chart showing expenditure patterns by remittance recipient status in rural regions.]

Source: Author's calculations based on household surveys

While this preliminary evidence suggests that remittances tilt consumption patterns towards higher investments in physical and human capital, it does not necessarily imply a causal relationship from remittances to consumption patterns. Indeed, a third type of factor – e.g. income and demographics – could be driving both access to remittances and the distribution of household expenditures across different goods and services. To check whether this is indeed the case, we have estimated the impact of remittances on the above mentioned expenditure shares in the context of regression models that control for household and location characteristics – e.g.

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\(^{32}\) The controls are the same as in equation (1).

\(^{33}\) The only exceptions are given by the lower expenditures in durable goods of remittances recipients in Peru (compared to non-recipients), the lower share of housing expenditures in urban Mexico, and by the lower share of educational expenses among remittances recipients in Mexico and rural Jamaica.
household composition, educational levels, home ownership, quintile of the income distribution, relative importance of agricultural activities in the area, etc. Using this approach, table 4.2 reports the impact of remittances on expenditure shares for the seven countries on which the necessary data is available. With the only exception of Jamaica, we find that remittances' recipients direct a smaller share of their total expenditures towards food, thus suggesting that Adams' (2005) findings for Guatemala also apply to other LAC countries with considerable remittances receipts. While the estimates reported in table 4.2 are at the national level, separate estimates for rural and urban areas suggest that the changes in expenditure patterns are somewhat larger in rural areas.

**Figure 4.4. Expenditure Patterns by Remittance Recipient Status – Urban Regions**

The complement of the reduction in food expenditures among remittances recipients is an increase in expenses in non-durable goods, durable goods, housing, education and health. The relative importance of these various increases, however, varies considerably across countries. Thus, changes in non-durable goods consumption (excluding food) are significant only in Peru, El Salvador, and Guatemala. Moreover, only in the two latter countries and in Mexico and Jamaica does the share of durable goods increase significantly among remittances recipients, and more frequent housing improvements are apparent only El Salvador and Jamaica, with the opposite effect found for Mexico. Increases in health expenditures, however, are present in 6 out of 7 countries (the exception being Nicaragua). Finally, higher educational expenditures are found for 4 out of 7 countries, with the opposite result found for Jamaica, and non-significant effects obtained for Mexico and Nicaragua.

Relatively similar results – reductions in food shares compensated by increases in non-durables, durables, health and education – are obtained when the per capita amount of remittances received by each household is taken into account, and when the possible endogeneity

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34 In the case of Mexico, food expenses cannot be separated from those in other non-durable goods, which are lower among recipients. The regressions for Jamaica control for quintiles in expenditure rather than income per capita.
of remittances is controlled for. However, to the extent that savings and expenditure patterns vary with income – see previous section – the above estimates of averages effects on all remittances recipients may be misleading, in the sense that they could mask possible differences across households located in different parts of the income distribution. To investigate these possible differences, we allow the impact of remittances on household behavior to vary across quintiles of the distribution of per capita household income. Moreover, in order to also capture the possible effect of remittances on expenditures that operates through increases in household income, we classify remittances recipients according to the income that they were estimated to have earned prior to migration (see chapter 3). The results, reported in table 4.3, indicate that remittances effects are quite different across segments of the income distribution, and they also vary considerably across countries.

Table 4.2. Access to Remittances and Expenditure Shares (OLS, differences with respect to non-recipient households)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Food</th>
<th>Non-Durables</th>
<th>Durables</th>
<th>Housing</th>
<th>Education</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico¹</td>
<td>-0.031***</td>
<td>N/A</td>
<td>0.014***</td>
<td>-0.006**</td>
<td>0.003</td>
<td>0.021***</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td></td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>-0.038***</td>
<td>0.008**</td>
<td>0.002*</td>
<td>0.001**</td>
<td>0.019***</td>
<td>0.006***</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.003)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>-0.034***</td>
<td>0.010*</td>
<td>0.006**</td>
<td>0.000</td>
<td>0.009***</td>
<td>0.009*</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.005)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Peru²</td>
<td>-0.043***</td>
<td>0.024***</td>
<td>-0.006</td>
<td>-0.001</td>
<td>0.006**</td>
<td>0.016***</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.007)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>-0.014*</td>
<td>-0.002</td>
<td>0.000</td>
<td>0.003</td>
<td>0.008</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.006)</td>
<td>(0.001)</td>
<td>(0.003)</td>
<td>(0.005)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Jamaica³</td>
<td>-0.002</td>
<td>-0.007</td>
<td>0.004***</td>
<td>0.003**</td>
<td>-0.005*</td>
<td>0.009***</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.003)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Dominican Republic³</td>
<td>-0.013***</td>
<td>-0.002</td>
<td>0.000</td>
<td>0.000</td>
<td>0.003*</td>
<td>0.012***</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.003)</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.
¹ Food and other non-durable goods together.
² Only urban areas.
³ Coefficients for housing in Jamaica and Dominican Republic are multiplied by 10.

Source: Author’s calculations based on household surveys

In the case of Mexico, for instance, remittances recipients in the lower quintiles exhibit a pattern that is similar to the one observed for the population as a whole. Indeed, they increase expenditures in durable goods, housing and human capital, mainly at the expense of non-durables. In contrast, their richer counterparts exhibit higher expenses in non-durable goods and lower expenditures in housing improvements and education. These results would suggest that, at

³⁵ The following instrumental variables are used for remittances: the percentage of households that receive remittances in the respective county of residence (a proxy for the presence of migrant networks), and its interaction with household level characteristics that affects the decision to migrate, including among them an indicator for the presence of 0-5 years old children in the household, the number of adult males in the household, and the average educational level among adults.
least in Mexico, remittances are used in a more productive way by poorer households. Arguably, remittances have the effect of relaxing budget constraints that limit the housing and human capital investments of poorer families. For richer households, on the other hand, the results suggest that the above budget constraints are not binding, so that remittances have the effect of increasing consumption of food and non-durable goods. This is illustrated in figure 4.5, which shows that in Mexico recipients in the first quintile experience a reduction in food and non-durable goods expenses and an increase in educational expenditures in comparison with non-recipients of similar characteristics, but both changes tend to become smaller — and even have their signs inverted — as one moves up in the income distribution.

### Table 4.3. Remittances and Expenditure Shares by Counterfactual Household Income Quintiles

<table>
<thead>
<tr>
<th>Country</th>
<th>Coefficient</th>
<th>Food</th>
<th>Non-Durables</th>
<th>Durable</th>
<th>Housing</th>
<th>Education</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>-0.063**</td>
<td>N/A</td>
<td>0.016*</td>
<td>0.013**</td>
<td>0.020*</td>
<td>0.015**</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.028</td>
<td>N/A</td>
<td>0.000</td>
<td>-0.027**</td>
<td>-0.005</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.036*</td>
<td>N/A</td>
<td>0.008</td>
<td>-0.023**</td>
<td>-0.025*</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.045**</td>
<td>N/A</td>
<td>-0.012</td>
<td>-0.020**</td>
<td>-0.024*</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.074**</td>
<td>N/A</td>
<td>-0.022</td>
<td>-0.020**</td>
<td>-0.051**</td>
<td>0.019</td>
<td></td>
</tr>
<tr>
<td>El Salvador</td>
<td>-0.004</td>
<td>-0.011</td>
<td>0.012***</td>
<td>0.004</td>
<td>-0.003</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.040***</td>
<td>0.018</td>
<td>-0.007*</td>
<td>0.001</td>
<td>0.026**</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.046***</td>
<td>0.036**</td>
<td>-0.013***</td>
<td>0.000</td>
<td>0.029*</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.045***</td>
<td>0.030**</td>
<td>-0.014**</td>
<td>-0.004</td>
<td>0.023**</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.022*</td>
<td>0.001</td>
<td>-0.011**</td>
<td>-0.003</td>
<td>0.030**</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>Guatemala</td>
<td>-0.050***</td>
<td>0.040*</td>
<td>0.006*</td>
<td>0.016</td>
<td>-0.015**</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.003</td>
<td>-0.007</td>
<td>0.003</td>
<td>-0.018</td>
<td>0.014**</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
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<td>-0.031</td>
<td>0.006</td>
<td>-0.015</td>
<td>0.025**</td>
<td>0.019</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.016</td>
<td>-0.046**</td>
<td>-0.005</td>
<td>-0.015</td>
<td>0.031**</td>
<td>0.019</td>
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<tr>
<td>Remittances</td>
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<td>-0.002</td>
<td>-0.019</td>
<td>0.026**</td>
<td>-0.007</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>0.003</td>
<td>0.012</td>
<td>-0.004</td>
<td>-0.013**</td>
<td>-0.003</td>
<td>-0.008</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.078</td>
<td>0.044</td>
<td>0.002</td>
<td>0.018*</td>
<td>0.008</td>
<td>0.024</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.057</td>
<td>0.066</td>
<td>0.003</td>
<td>0.013**</td>
<td>0.020</td>
<td>0.027**</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.055</td>
<td>0.015</td>
<td>0.003</td>
<td>0.016**</td>
<td>0.004</td>
<td>0.032**</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.018</td>
<td>-0.001</td>
<td>-0.014**</td>
<td>0.004</td>
<td>0.015</td>
<td>0.018</td>
<td></td>
</tr>
<tr>
<td>Nicaragua</td>
<td>0.056*</td>
<td>-0.013</td>
<td>0.007</td>
<td>-0.002</td>
<td>-0.041**</td>
<td>-0.008</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.057</td>
<td>0.008</td>
<td>0.000</td>
<td>0.003</td>
<td>0.033*</td>
<td>0.009</td>
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</tr>
<tr>
<td>Remittances</td>
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<td>0.003</td>
<td>0.003</td>
<td>0.050**</td>
<td>0.023</td>
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</tr>
<tr>
<td>Remittances</td>
<td>-0.074**</td>
<td>0.018</td>
<td>-0.009</td>
<td>0.005</td>
<td>0.042**</td>
<td>0.017</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.067***</td>
<td>0.006</td>
<td>-0.015</td>
<td>0.007</td>
<td>0.064**</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>Jamaica</td>
<td>-0.026**</td>
<td>0.019*</td>
<td>0.007***</td>
<td>-0.001</td>
<td>-0.010</td>
<td>0.005*</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.021</td>
<td>-0.024*</td>
<td>-0.001</td>
<td>0.003</td>
<td>0.004</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.025*</td>
<td>-0.023**</td>
<td>-0.001</td>
<td>0.004*</td>
<td>0.005</td>
<td>-0.002</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.039**</td>
<td>-0.035**</td>
<td>-0.010**</td>
<td>0.006</td>
<td>-0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.033</td>
<td>-0.052***</td>
<td>0.003</td>
<td>0.006</td>
<td>0.011</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>-0.016</td>
<td>0.024**</td>
<td>0.001</td>
<td>0.005</td>
<td>-0.010</td>
<td>0.000</td>
<td></td>
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<tr>
<td>Remittances</td>
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<td>-0.013</td>
<td>0.004</td>
<td>-0.001</td>
<td>0.013*</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.018</td>
<td>-0.023*</td>
<td>0.002</td>
<td>-0.008</td>
<td>0.010</td>
<td>0.030*</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.005</td>
<td>-0.027**</td>
<td>-0.002</td>
<td>-0.006</td>
<td>0.015*</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>0.028</td>
<td>-0.042***</td>
<td>-0.006***</td>
<td>-0.004</td>
<td>0.017**</td>
<td>0.005</td>
<td></td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

1 Food and other non-durable goods together.
2 Only urban areas.
3 Coefficients for housing in Jamaica and Dominican Republic are multiplied by 10.
Source: Author's calculations based on household surveys
In the remaining countries under analysis, however, a quite different pattern is observed across poorer and richer households. Thus, with the only exception of Jamaica, whenever remittances are found to significantly increase educational and health expenditures of recipient households, the effects are restricted to those in the upper quintiles of the income distribution. For those richer families, higher human capital investments are achieved through lower expenditures in non-durable (3 out of 7 countries) as well as durable goods (4 out of 7 countries). Poorer recipient households, on the other hand, are found to reduce expenditures in education in Nicaragua and Guatemala, and they exhibit higher expenditures in non-durables in the Dominican Republic, Jamaica and Guatemala. The contrast with the Mexican case can be well illustrated by the pattern observed in Nicaragua – where as seen before, individuals tend to be positively selected into migration as opposed to the negative pattern described in chapter 1 for Mexico. As seen in figure 4.6, a pattern of reduction in food and non-durable expenses with an increase in educational expenditures is also found among remittances recipients in Nicaragua, but that pattern is restricted to those in higher quintiles of the income distribution, as opposed to the lower quintiles in the case of Mexico. Moreover, an opposite pattern is obtained for poorer Nicaraguan recipients: relatively lower educational expenses and higher expenditures in food and non-durables.

**Figure 4.5. Expenditure in Non-Durables (including food) and Education by Remittance Recipient Status and Counterfactual Income Quintile: Mexico**

Overall, our results indicate that except for the case of Mexico, remittances only have the beneficial effect of changing consumption patterns towards higher educational and health expenditures among middle and upper class households. Among those in the lower quintiles of the income distribution, the results tend to confirm the popular perception that remittances tend to tilt household expenditures mainly towards non-durable goods, with some effects on durable consumption, but limited impact on housing and human capital investments. Putting this together with the results on the effect of remittances on savings – previous section – the evidence indicates that poorer recipient households save a positive fraction of their remittances income, but they do not increase the share of their expenditures in saving-intensive items – physical and human capital assets. Richer recipients, on the other hand, tend to lower their saving rates in
comparison with non-recipients but they alter their expenditure patterns in the direction of goods and services with a high saving component.

Figure 4.6. Expenditure in Non-Durables (including food) and Education by Remittance Recipient Status and Counterfactual Income Quintile: Nicaragua

Source: Author’s calculations based on household surveys

IV. Remittances and Human Capital

Educational Attainment

While remittances can help overcome borrowing constraints that limit the human capital investments of poor households, the migration of household members that precedes the receipt of remittances can also have disruptive effects on family life, with potentially negative consequences on the educational attainment of children. Moreover, to the extent that in destination countries most migrants tend to work in occupations requiring limited schooling, the returns from investments in education may be lower for those that are envisaging international migration, which also could tend to reduce the schooling of children in migrants’ families.

Existing evidence on the impact of remittances on education in LAC is restricted to the cases of Mexico and El Salvador. For rural Mexico, Hanson and Woodruff (2003) find that remittances are associated with higher educational attainment, at least among 10-15 year old girls whose mothers have low levels of schooling. Using a cross section of Mexican municipalities, Lopez-Cordova (2005) shows that remittances are associated with lower illiteracy among children, but the evidence on their impact on school attendance is mixed: the effect is positive only for 5-year olds, becoming insignificant among 6-14 years old and negative for those aged 15 to 17. Similarly, McKenzie and Rapoport (2005) show that Mexican children aged 16 to 18 pertaining to households with migrants exhibit lower levels of educational attainment, and that this negative effect is even larger for those whose mothers have higher levels of schooling. For the case of El Salvador, Cox-Edwards and Ureta (2003) and Acosta (2006) show that children
from remittance recipient households are less likely to drop out of school, which they attribute to the relaxation of budget constraints affecting poor recipient households.

In the present section we investigate the extent to which previous findings on the impact of remittances on educational attainment also apply to other countries with significant remittances flows. Disparities in secondary enrollment rates are large in the LAC region, ranging from about 80 percent in countries such as Chile and Argentina, to less than 50 percent in high remittances recipient countries such as Mexico, El Salvador, the Dominican Republic, Nicaragua, Honduras and Guatemala. Moreover, as seen in figure 4.7, the above mentioned countries, together with Haiti, exhibit among the lowest adult educational attainment rates in the region. That remittances could potentially have an important effect on education is illustrated by the comparison of enrollment rates among children aged 12 to 17 across recipient and non-recipient households (see figure 4.8). With the only exception of Mexico, children from families reporting remittances are more likely to stay at school. The largest differences are obtained for Nicaragua, Guatemala and Honduras, where enrollment rates are between 12 and 17 percent higher for recipient families.

**Figure 4.7. Average Years of Education for Adults (22-65 years old)**

![Image of a bar chart showing average years of education for adults in different countries.](Image)

Source: Author’s calculations based on household surveys.

**Figure 4.8. Differences in School Enrollment Rates for 12-17 years old by Remittances Recipient Status**

![Image of a bar chart showing differences in school enrollment rates by country and remittance recipient status.](Image)

Source: Author’s calculation based on household surveys

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Some of these differences, however, could be attributed to the fact that, as shown in chapter 1, households that report remittances exhibit considerably different demographic and income characteristics than non-recipients. We thus estimate regression models that attempt to deal with this problem, using a specification that closely follows Hanson and Woodruff's (2003), and focus on the accumulated schooling of children aged 10 to 15. The models, which follow equation (4) below, are estimated separately by gender, and urban and rural areas whenever possible (provided sufficient variability in remittances’ receipts is available).

\[ E_i = \alpha + \beta X_i + \gamma M_i + \lambda C_i + \delta R_i + \epsilon_i \]  

where \( E_i \) represents the number of school grades completed by child \( i \), \( X_i \) is a vector of child and household characteristics (age of the child, a dummy for the child being the oldest in the household, indicators for the number of children of different ages in the household, presence of a 0-5 year old child, family home ownership, counterfactual income quintile), \( M_i \) is a set of characteristics of the child’s mother (indicators for mother’s education, mother’s marital status, mother’s head of household status, and a quartic in mother’s age), \( C_i \) represent community characteristics (the proportion of households with sanitary services in the county of residence, the proportion of household heads working in agricultural activities in the county of residence, and state/province indicators), \( R_i \) is a “dummy” variable for households that receive remittances, and \( \epsilon_i \) is a random error. Regression estimates for the \( \delta \) coefficient are presented in table 4.4.

Our results suggest that access to remittances is positively and significantly associated with higher educational attainment in 6 out of 11 countries—the exceptions being Mexico, Paraguay, Peru, Jamaica and the Dominican Republic. The estimated positive impact of remittances varies by gender and across rural and urban areas—e.g. in Ecuador an impact is found only for urban areas. Since the actual amount remitted is likely to have a differential impact depending on the magnitude of the transfer, we have also replicated this analysis looking at the impact of the per capita value of remittances received by the household. The results suggest that higher remittances also increase schooling in the Dominican Republic, and among boys in urban Mexico.\(^{36}\)

Previous evidence on Mexico has suggested that the positive effects of remittances on schooling vary with the educational attainment of the children’s parents, being generally larger when the latter are low. Differential effects of this sort could be due to the fact among poorer families—with lower levels of adult schooling—remittances could have a more sizable effect in terms of relaxing budget constraints that keep children out of school. However, one could also expect an opposite effect—remittances having a smaller impact on education when the schooling

\(^{36}\) A potential methodological concern associated with the above results is that unobserved household characteristics that affect their propensity to have migrants and receive remittances could also be driving the decisions to keep children in school. We have attempted the use of instrumental variables to address this simultaneity bias, but have failed to find appropriate instruments that are sufficiently correlated with the migration status of households but do not otherwise affect the educational attainment of children. While the instruments used in other sections of this chapter—the fraction of households that receive remittances in the county and its interaction with household characteristics—have passed standard specification tests, the fact that the size of the sample of children aged 10 to 15 is much smaller than in other sections, has led coefficients and standard errors to increase considerably in comparison with ordinary least squares, leading us to focus on the latter.
of parents is low – if less educated parents exhibit lower preferences for educational over other alternative expenditures. To find out which effect dominates, we re-estimate equation (4) adding an interaction term between remittances ($R_i$) and a variable that indicates whether the mother has four of more years of education. The corresponding results are reported in table 4.5.

**Table 4.4. Access to Remittances and Children Education - OLS**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Age Group</th>
<th>Accumulated Schooling</th>
<th>OLS 10-15 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.482***</td>
<td>0.149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.113</td>
<td></td>
<td></td>
</tr>
<tr>
<td>El Salvador</td>
<td>0.448**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.427***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honduras</td>
<td>0.187</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paraguay</td>
<td>-0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haiti</td>
<td>0.098</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.195</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>-0.070</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.195</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicaragua 1</td>
<td>0.437***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.135</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jamaica 1</td>
<td>-0.114</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominican Republic 1</td>
<td>0.077</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.107</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level.
* Significant at 10% level. 1 Rural and Urban areas together.
Source: Author's calculations based on household surveys

Our findings confirm those of previous papers on Mexico, suggesting that the positive effect of remittances on education tends to be larger when the schooling of parents is low. For instance, among rural girls in Mexico, Paraguay and Peru,\(^{37}\) our previous results suggested no effect of remittances on educational attainment but we now find a positive and significant effect for those whose mother have at most three years of educational attainment, whereas for the remaining children the effect is estimated to be close to zero – although slightly negative in Mexico and Paraguay. Similarly, in Guatemala and Honduras, some of the previously estimated positive effects of remittances are now found to be larger in magnitude for children with

\(^{37}\) In the case of Peru, the sample includes both urban and rural children.
uneducated mothers and considerably smaller for those whose mothers have at least four years of schooling.

Table 4.5. Remittances and Children Education by Mother’s Education

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Variable</th>
<th>10-15 Years Old</th>
<th>15-19 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>Mexico</td>
<td>Receive Remittances</td>
<td>-0.082</td>
<td>0.329**</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>(0.240)</td>
<td>(0.166)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>Receive Remittances</td>
<td>0.511***</td>
<td>0.251**</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>0.129</td>
<td>0.115</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Receive Remittances</td>
<td>0.482**</td>
<td>0.223</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>0.200</td>
<td>0.186</td>
</tr>
<tr>
<td>Honduras</td>
<td>Receive Remittances</td>
<td>0.581***</td>
<td>0.662***</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>0.142</td>
<td>0.155</td>
</tr>
<tr>
<td>Ecuador</td>
<td>Receive Remittances</td>
<td>0.278</td>
<td>-0.106</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>0.233</td>
<td>0.237</td>
</tr>
<tr>
<td>Paraguay</td>
<td>Receive Remittances</td>
<td>0.056</td>
<td>0.433*</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>(0.374)</td>
<td>0.345</td>
</tr>
<tr>
<td>Haiti</td>
<td>Receive Remittances</td>
<td>0.043</td>
<td>0.273**</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>0.229</td>
<td>-0.111</td>
</tr>
<tr>
<td>Peru</td>
<td>Receive Remittances</td>
<td>0.187</td>
<td>0.393***</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>-0.362</td>
<td>-0.343*</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Receive Remittances</td>
<td>0.577**</td>
<td>0.554**</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>-0.208</td>
<td>-0.296</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Receive Remittances</td>
<td>0.510</td>
<td>-0.236</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>-0.566</td>
<td>0.253</td>
</tr>
<tr>
<td>Dom. Rep.</td>
<td>Receive Remittances</td>
<td>-0.148</td>
<td>0.301</td>
</tr>
<tr>
<td></td>
<td>Mother Educ 4 Years or More</td>
<td>0.282</td>
<td>-0.242</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

Source: Author’s calculations based on household surveys

Overall, with the addition of Paraguay and Peru to the list of countries where remittances affect educational attainment, we are left with only two countries (Jamaica and the Dominican Republic) in which those effects are always non-significant. As for the differences by gender and urban status, our estimation results do not allow easy generalizations and suggest that the various
potential effects of migration and remittances — relaxation of budget constraints, social
disruption, changes in the returns of schooling — carry different relative weights depending on
the country and socio-economic group involved. In any case, it appears that remittances tend to
relax budget constraints that otherwise would force children to leave school and reduce their
educational attainment, but this effect is sometimes restricted to those with less educated
mothers.

Health Outcomes

Few papers have addressed the impact of migration and remittances on child health. The
exceptions are mostly focused on infant mortality. Brockerhoff (1990) and Ssengonzi, De Jong
and Stokes (2002) investigate the effects of female migration on the survival chances of their
children in Senegal and Uganda, respectively. They find that rural to urban migration
significantly increases child survival chances. Kanaiaupuni and Donato (1999) analyze the
effects of village migration and remittances on infant survival outcomes in Mexico, and conclude
that remittances reduce infant mortality. However, the authors reach an opposite conclusion for
the effect of migration: higher rates of infant mortality in communities experiencing intense
migration. Finally, with data on Mexican municipalities Lopez-Cordova (2006) concludes that
larger proportions of remittances and migrant households at the community level are associated
with lower infant mortality rates.

Further evidence on the impact of migration on child health has been provided by
Hildebrandt and McKenzie (2006). The authors investigate the impact of international migration
on several children health outcomes in Mexico. Their results show that migrant households have
lower rates of infant mortality and higher birth weights. Moreover, they find evidence that
migration also raises maternal health knowledge and the likelihood that the child was delivered
by a doctor. On the other hand, preventative health care (such as breastfeeding, visits to doctors,
and vaccinations) seem to be less likely for children from migrant households.

No previous study has investigated the impact of remittances and migration on
anthropometric indicators for young children (weight-for-age, height-for-age). Hoddinot and
Kinsey (2001) present results on how external shocks drastically affect child growth in
developing countries. Both weight and height measures are good indicators of health status, with
different consequences in the short run and long run. For instance, lower weight is associated
with malnutrition and higher mortality risk. Similarly, lower stature in childhood is strongly
correlated with lower body size in adulthood, with negative consequences on earnings and
productivity (Thomas and Strauss, 1997), and increased risk of cardiovascular and lung diseases.

With this motivation, the present section aims at uncovering evidence on the effect of
international migrant remittances on anthropometric health indicators typically used in the health
literature, and with well known links with child growth. We also estimate the impact of
remittances on the probability that the delivery of children born in the year preceding the survey
was assisted by a doctor, and on the probability that children aged 2 to 5 received the complete
set of required vaccinations. The anthropometric measures on which focus are the Weight-for-
Age (WAZ) and Height-for-Age (HAZ) Z-Scores for children aged 1 to 5 years old. These are
standardized measures of performance in weight and height, and consist on comparing each child of a given age to a reference group. The reference tables for WAZ and HAZ are taken from the CDC Growth Charts for US (Kuczmaraki et al., 2000). In particular, the following formula is used for calculating the Z-Scores.

\[ Z = \frac{\left( \frac{X}{M} \right)^L - 1}{LS} \]  

where \( X \) is the measure of interest (weight, height) for the child, \( M \) is the median of the corresponding variable, \( S \) is the generalized coefficient of variation, and \( L \) is the power in the Box-Cox transformation taken from the CDC reference tables for a given age group. In order to avoid extreme values and outliers due to misreporting, we follow Hoddinott and Kinsey’s (2001) recommendation to drop children with z-scores greater than 6 or lower than -6. As the original reference tables account for children with 1.5, 2.5, 3.5, etc. months, in order to match our data the reference months are rounded up (i.e., 1.5 month in the reference table are equal to 2 months).

Figures 4.9 and 4.10 show the distribution of weight-for-age and height-for-age anthropometric z-scores, using kernel density estimation, for the cases of Guatemala and Nicaragua, the only two LAC countries in which the household surveys used in this report provide the information needed for calculating the health indicators employed in this section. Plot densities of the above described anthropometric indicators for children aged 1-5 years old from remittance recipient and non-recipient households are estimated using kernel densities. The figures show that children from recipient households have both higher weight-for-age and height-for-age z-scores. Kolmogorov-Smirnov tests for equality of distributions reject the equality of distributions for recipient and non-recipient households, and suggest that remittances are in fact associated with better children anthropometric scores.

In order to test whether these results are driven by the differential characteristics of households with and without migrants, we estimate a regression model similar to the one used for educational attainment (equation 4), changing only the dependent variable, from years of schooling to the four health indicators measured above. In addition to this basic specification, we estimate a modified version of equation (4), where the indicator for remittances recipients is interacted with a dummy variable for the second quintile of the income distribution – using the counterfactual income prior to migration – and a dummy for households located in the third to fifth quintiles.

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38 Reference Tables can be found at [www.cdc.gov/nchs/about/major/nhanes/growthcharts/datafiles.htm](http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/datafiles.htm)

39 For WAZ, the original tables used are the "Weight-for-age charts, birth to 36 months", for children from 0 up to 36 months. For older children, values where extrapolated using the "Weight-for-age charts, 2 to 20 years". Similarly, for HAZ the reference tables used are "Lenght-for-age charts, birth to 36 months", for children from 0 up to 36 months, and "Stature-for-age charts, 2 to 20 years", for older children.

40 We group the 3rd through 5th quintiles due to the relatively small sample size for some of the estimations.
Table 4.6 reports the corresponding results, including the coefficients on free-standing dummy variables for the second through fifth income quintiles. As confirmed by our estimates, both weight- and height-for-age indexes tend to increase monotonically and significantly with household income, and so does the likelihood of doctor-assisted deliveries in the case of Nicaragua. Moreover, controlling for pre-migration income, children from households that report receiving remittances tend to exhibit higher health outcomes than those from non-recipients households with similar demographic and socio-economic characteristics. While the relatively small sample sizes make most of the estimated interactives between remittances and income quintiles non-significant from a statistical point of view, in most cases the results clearly indicate
that the impact of remittances on children health is concentrated on low income households located in the first quintile of the income distribution.

Table 4.6. Remittances and Health Outcomes

<table>
<thead>
<tr>
<th>Country</th>
<th>Dependent Variable</th>
<th>Guatemala</th>
<th>Nicaragua</th>
<th>Guatemala</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weight-for-Age Z-Score</td>
<td>Height-for-Age Z-Score</td>
<td>Received All Vaccines</td>
<td>Child Delivered by Doctor</td>
<td>Weight-for-Age Z-Score</td>
</tr>
<tr>
<td>2nd Income Quintile</td>
<td>0.117**</td>
<td>0.141**</td>
<td>0.011</td>
<td>0.006</td>
<td>0.154*</td>
</tr>
<tr>
<td></td>
<td>(0.058)</td>
<td>(0.060)</td>
<td>(0.011)</td>
<td>(0.015)</td>
<td>(0.085)</td>
</tr>
<tr>
<td>3rd Income Quintile</td>
<td>0.235***</td>
<td>0.385**</td>
<td>0.016</td>
<td>0.054***</td>
<td>0.077</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.067)</td>
<td>(0.013)</td>
<td>(0.025)</td>
<td>(0.099)</td>
</tr>
<tr>
<td>4th Income Quintile</td>
<td>0.325***</td>
<td>0.479***</td>
<td>0.010</td>
<td>0.263***</td>
<td>0.594***</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.076)</td>
<td>(0.016)</td>
<td>(0.023)</td>
<td>(0.117)</td>
</tr>
<tr>
<td>5th Income Quintile</td>
<td>0.594***</td>
<td>0.686**</td>
<td>0.026</td>
<td>0.352**</td>
<td>0.594***</td>
</tr>
<tr>
<td></td>
<td>(0.091)</td>
<td>(0.098)</td>
<td>(0.018)</td>
<td>(0.025)</td>
<td>(0.138)</td>
</tr>
<tr>
<td>Remittances</td>
<td>0.211**</td>
<td>0.213</td>
<td>0.065**</td>
<td>0.255***</td>
<td>0.306</td>
</tr>
<tr>
<td></td>
<td>(0.089)</td>
<td>(0.228)</td>
<td>(0.021)</td>
<td>(0.146)</td>
<td>(0.394)</td>
</tr>
<tr>
<td>Remittances*Q2</td>
<td>-0.327</td>
<td>0.084</td>
<td>-0.038</td>
<td>-0.034*</td>
<td>-0.370</td>
</tr>
<tr>
<td></td>
<td>(0.283)</td>
<td>(0.264)</td>
<td>(0.079)</td>
<td>(0.007)</td>
<td>(0.467)</td>
</tr>
<tr>
<td>Remittances*Q3-Q4-Q5</td>
<td>-0.423</td>
<td>0.004</td>
<td>-0.041</td>
<td>-0.036***</td>
<td>-0.252</td>
</tr>
<tr>
<td></td>
<td>(0.272)</td>
<td>(0.253)</td>
<td>(0.071)</td>
<td>(0.006)</td>
<td>(0.418)</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.
Source: Author's calculations based on household surveys

V. Remittances and Labor Supply

The impact of remittances on labor supply is in principle ambiguous. For individuals from households with migrants, the net additional income derived from remittances could have the "income effect" of increasing the demand for leisure and reservation wages, with a consequent reduction in labor force participation. However, out-migration also has the direct effect of reducing the size of the labor force, and the ensuing upward pressure on local wages could in turn create a "substitution effect" away from leisure, with a consequent increase in labor supply for those living in areas with high migration rates. In the case of Mexico, for instance, Mishra (2004) estimates that emigration raised average wages by 8% between 1970 and 2000. In addition to the above factors, in households with recent migrants the need to replace the income lost due to the migration of wage earners could reinforce the effect of higher market wages, resulting in an increase in the labor participation of stayers.

Previous papers on the subject suggest that remittances tend to reduce labor force participation in rural Mexico (Hanson, 2005) and El Salvador (Acosta, 2006), but they do not have a significant effect in Nicaragua (Funkhouser, 1992). In particular, Hanson finds that in Mexico, receiving remittances from abroad reduces both the likelihood of working outside the home and the hours worked by both males and females. While Hanson interprets the latter result as evidence of increasing intra-household specialization – e.g. remittances income allowing families to "buy back" some of the labor time of the women that stayed in Mexico – he implies that caution should be used when interpreting the result of a lower male labor supply in households with migrants. Indeed, despite Hanson's efforts to control for self-selection into
migration, individual unobserved characteristics could still be driving both the decision to stay in Mexico and that of supplying less labor outside the home.

In order to determine whether previous evidence can be generalized to other LAC countries, we explore household survey data for 11 LAC countries. In our sample, 88 percent of adult males aged 20 to 59 and 52 percent of females in that age group are either working or actively looking for a job. Labor force participation among males varies considerably across countries, from around 93 percent in Guatemala and Paraguay, to about 78 percent in Jamaica and Haiti. Among females, the largest rates are found in Haiti and Peru (about 62 percent), and the lowest in Honduras, Guatemala and Mexico (44 percent). As shown in figure 4.11, in almost all cases labor force participation is lower for individuals living in households with access to remittances, the only exceptions being found for females in Haiti and Nicaragua. The largest differences are obtained for Mexico, where nearly 90% of non-recipient males are working or looking for a job, while only 60% of their recipient counterparts are doing so – the corresponding rates for females are 45 and 34 percent, respectively. Differences by remittances recipient status in other countries are much smaller than in Mexico, but they still average 8 percent for males and 3 percent for females.

**Figure 4.11. Labor Force Participation of Adults (20-59 years old), by Gender and Remittance Recipient Status**

![Figure 4.11](image-url)

Source: Author’s calculations based on household surveys.

While these differences are considerable, they could be driven by individual and household characteristics associated with access to remittances and also with labor force participation decisions. To investigate whether this is indeed the case, we estimate regression models for hours worked outside the home, as well as for individuals’ decisions to participate in the labor market, including access to remittances among other determinants. In the case of hours we employ a “tobit” specification that takes into account the fact that many individuals do not participate in the labor market and thus report zero worked hours. In the case of the labor participation decision we employ a “probit” model which controls for the possible endogeneity of remittances using instrumental variables. When possible, we estimate separate regressions for
males and females, in urban and rural areas – the only exception being Peru, where recipients are almost absent in rural areas.\textsuperscript{41} The estimated models are of the following form.

\[
L_i = \alpha + \beta X_i + \gamma H_i + \delta R_i + \epsilon_i
\] (6)

where \(L_i\) represents either the number of hours worked by individual \(i\) or a dummy variable that takes the value one if he/she is active in the labor market (is either working or looking for a job), \(X_i\) is a vector of personal characteristics (a quartic in age, indicators for educational attainment, marital status), \(H_i\) is a set of household characteristics (household size and composition, home ownership, and state/province indicators), \(R_i\) is a “dummy” variable for households that receive remittances, and \(\epsilon_i\) is a random error. Results are presented in tables 4.7 and 4.8, respectively.

Table 4.7. Access to Remittances and Hours Worked

<table>
<thead>
<tr>
<th>Age Group</th>
<th>20-59 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td>Hours worked last week</td>
</tr>
<tr>
<td>Sample</td>
<td>Rural</td>
</tr>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td></td>
<td>(1.022)</td>
</tr>
<tr>
<td></td>
<td>(0.986)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>-0.969</td>
</tr>
<tr>
<td></td>
<td>(1.426)</td>
</tr>
<tr>
<td>Honduras</td>
<td>-3.052***</td>
</tr>
<tr>
<td></td>
<td>(0.704)</td>
</tr>
<tr>
<td>Ecuador</td>
<td>-2.186*</td>
</tr>
<tr>
<td></td>
<td>(1.264)</td>
</tr>
<tr>
<td>Paraguay</td>
<td>-15.395**</td>
</tr>
<tr>
<td></td>
<td>(7.247)</td>
</tr>
<tr>
<td>Haiti</td>
<td>-8.410***</td>
</tr>
<tr>
<td></td>
<td>(2.831)</td>
</tr>
<tr>
<td>Peru</td>
<td>-12.711***</td>
</tr>
<tr>
<td></td>
<td>(1.870)</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>-3.096</td>
</tr>
<tr>
<td></td>
<td>(1.889)</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>-5.278***</td>
</tr>
<tr>
<td></td>
<td>1.301</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1\% level. ** Significant at 5\% level. * Significant at 10\% level.
Source: Author’s calculations based on household surveys

\textsuperscript{41} Control variables include a quartic in age, indicators for years of education, marital status, indicators for the number of children of different ages in the household, presence of a 0-5 year old child, the number of adult males and females in the household, family home ownership, and state/province indicators. The sample is restricted to individuals aged 20 to 59. The instruments for remittances include the incidence of households with remittances in the county and its interaction with household level characteristics that affect the decision to migrate. The validity of the instruments is confirmed both in the first stage regressions and by means of Sargan’s over-identification tests.
Confirming previous evidence, our results suggest that in all the 10 countries for which data is available, remittances have the effect of reducing the number of hours worked per week. This negative effect is present both in urban and rural areas, the only exceptions being Paraguay and Haiti, where hours worked are reduced in rural areas only, and Nicaragua, where the estimated effect is significant in urban areas only. As for differences by gender, no clear generalizations are possible, with five out of ten countries showing larger effects among females and four exhibiting the opposite pattern.

Table 4.8. Remittances and Labor Force Participation (with instrumental variables)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>20-59 Years Old</th>
<th>Labor Force Participation (with instrumental variables)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample</td>
<td>Rural Males</td>
</tr>
<tr>
<td>Mexico</td>
<td>-0.329***</td>
<td>-0.245***</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>-0.087</td>
<td>-0.598***</td>
</tr>
<tr>
<td></td>
<td>(0.070)</td>
<td>(0.083)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.007</td>
<td>-0.095</td>
</tr>
<tr>
<td></td>
<td>(0.170)</td>
<td>(0.221)</td>
</tr>
<tr>
<td>Honduras</td>
<td>-0.006</td>
<td>-0.135**</td>
</tr>
<tr>
<td></td>
<td>(0.068)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>Ecuador</td>
<td>-0.228**</td>
<td>-0.154*</td>
</tr>
<tr>
<td></td>
<td>(0.090)</td>
<td>(0.085)</td>
</tr>
<tr>
<td>Paraguay</td>
<td>-0.009</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td>(0.092)</td>
<td>(0.174)</td>
</tr>
<tr>
<td>Haiti</td>
<td>0.254</td>
<td>0.338**</td>
</tr>
<tr>
<td></td>
<td>(0.164)</td>
<td>(0.165)</td>
</tr>
<tr>
<td>Peru</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicaragua</td>
<td>-0.181*</td>
<td>0.337</td>
</tr>
<tr>
<td></td>
<td>(0.099)</td>
<td>(0.208)</td>
</tr>
<tr>
<td>Jamaica</td>
<td>-0.047</td>
<td>-0.027</td>
</tr>
<tr>
<td></td>
<td>(0.051)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>-0.222**</td>
<td>-0.010</td>
</tr>
<tr>
<td></td>
<td>(0.092)</td>
<td>(0.126)</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level.
* Significant at 10% level.

Source: Author's calculations based on household surveys

Similar results are obtained for the decision to participate in the labor market using a "probit" model and assuming remittances to be exogenous. Indeed, such a model yields negative effects in 10 out of 11 countries – data is now available also for Jamaica – and the weakest results are obtained for Paraguay and Nicaragua (where significant results are restricted to urban areas), as well as for Haiti (where the effects are non-significant). However, when remittances are allowed to be endogenous and are appropriately instrumented, their negative impact on labor force participation ceases to be significant in a number of cases (table 4.8) – e.g. their impact on
Labor supply becomes non-significant in Guatemala as well as in urban areas in Mexico, Honduras, and the Dominican Republic. Moreover, in both Paraguay and Haiti, females living in urban areas are found to be more likely to participate in the labor force when receiving remittances, suggesting that the latter may be having a social disruption type of effect that in those cases dominates possible reductions in reservation wages.

Table 4.9. Remittances and Labor Force Participation, by Educational Levels (with instrumental variables)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Variable</th>
<th>20-59 Years Old</th>
<th>Labor Force Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rural Males</td>
<td>Rural Females</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>Receive Remittances</td>
<td>-0.434***</td>
<td>-0.283***</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.214***</td>
<td>0.059</td>
</tr>
<tr>
<td>El Salvador</td>
<td>Receive Remittances</td>
<td>-0.108</td>
<td>-0.623***</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.050</td>
<td>-0.072</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Receive Remittances</td>
<td>-0.037</td>
<td>-0.119</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.214</td>
<td>0.417*</td>
</tr>
<tr>
<td>Honduras</td>
<td>Receive Remittances</td>
<td>0.032</td>
<td>-0.148**</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>-0.067</td>
<td>0.022</td>
</tr>
<tr>
<td>Ecuador</td>
<td>Receive Remittances</td>
<td>-0.256</td>
<td>-0.158</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.035</td>
<td>0.006</td>
</tr>
<tr>
<td>Paraguay</td>
<td>Receive Remittances</td>
<td>-0.125</td>
<td>-0.231</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.167</td>
<td>0.469**</td>
</tr>
<tr>
<td>Haiti</td>
<td>Receive Remittances</td>
<td>0.029</td>
<td>0.463**</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.288*</td>
<td>-0.204</td>
</tr>
<tr>
<td>Peru</td>
<td>Receive Remittances</td>
<td>-0.458*</td>
<td>-0.748*</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>3.458*</td>
<td>-0.748*</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Receive Remittances</td>
<td>-0.366**</td>
<td>0.380</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.298**</td>
<td>0.093</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Receive Remittances</td>
<td>-0.133</td>
<td>-0.075</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.092</td>
<td>0.053</td>
</tr>
<tr>
<td>Dom. Rep.</td>
<td>Receive Remittances</td>
<td>-0.220*</td>
<td>-0.075</td>
</tr>
<tr>
<td></td>
<td>Receive Remittances * Educ 4+</td>
<td>0.001</td>
<td>0.104</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.
Source: Author’s calculations based on household surveys
One possible concern with the above results is that remittances may be expected to have very different effects on the labor supply decisions of individuals with different levels of skills. Indeed, for those with higher levels of schooling remittances income is likely to represent a smaller fraction of total income, so that income effects derived from remittances may be relatively less important than substitution effects associated with changes in labor market conditions – e.g. increases in wages as a result of out-migration. To test for this possibility, we have re-estimated the model underlying table 4.8 introducing an interactive between remittances and a “dummy” variable for individuals that have at least 4 years of schooling (table 4.9).

The findings reported in table 4.9 suggest that the reductions in labor supply caused by remittances tend to be much smaller among individuals with higher levels of schooling. Evidence in this respect is found in 8 out of 11 countries, the only exceptions being El Salvador, the Dominican Republic and Jamaica. Moreover, in the cases of rural females in Guatemala and Paraguay and rural males in Haiti, for those with at least 4 years of schooling the effect of remittances appears to be that of increasing labor supply, which is consistent with either social disruption effects or with changing labor market conditions that affect remittances recipients to a larger extent. However, although depending on the country the effects can be quite different across genders, between rural and urban areas and by levels of schooling, the overall conclusion from this section is that remittances are more likely to reduce and not increase labor supply.

VI. Remittances and Entrepreneurship

Despite the fact that remittances most often tends to reduce labor force participation, for those individuals who remain active in the labor market, remittances could potentially increase the range of available productive activities. Indeed, assuming that many would-be entrepreneurs are subject to credit constrains, one could expect remittances to provide the means for financing the opening or expansion of small businesses. There are, however, other factors which would lead to expect fewer business owners among remittances recipients.

First, if households with migrants tend to be smaller, the pool of non-paid family workers can end up being too small, thus making them less apt to undertake entrepreneurial activities. Second, since migration is an inherently risky activity – especially when illegal as it is frequently the case in Latin America – households may not want to combine it with (other) entrepreneurial activities, which are also intrinsically risky. Third, the creation of a new business can make less economic sense in the contexts in which migration often tends to develop in the first place. As pointed out by Massey and Parrado (1998), migrants often lack training and entrepreneurial experience, their families are young and have growing consumption needs, and their communities are typically distant from markets and lack basic infrastructure. Finally, to the extent that individuals who pertain to families with migrants have a higher probability of eventually migrating themselves – particularly in LAC, where temporary migration is less frequent than elsewhere in the world – they could have lower incentives to engage in entrepreneurial activities, whose returns may take a long period of time to materialize.

Previous evidence for LAC is limited to Mexico and Nicaragua. In the latter case, Funkhouser (1992) finds that remittances increase self-employment among males but not
females. In the case of Mexico, Massey and Parrado (1998) show that current and recent migration has disruptive effects on entrepreneurship but cumulative remittances exert a positive influence on business formation. This is confirmed by Woodruff and Zenteno (2004), who relate the value of invested capital in small Mexican enterprises with the percentage of migrants and the value of remittances in the state of reference, finding in both cases a positive and significant association. The intended contribution of this section is that of addressing whether the above findings can be generalized to other LAC countries.

As seen in figures 4.12 and 4.13, at least in LAC the incidence of self-employment and business ownership is not overwhelmingly higher among remittances recipients. In three countries – Jamaica, Haiti, and Nicaragua – workers in those labor market categories are less frequently found among recipients. Moreover, in 6 out 11 countries self-employment is more common among non-recipients, and so is business ownership in 5 out of 11 countries.

**Figure 4.12. Self-Employment by Remittance Recipient Status.**

Source: Author's calculations based on household surveys

**Figure 4.13. Business Ownership by Remittance Recipient Status.**

Source: Author's calculations based on household surveys
While the above tabulations are a useful first approximation, as in the case of other types of household and individual behaviors examined in this chapter, this type of analysis is likely to be biased by the fact that recipient and non-recipients are quite different populations. Thus, we proceed to compare the incidence of self-employment and business ownership in a regression framework that controls for the influence of personal and household characteristics on the probability of being engaged in each of those entrepreneurial activities. The estimated model is as follows.

\[ B_i = \alpha + \beta X_i + \gamma H_i + \delta R_i + \varepsilon_i \]  

(7)

where \( B_i \) represents either a dummy variable for being self-employed or an indicator for being a business owner, while \( X_i \) and \( H_i \) are vectors of respectively personal and household characteristics (include income quintiles, and dummies rural areas and male individuals). As before, \( R_i \) is a "dummy" variable for households that receive remittances, and \( \varepsilon_i \) is a random error term. Results are presented in table 4.10.42

Our results indicate that only in 6 out of 11 countries (El Salvador, Guatemala, Honduras, Ecuador, Paraguay and the Dominican Republic) remittances are significantly and positively associated with self-employment. The results are non-significant in three other countries and in the cases of Jamaica and Haiti a negative relationship is suggested by the data. In terms of the absolute magnitudes of the estimated effects, the largest impact of remittances is found for Mexico and Guatemala, where the probability of being in self-employment increases by more than 10 percentage points. As for the effects on business ownership, our estimates suggest positive and significant effects in only four cases: Mexico, El Salvador, Honduras and Peru.

In order to investigate the economic activities in which recipients are more likely to be engaged, we also estimate the impact of remittances on the probability of being a self-employed in the agricultural, manufacturing and commerce sectors – the estimated equation is similar to (6) changing only the dependent variable.43 The results, reported in table 4.11, suggest that remittances are most likely to increase the likelihood of an individual being engaged in agricultural self-employment, with positive and significant effects in five countries, compared to three cases of positive effects for manufacturing, and two cases of positive links for the commerce sector (Guatemala and Haiti). Negative links between remittances and self-employment are found only for the agricultural sector, in the cases of Haiti, Jamaica and the Dominican Republic.

---

42 The complete set of control variables in vectors \( X_i \) and \( H_i \) includes dummies for income quintiles, rural areas, male individuals, a quartic in age, indicators for educational attainment and marital status, measures of household size and composition, an indicator for home ownership, and state/province dummy variables. The sample is restricted to individuals aged 20 to 59. As in the analysis of household expenditures, we have also estimated models in which remittances are instrumented using a proxy for the presence of migrant networks interacted with household characteristics that affect the decision to migrate. The results are qualitatively similar so we concentrate on the above described "probit" model.

43 Because the fraction of individuals who report business ownership is relatively small in all countries, we do not further disaggregate it by economic sector.
Table 4.10. Remittances and Entrepreneurship

<table>
<thead>
<tr>
<th>Sample Dependent Variable</th>
<th>20-59 Years Old</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-Employment</td>
<td>Own Business</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.108***</td>
<td>0.013**</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>0.012</td>
<td>0.036***</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.101***</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Honduras</td>
<td>0.031***</td>
<td>0.031***</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0.032**</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Haiti</td>
<td>-0.029***</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Peru</td>
<td>0.001</td>
<td>0.022*</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Paraguay</td>
<td>0.068**</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>0.018</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Jamaica</td>
<td>-0.038**</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>0.035***</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>0.013</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. *
Significant at 10% level.
Source: Author's calculations based on household surveys

Several of the factors that were mentioned at the beginning of this section as potentially related to the probability that remittance recipient households engage in entrepreneurial activities are likely to vary with income. For instance, if remittances relax credit constraints that limit the opening of new businesses this is likely to happen to a greater extent among poorer households. However, complementary assets and skills which may be needed to leverage remittances income are likely to be less abundant among poorer households. Finally, assuming that risk aversion is decreasing in wealth, poorer households may also be more reluctant to engage in other risky activities besides migration. To uncover which factor prevails in practice, we re-estimate equation (6) adding interactives between remittances and income quintile “dummy” variables. The results, reported in table 4.12, suggest different patterns for self-employment and business ownership. Thus, in the case of the latter, remittances tend to have a positive effect on the probability of individuals from poor households – located in the first income quintile – being business owners. However, this effect becomes increasingly smaller as one moves up in the income distribution, a pattern that is most clear in the cases of Mexico, El Salvador, Honduras, and Ecuador. In contrast, for the case of self-employment, the probability that a household from
the first quintile engages in that activity is actually smaller in 6 out of 11 countries—significantly so in 3. However, in most cases the net effect of remittances eventually becomes positive for upper income quintiles. Overall, our results tend to confirm that access to remittances may positively affect the incentives for entrepreneurship in most income quintiles, with a larger effect on business ownership among poorer households, and a larger effect on self-employment for middle to upper class ones.

An interesting and once again sui generis pattern is found for Mexico, where the likelihood of self-employment increases even for the poorest households but increases even more for those in the top income quintile.

<table>
<thead>
<tr>
<th>Sample</th>
<th>20-59 Years Old in Self-Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agriculture</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.017***</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>0.005***</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.047***</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
</tr>
<tr>
<td>Honduras</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0.012*</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
</tr>
<tr>
<td>Haiti</td>
<td>-0.133***</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
</tr>
<tr>
<td>Peru</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
</tr>
<tr>
<td>Paraguay</td>
<td>0.028*</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
</tr>
<tr>
<td>Jamaica</td>
<td>-0.028***</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>-0.007**</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Signif. at 5% level. * Signif. at 10% level.
Source: Author’s calculations based on household surveys
Table 4.12. Remittances and Entrepreneurship, by Income Quintile

<table>
<thead>
<tr>
<th>Sample</th>
<th>Dependent Variable</th>
<th>20-59 Years Old</th>
<th></th>
<th>Sample</th>
<th>Dependent Variable</th>
<th>20-59 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Self-Employment</td>
<td>Own Business</td>
<td></td>
<td></td>
<td>Self-Employment</td>
</tr>
<tr>
<td>Mexico</td>
<td>Remittances</td>
<td>0.088***</td>
<td>0.048**</td>
<td>Peru</td>
<td>Remittances</td>
<td>0.268</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q2</td>
<td>0.089**</td>
<td>-0.011</td>
<td>Remittances*Q2</td>
<td>0.291</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q3</td>
<td>-0.038</td>
<td>-0.010</td>
<td>Remittances*Q3</td>
<td>0.274</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q4</td>
<td>-0.026</td>
<td>-0.019**</td>
<td>Remittances*Q4</td>
<td>0.306</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q5</td>
<td>0.148**</td>
<td>-0.020*</td>
<td>Remittances*Q5</td>
<td>0.368</td>
<td></td>
</tr>
<tr>
<td>El Salvador</td>
<td>Remittances</td>
<td>-0.056***</td>
<td>0.092***</td>
<td>Paraguay</td>
<td>Remittances</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q2</td>
<td>0.095***</td>
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<td>Remittances*Q2</td>
<td>-0.012</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q3</td>
<td>0.071***</td>
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<td>Remittances*Q3</td>
<td>0.063</td>
<td>-0.029**</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q4</td>
<td>0.081***</td>
<td>-0.041***</td>
<td>Remittances*Q4</td>
<td>0.121</td>
<td>-0.030**</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q5</td>
<td>0.115***</td>
<td>-0.050***</td>
<td>Remittances*Q5</td>
<td>0.163</td>
<td>-0.020</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Remittances</td>
<td>0.091</td>
<td>0.034</td>
<td>Nicaragua</td>
<td>Remittances</td>
<td>0.121</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q2</td>
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<td>-0.011</td>
<td>Remittances*Q2</td>
<td>-0.092</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q3</td>
<td>0.007</td>
<td>-0.013</td>
<td>Remittances*Q3</td>
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<td>-0.017</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q4</td>
<td>-0.026</td>
<td>-0.028</td>
<td>Remittances*Q4</td>
<td>-0.102</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q5</td>
<td>0.012</td>
<td>-0.039</td>
<td>Remittances*Q5</td>
<td>-0.095</td>
<td>-0.066</td>
</tr>
<tr>
<td>Honduras</td>
<td>Remittances</td>
<td>-0.033</td>
<td>0.119***</td>
<td>Jamaica</td>
<td>Remittances</td>
<td>-0.081**</td>
</tr>
<tr>
<td></td>
<td>Remittances*Q2</td>
<td>0.077</td>
<td>-0.020</td>
<td>Remittances*Q2</td>
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<tr>
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<td>Remittances*Q3</td>
<td>0.058</td>
<td>-0.037**</td>
<td>Remittances*Q3</td>
<td>0.028</td>
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</tr>
<tr>
<td></td>
<td>Remittances*Q4</td>
<td>0.090***</td>
<td>-0.051***</td>
<td>Remittances*Q4</td>
<td>0.057</td>
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<tr>
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<td>Remittances*Q5</td>
<td>0.054</td>
<td>-0.062***</td>
<td>Remittances*Q5</td>
<td>0.113</td>
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</tr>
<tr>
<td>Ecuador</td>
<td>Remittances</td>
<td>-0.064</td>
<td>0.113***</td>
<td>Dominican Rep</td>
<td>Remittances</td>
<td>0.082</td>
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<tr>
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<td>Remittances*Q2</td>
<td>0.142**</td>
<td>-0.046***</td>
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<td>-0.018</td>
<td>-0.013</td>
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<td></td>
<td>Remittances*Q3</td>
<td>0.139**</td>
<td>-0.042***</td>
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<td>0.009</td>
<td>0.007</td>
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<td></td>
<td>Remittances*Q4</td>
<td>0.079</td>
<td>-0.034**</td>
<td>Remittances*Q4</td>
<td>-0.065</td>
<td>-0.001</td>
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<td>0.110**</td>
<td>-0.048***</td>
<td>Remittances*Q5</td>
<td>-0.054</td>
<td>-0.008</td>
</tr>
<tr>
<td>Haiti</td>
<td>Remittances</td>
<td>-0.065*</td>
<td>-0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q2</td>
<td>0.018</td>
<td>0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q3</td>
<td>0.053</td>
<td>-0.007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q4</td>
<td>0.007</td>
<td>-0.006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remittances*Q5</td>
<td>0.047</td>
<td>-0.009</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author's calculations based on household surveys

VII. Conclusions

The econometric results presented in this chapter suggest that the effects of remittances on household behavior vary considerably across countries and between different socio-economic groups. In particular, saving rates tend to increase for poorer recipient households but the opposite effect is obtained for richer ones. The composition of household expenditures, on the other hand, is altered in the direction of increasing human capital investments, but except for Mexico this effect is restricted to households located in the middle to upper segments of the income distribution. Moreover, while there is evidence that for some specific groups - defined by country, gender, and urban status - remittances increase children's educational attainment, the impact is often restricted to children with low levels of parental schooling. In the case of health outcomes the results are restricted to two countries – Nicaragua and Guatemala – but in both cases they suggest that remittances improve children health, particularly among low income households. Similarly, a negative link is found between remittances and labor supply, but the effects are often restricted to individuals with low levels of schooling. Finally, entrepreneurship tends to be stimulated by remittances, but the effects once again vary considerably by income quintile.
Chapter 5

Do remittances affect recipient countries financial development*?

As researchers and policy-makers have come to notice the increasing volume and stable nature of remittances to developing countries, a growing interest has emerged regarding their development impact along various dimensions. Surprisingly, little attention has been given to the question of whether remittances promote financial development in recipient countries. Yet, this issue is important because financial systems perform a number of key economic functions and their development has been shown to foster growth and reduce poverty. Furthermore, this question is relevant since many argue that banking remittance recipients will help multiply the development impact of remittances.

I. Introduction

Whether and how remittances might affect financial development is a priori unclear. The notion that remittances can lead to financial development in developing countries is based on the concept that money transferred through financial institutions paves the way for recipients to demand and gain access to other financial products and services, which they might not have otherwise (Orozco, 2005). At the same time, providing remittance transfer services allows banks to “get to know” and reach out to unbanked recipients or recipients with limited financial intermediation. For example, remittances might have a positive impact on credit market development if, as individuals receive sizeable transfers from abroad that are shown to be stable, banks become more willing to extend credit to remittance recipients. Moreover, even if higher bank lending to remittance recipients does not materialize, overall credit in the economy might increase if banks’ loanable funds surge as a result of deposits linked to remittance flows.

Similarly, because remittances are typically lumpy, recipients might have a need for financial products that allow for the safe storage of these funds. In the case of households that receive their remittances through banks, the potential to learn about and to demand other financial products is even larger. On the other hand, because remittances can also help relax

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* This chapter was co-authored by Maria Soledad Martínez Peria, Yira Mascaro, and Florencia Moizeszowicz, with extensive support from Paola Granata for annex 1 and 2. The chapter is based on research conducted with Asli Demirgüç-Kunt, Chris Woodruff, and Ernesto Lopez Córdova. We are grateful to Ernesto Lopez Córdova, Jose de Luna Martínez, Manuel Orozco, and Anna Paulson for providing us data and information used in this chapter.
individuals’ financing constraints, they might lead to a lower demand for credit and have a dampening effect on credit market development. Also, a rise in remittances might not translate itself into an increase in credit to the private sector if these flows are instead channeled to finance the government. Finally, remittances might not increase bank deposits if they are immediately consumed or if remittance recipients distrust financial institutions and prefer other ways to save these flows.

Recent accounts of financial institutions’ attempts to “bank” remittance recipients – by lowering remittance fees and by offering specially designed products – suggest that financial institutions perceive the likely impact of remittances on financial development to be positive. However, empirical research on the impact of remittances on financial development is largely lacking. One exception is a recently completed study by Aggarwal, Demirgüç-Kunt, and Martínez Pería, (2005). Using balance of payment (BOP) statistics for over 90 countries during the period 1975-2003, the study uncovers a positive relationship between remittances and financial development. However, this study looks at all developing countries combined and does not test whether this relationship holds across regions and, in particular, for Latin America and the Caribbean (LAC).

This chapter investigates the association between remittances and financial development for Latin American countries both at the macro and micro level. At the macro level, using the data and empirical approach pursued by Aggarwal et al. (2005), we compare the impact of remittances on financial development for countries within Latin America and outside of the region. At the micro level, the chapter presents research on the association between remittances and the use of banking services in Latin America. With data from 19 household surveys for 11 Latin American countries, we test whether the proportion of households that use financial services is different between remittance recipients and non-recipients in Latin America. Furthermore, we present results from detailed studies on El Salvador and Mexico, two of the largest remittance recipients in the region. These case studies allow us to investigate the association between remittances and financial development more rigorously, controlling for other household characteristics and addressing concerns about reverse causality. We also complement the more rigorous econometric analysis with findings derived from ad-hoc surveys and follow up interviews of selected banks in Colombia and Guatemala (also among the largest remittance recipients in the region). This is intended to illustrate the increasing interest of banks in the remittances business, reported key contributing or limiting factors for the "bancarization" of remitters and senders, and incipient efforts to develop specialized products for cross-selling of services to remittances recipients.

The findings from this chapter can be summarized as follows. The macro level analysis suggests that remittances have a positive impact on the financial development of developing countries overall, but this effect is smaller for Latin American countries. The micro level analysis reveals that while there is evidence that the likelihood of using deposit accounts is higher among remittance recipients, no such effects are present thus far when it comes to bank credit.

45 See Orozco and Fedewa (2005) for a summary of recent efforts by banks in Latin America to convert remittance recipients into bank clients.
Through more research is required to understand what is driving these results, the chapter endorses a number of measures to enhance the impact of remittances on financial development. First, the chapter highlights the importance of policies that facilitate migrant's access to banking services, such as initiatives that provide illegal migrants valid forms of identification in migrant recipient countries, promote financial literacy, reduce the costs of sending remittances through banks and promote the overall use of formal financial institutions. Second, the chapter supports policies that allow financial institutions from Latin America to market their services directly to their diasporas. Third, the chapter underlines the need for governments in Latin America to promote greater outreach by reducing the regulatory burden of opening branches and by allowing banks to provide services through alternative means of delivery like mobile banking and by entering into partnership with non-financial firms that offer greater geographical coverage (e.g., post offices, retail stores, and cooperatives). Fourth, the chapter advocates policies that stimulate competition in the financial sector as a way to guarantee greater outreach for both remittance senders and recipients, at lower costs. Finally, the chapter argues that in order to foster a link from remittance flows to loan use and credit market development issues such as weak creditor rights, inefficient contract enforcement mechanisms, lack of collateral, and government crowding will have to be considered and tackled by governments as potential areas in need of reform.

The rest of the chapter is organized as follows. Section II explores the macro-level association between remittances and financial development for Latin America. Section III presents results from a micro-level analysis of the relationship between remittances and financial development. Using data from 19 household surveys conducted in 11 countries, Section III.a. presents tests for differences in the percentage of households that use financial services among remittance recipients and non-recipients. Sections III.b and III.c look deeper into whether remittances foster financial development and the use of banking services in Latin America, by focusing on the case of El Salvador and Mexico – two of the region's largest remittance recipients. This is complemented by Annex I, based on ad-hoc surveys and follow up interviews of banks in Colombia and Guatemala (complemented by other descriptive documents), which discusses the increasing interest of banks in the remittances business and reports key contributing or limiting factors for the "bancarization" of remitters and senders. Annex II, also based on findings from these ad-hoc surveys and complementary documents, describes incipient efforts for banks in Latin America to develop specialized products for cross-selling of services to remittances recipients. Finally, Section IV concludes and offers some policy implications.

II. Macro-level analysis of the association between remittances and financial development

II.1 Basic correlations

We begin our analysis of the association between remittances and financial development in Latin America, by plotting country-level data on bank deposits and bank credit to the private
sector,\footnote{Bank deposits include all demand, savings, and time deposits held at deposit money banks as reported in the IMF’s International Financial Statistics. Bank credit refers to claims on the private sector held by deposit money banks. These numbers also come from the IMF’s International Financial Statistics.} along with balance of payment statistics on remittances over the period 1975-2002 (see Figure 5.1). All three series are expressed as a share of GDP.

**Figure 5.1. Remittances and financial development in Latin American countries**

\begin{figure}[ht]
\centering
\includegraphics[width=\textwidth]{figure51.png}
\caption{Remittances and financial development in Latin American countries}
\end{figure}
Figure 5.1: Remittances and financial development in Latin American countries (cont.)
Figure 5.1: Remittances and financial development in Latin American countries (cont.)
Figure 5.1: Remittances and financial development in Latin American countries (cont.)

Panama

% of GDP


Deposits
Private Credit
Remittances (left axis)

Paraguay

% of GDP


Deposits
Private Credit
Remittances (left axis)

Peru

% of GDP


Deposits
Private Credit
Remittances (left axis)

St. Kitts and Nevis

% of GDP


Deposits
Private Credit
Remittances (left axis)

St. Lucia

% of GDP


Deposits
Private Credit
Remittances (left axis)

St. Vincent and the Grenadines

% of GDP


Deposits
Private Credit
Remittances (left axis)

Trinidad and Tobago

% of GDP

For 18 out of 25 countries in the region for which we have data on financial development and remittances, we observe that both remittances and financial development have tended to move together in an increasing fashion.\cite{47} This is particularly the case during the 1990s. On the other hand, in five countries - Belize, Dominica, St. Kitts and Nevis, St. Lucia, St Vincent and the Grenadines, remittances and financial development appear to have moved in opposite directions, with financial development rising over the period and remittances falling consistently throughout the sample.

### Table 5.1. Correlation between Remittances and Indicators of Financial Development

<table>
<thead>
<tr>
<th>Country</th>
<th>Remittances - Bank Deposits</th>
<th>Remittances - Bank Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>0.0861</td>
<td>-0.0278</td>
</tr>
<tr>
<td>Barbados</td>
<td>0.8969***</td>
<td>0.8703***</td>
</tr>
<tr>
<td>Belize</td>
<td>-0.6227***</td>
<td>-0.7265***</td>
</tr>
<tr>
<td>Bolivia</td>
<td>0.6298***</td>
<td>0.7099***</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.8279***</td>
<td>0.7390***</td>
</tr>
<tr>
<td>Colombia</td>
<td>0.8074***</td>
<td>0.6256***</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.3151*</td>
<td>0.4129*</td>
</tr>
<tr>
<td>Dominica</td>
<td>0.2699</td>
<td>-0.4757*</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>0.8415***</td>
<td>0.6779***</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0.8279***</td>
<td>0.9183***</td>
</tr>
<tr>
<td>El Salvador</td>
<td>0.7791***</td>
<td>0.5756***</td>
</tr>
<tr>
<td>Grenada</td>
<td>0.4880*</td>
<td>0.3213</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.3501*</td>
<td>0.278</td>
</tr>
<tr>
<td>Haiti</td>
<td>-0.3518</td>
<td>0.1037</td>
</tr>
<tr>
<td>Honduras</td>
<td>0.9408***</td>
<td>0.8753***</td>
</tr>
<tr>
<td>Jamaica</td>
<td>0.5255***</td>
<td>-0.1291</td>
</tr>
<tr>
<td>Mexico</td>
<td>-0.2216</td>
<td>0.0415</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>0.7547***</td>
<td>-0.0628</td>
</tr>
<tr>
<td>Panama</td>
<td>-0.6131***</td>
<td>-0.2459</td>
</tr>
<tr>
<td>Paraguay</td>
<td>0.9357***</td>
<td>0.8687***</td>
</tr>
<tr>
<td>Peru</td>
<td>0.9334***</td>
<td>0.8939***</td>
</tr>
<tr>
<td>St. Kitts and Nevis</td>
<td>-0.3610</td>
<td>-0.5200**</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>-0.3952</td>
<td>-0.5752**</td>
</tr>
<tr>
<td>St. Vincent and the Grenadines</td>
<td>-0.6263***</td>
<td>-0.8606***</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>0.3808**</td>
<td>0.2113</td>
</tr>
</tbody>
</table>

The table reports pairwise correlation coefficients between remittances (as a share of GDP) and two indicators of financial development, for the period 1975-2003. **,**,**,** denote significance at 10, 5, and 1 percent, respectively. Countries shaded in dark grey are those for which there appears to be no link between remittances and financial development. Countries shaded in light grey are those for which the correlation between remittances and financial development is mostly negative. The countries that are not shaded are those for which the correlation between remittances and financial development is positive.

In the case of Argentina and Mexico, it is hard to discern a clear pattern between financial development and remittances. For these two countries, periods of positive association

\cite{47} This is the case for the following countries: Barbados, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, and Trinidad and Tobago.
between these variables have alternated with periods where remittances increase, as financial development collapses. This last type of episode - when remittances and financial development appear to be negatively correlated - seems to correspond to periods of financial banking crises in these countries. It is foreseeable that during such periods both countries underwent recessions, and remittances increased in response to crises, producing the negative association.

Table 5.1 shows country by country correlations between remittances and each of the measures of financial development. These results largely confirm the patterns highlighted above. For Belize, Dominica, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines we observe a negative correlation between remittances and both measures of financial development. Consistent with what Figure 5.1 shows, no clear macro-level relationship appears to exist between financial development and remittances for Argentina and Mexico. Similar results are found for Haiti and Panama. On the other hand, for the remaining 16 countries, the correlations confirm the positive association between financial development and remittances.

II.2 Empirical estimations

While the graphs and correlations above are helpful in describing the association between remittances and financial development, a more rigorous empirical approach is required to obtain a more definitive answer regarding the link between these variables. In particular, it is important to control for other factors that might affect both remittances and financial development and to correct for biases that might arise as a result of measurement error, reverse causation, and omitted country characteristics.

We empirically examine the relationship between financial development and remittances by estimating equations (1) through (3):

\[
FD_{it} = \beta_1 \text{Rem}_{it} + \beta_2 X_{it} + \alpha_i + u_{it} \quad (1)
\]

\[
FD_{it} = \delta_1 \text{Rem}_{it} + \delta_2 \text{Rem}_{it} \times LAC + \delta_3 X_{it} + \alpha_i + u_{it} \quad (2)
\]

\[
FD_{it} = \eta_1 \text{Rem}_{it} + \eta_2 \text{Rem}_{it} \times LAC16 + \eta_3 \text{Rem}_{it} \times LAC5 + \eta_4 \text{Rem}_{it} \times LAC4 + \eta_5 X_{it} + \alpha_i + u_{it} \quad (3)
\]

where \( i \) refers to the country and \( t \) refers to the time period from 1975 to 2003. The dependent variable, \( FD \), is either the share of bank deposits to GDP or the ratio of bank credit to the private sector to GDP, depending on the regression. These are common indicators of financial development (see King and Levine, 1993). \( \text{Rem} \) refers to the ratio of remittances – as recorded in balance of payment statistics – to GDP. \( X \) is a matrix made up of variables that the literature has found to affect financial development: including country size, the level of economic development (as measured by GDP per capita), the inflation rate, financial liberalization, capital and current account openness.

48 Data on financial development, country size, GDP per capita, and inflation come from the International Financial Statistics (IMF) and the World Development Indicators (World Bank). Information on dual exchange rates systems comes from the Annual Report on Exchange Arrangements and Restrictions (IMF).
Equation (1) models the relationship between remittances and financial development for all developing countries combined, allowing for individual country effects. By including an interaction term between a dummy for Latin American countries and the measures of financial development, equation (2) allows the relationship between remittances and financial development to be different for countries in the region vis-à-vis other developing countries. In particular, LAC is a dummy that equals 1 for the 25 countries in the Latin American region included in our sample. The net impact of remittances on financial development for countries in Latin America is given by the sum of $\delta_1$ and $\delta_2$.

Because the graphs and correlations presented above suggest that there are differences across countries within the region when it comes to the link between remittances and financial development, equation (3) separates Latin American countries into three groups. Specifically, we distinguish between the 16 countries for which we found a positive correlation between remittances and financial development (hence forth referred to as LAC16), the 4 countries (LAC4) for which the correlation between remittances and financial development were insignificant, and the remaining 5 countries (LAC5), which exhibited a negative correlation between remittances and financial development. The impact of remittances on LAC16 countries is given by the sum of $\eta_1$ plus $\eta_2$, which for LAC5 countries can be measured by the sum of $\eta_1$ plus $\eta_3$, while the net impact of remittances on LAC4 countries is given by $\eta_1$ plus $\eta_4$.

An important complication in empirically studying the impact of remittances on financial development is the potential for endogeneity biases as a result of measurement error, reverse causation, and omitted variables. Officially recorded remittances are known to be measured with error. In a recent paper based on a survey of central banks, De Luna Martinez (2005) reports that balance of payment statistics produced by developing countries often neglect remittances received via money transfer operators and almost always exclude those transferred via informal means such as hawala operators, friends, and family members. Furthermore, estimates of the size of informal remittances range from 20 to 200 percent of official balance of payment statistics, suggesting that the scope for measurement error is very large (Freund and Spatafora, 2005).

The possibility that remittances affect financial development, giving rise to estimation biases due to reverse causality is also justified. Better financial development might lead to larger measured remittances either because financial development enables remittance flows or because a larger percentage of remittances are measured when those remittances are channeled through formal financial institutions. In addition, financial development might lower the cost of transmitting remittances, leading to an increase in such flows. Finally, omitted factors can explain both the evolution of remittances and of financial development, also leading to biases in the estimated impact of remittances on financial development. Thus, obtaining valid estimates for equations (1)–(3) requires an estimation technique that can deal with measurement error, omitted variables and reverse causality.

There is anecdotal evidence that official estimates of remittance flows in LAC have increased sharply during the last few years partly due to better reporting. At least for the case of Guatemala, this was reported to be the case due to recently introduced regulatory changes related to reporting agencies. For more details see The World Bank, (forthcoming, 2006).
Following the approach pursued by Aggarwal et al. (2006) we present Instrumental Variables (IV) estimations where we use economic conditions – GDP per capita, real GDP growth, and the unemployment rate - in the top remittance-source countries (i.e., the countries from which migrants send money) as instruments for the remittances flows received by the countries in our sample. Economic conditions in the remittance-source countries are likely to affect the volume of remittance flows that migrants are able to send, but are not expected to affect financial development in the remittance receiving countries in ways other than through its impact on remittances or through the effect on other variables we already control for like exports or capital flows. Because bilateral remittance data are largely unavailable, we identify the top remittance-source countries for each country in our sample, using bilateral migration data from the OECD’s Database on Immigrants and Expatriates. This dataset identifies the top five OECD countries that receive the most migrants from each remittance-recipient country. Here we assume that these OECD countries receive the bulk of the migrants from the countries in our sample and account for the majority of the remittance flows sent to the countries in our sample. We construct three instruments by multiplying, respectively, the GDP per capita, the real GDP growth, and the unemployment rate, in each of the top five remittance-source countries by the share of migration to each of these five OECD countries. To check the validity of our set of instruments, in all estimations, we report the Sargan test of overidentifying restrictions. The joint null hypothesis for this test is that the instruments are uncorrelated with the error term and that excluded instruments are correctly excluded from the estimated equation.

Table 5.2 shows results from the instrumental variables estimations on the impact of remittances on financial development including all developing countries together but allowing for country fixed effects and including time dummies to mitigate concerns about omitted variables. Sargan’s tests of overidentifying restrictions reported at the bottom of the table confirm that the instruments used are valid in that they are uncorrelated with the error term. We present regressions including and excluding a dummy to control for periods of domestic financial liberalization, since this variable is available for a smaller set of countries.

We find that remittances have a positive and significant impact on both bank deposits and bank credit. A 1 percentage point increase in the share of remittances to GDP results in approximately a 5 percentage point rise in bank deposits and credit to GDP. Other variables such as log of GDP, GDP per capita, inflation and financial liberalization are also significant in these estimations and have the expected sign.

In Table 5.3 we report results for equation (2), where we allow for remittances to have a different impact among LAC and non-LAC countries by including an interaction between remittances and a dummy for Latin American countries. We find that remittances continue to have a positive impact on financial development, but this effect is smaller among LAC countries. For this group of countries, a one percentage point rise in remittances leads to at most a 4 percentage point increase in deposits and credit to GDP. However, in LAC, contrary to the case of non-LAC countries, the impact of remittances over credit is somewhat larger than for deposits.

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50 http://www.oecd.org/document/51/0,2340,en_2825_494553_34063091_1_1_1_1,00.html.
51 Note that the bilateral migration data is only available for 2000, so the weights we use are constant. The time variation arises from the series on the GDP per capita, real growth rate, and unemployment rate in remittance-source countries.
Table 5.4 shows results allowing remittances to have a different impact across LAC16, LAC5, and LAC4 countries. For LAC16 and LAC4 countries we find that remittances have a positive impact on credit and deposits. Among LAC16 countries, a 1 percentage point increase in remittances results in approximately a 3 percentage point rise in bank deposits/credit, while for LAC4 countries this effect is closer to 2 percentage points. On the other hand, among LAC5 countries remittances appear to have no statistically significant impact on financial development.

In sum, all the estimations presented so far indicate that remittances have a positive impact on financial development, but the effect is smaller for Latin American countries relative to other developing economies. What explains this finding? This is a hard question to tackle and one for which a definite answer is not possible given the data available. Nevertheless, below we discuss some candidate explanations.

First, the impact of remittances on financial development might be smaller for Latin American countries if remittance recipients in these countries relative to recipients in other countries are less likely to use financial institutions to receive remittances. This could be because of greater distrust of these institutions by recipients in LAC. Though there is no formal way of testing this hypothesis, the fact that crises have been more recurrent and severe in Latin America, as shown in Table 5.5, is consistent with this possibility. 52

52 Another possible reason for mistrust, but which cannot be formally tested either is the public perception of an excessive focus of banks on profits and lack of commitment to support the needs of poorer clients. This is cited in Annex II as reported by banks interviewed in Colombia. However, it is unclear if this is a generalized perception in Colombia, if it is the case in other countries in LAC, or even if both of these are true, if this is different from the case in other regions.

Economic conditions in the remittance-source countries are used as instrument for remittances.

<table>
<thead>
<tr>
<th></th>
<th>Bank Deposits to GDP</th>
<th>Bank Credit to GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances to GDP</td>
<td>5.244</td>
<td>4.165</td>
</tr>
<tr>
<td>Log of GDP</td>
<td>(5.29)**</td>
<td>(5.13)**</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>30.293</td>
<td>30.229</td>
</tr>
<tr>
<td>Inflation</td>
<td>(4.41)**</td>
<td>(4.25)**</td>
</tr>
<tr>
<td>Dual exchange rate</td>
<td>5.457</td>
<td>4.065</td>
</tr>
<tr>
<td>Other flows to GDP</td>
<td>-0.002</td>
<td>-0.002</td>
</tr>
<tr>
<td>Exports to GDP</td>
<td>0.562</td>
<td>0.09</td>
</tr>
<tr>
<td>Financial liberalization</td>
<td>3.606</td>
<td>4.078</td>
</tr>
<tr>
<td>Observations</td>
<td>1150</td>
<td>910</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.63</td>
<td>0.68</td>
</tr>
<tr>
<td>Country dummies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time dummies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Sargan test of overidentifying restrictions</td>
<td>0.18</td>
<td>0.3</td>
</tr>
<tr>
<td>P-value for Sargan test</td>
<td>0.91</td>
<td>0.86</td>
</tr>
</tbody>
</table>

The regression equation estimated is of the form $FD_{it} = \beta_0 Rem_{it} + \beta_1 X_{it} + \alpha_i + \epsilon_{it}$, where $FD$ refers to financial development measured as the ratio of bank deposits and, separately, bank credit to GDP. Remittances to GDP is the share of remittances to GDP. $X$ is a matrix of controls including: GDP per capita, measured in constant dollars; Log of GDP, stated in constant dollars; Inflation, defined as the percentage change in the GDP deflator; Dual exchange rates, which is a dummy capturing periods when multiple exchange rates were in effect; Financial liberalization, which is a dummy identifying periods of liberalization in domestic interest rates; Other flows to GDP, defined as foreign direct investment + Non-FDI private inflows + aid to GDP and Exports to GDP is the ratio of total exports to GDP. GDP per capita, real GDP growth, and unemployment rates in remittance-source countries weighted by migration are used as instruments. Time dummies are included but not shown. Absolute value of t statistics in brackets, *, **, and *** denote significance at 10, 5, and 1 percent.
<table>
<thead>
<tr>
<th></th>
<th>Bank Deposits to GDP</th>
<th>Bank Credit to GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances to GDP</td>
<td>16.703</td>
<td>16.185</td>
</tr>
<tr>
<td></td>
<td>[2.31]**</td>
<td>[1.74]*</td>
</tr>
<tr>
<td>LAC × Remittances to GDP</td>
<td>-12.809</td>
<td>-14.1</td>
</tr>
<tr>
<td></td>
<td>[-2.34]**</td>
<td>[-1.73]*</td>
</tr>
<tr>
<td>Log of GDP</td>
<td>49.86</td>
<td>50.711</td>
</tr>
<tr>
<td></td>
<td>[1.98]**</td>
<td>[1.61]*</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>6.507</td>
<td>3.962</td>
</tr>
<tr>
<td></td>
<td>[1.55]</td>
<td>[0.77]</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.002</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>[-0.002]</td>
<td>[-0.002]</td>
</tr>
<tr>
<td>Dual exchange rate</td>
<td>-0.091</td>
<td>-0.982</td>
</tr>
<tr>
<td></td>
<td>[0.03]</td>
<td>[0.34]</td>
</tr>
<tr>
<td>Other flows to GDP</td>
<td>-0.087</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>[1.02]</td>
<td>[0.29]</td>
</tr>
<tr>
<td>Exports to GDP</td>
<td>-0.135</td>
<td>-0.137</td>
</tr>
<tr>
<td></td>
<td>[0.78]</td>
<td>[0.67]</td>
</tr>
<tr>
<td>Financial liberalization</td>
<td>6.423</td>
<td>7.848</td>
</tr>
<tr>
<td></td>
<td>[1.66]**</td>
<td>[1.58]</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Remittances in LAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0: Remittances for LAC=0</td>
<td>3.894</td>
</tr>
<tr>
<td></td>
<td>2.085</td>
</tr>
<tr>
<td></td>
<td>[2.217]</td>
</tr>
<tr>
<td></td>
<td>[3.227]</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>0.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>950</td>
</tr>
<tr>
<td>Country dummies</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Time dummies</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Sargan test of overidentifying restrictions</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>0.32</td>
</tr>
<tr>
<td>P-value for Sargan test</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>0.64</td>
</tr>
</tbody>
</table>

The regression equation estimated is of the form $FD_{it} = \delta_0 Rem_{it} + \delta_1 Rem_{it} \times LAC + \delta_2 X_{it} + \alpha_i + \nu_{it}$, where $FD$ refers to financial development measured as the ratio of bank deposits and, separately, bank credit to GDP. Remittances to GDP is the share of remittances to GDP. LAC is a dummy equal to 1 for all 25 Latin American countries in our sample. $X$ is a matrix of controls including: GDP per capita, measured in constant dollars; Log of GDP, stated in constant dollars; Inflation, defined as the percentage change in the GDP deflator; Dual exchange rates, which is a dummy capturing periods when multiple exchange rates were in effect; Financial liberalization, which is a dummy identifying periods of liberalization in domestic interest rates; Other flows to GDP, defined as foreign direct investment + Non-FDI private inflows + aid to GDP and Exports to GDP is the ratio of total exports to GDP. GDP per capita, real GDP growth, and unemployment rates in remittance-source countries weighted by migration are used as instruments. Time dummies are included but not shown. Absolute value of t statistics in brackets, *, **, and *** denote significance at 10, 5, and 1 percent.
Instrumental Variables Fixed Effects Estimates.
Economic conditions in the remittance-source countries are used as instrument for remittances.

<table>
<thead>
<tr>
<th></th>
<th>Bank Deposits to GDP</th>
<th>Bank Credit to GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances to GDP</td>
<td>15.367</td>
<td>18.153</td>
</tr>
<tr>
<td></td>
<td>(2.39)**</td>
<td>(1.85)*</td>
</tr>
<tr>
<td>LAC16 × Remittances to GDP</td>
<td>-12.233</td>
<td>-15.428</td>
</tr>
<tr>
<td></td>
<td>(2.08)**</td>
<td>(1.63)</td>
</tr>
<tr>
<td>LAC5 × Remittances to GDP</td>
<td>-28.898</td>
<td>-12.576</td>
</tr>
<tr>
<td></td>
<td>(1.97)**</td>
<td>(0.73)</td>
</tr>
<tr>
<td>LAC4 × Remittances to GDP</td>
<td>-13.251</td>
<td>-15.582</td>
</tr>
<tr>
<td></td>
<td>(2.27)**</td>
<td>(1.73)*</td>
</tr>
<tr>
<td>Log of GDP</td>
<td>42.388</td>
<td>64.841</td>
</tr>
<tr>
<td></td>
<td>(2.33)**</td>
<td>(2.15)**</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>6.038</td>
<td>4.615</td>
</tr>
<tr>
<td></td>
<td>(1.54)</td>
<td>(0.80)</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.002</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(1.27)</td>
<td>(0.77)</td>
</tr>
<tr>
<td>Dual exchange rate</td>
<td>-0.484</td>
<td>-3.5</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.74)</td>
</tr>
<tr>
<td>Other flows to GDP</td>
<td>-0.076</td>
<td>-0.042</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td>(0.50)</td>
</tr>
<tr>
<td>Exports to GDP</td>
<td>-0.104</td>
<td>-0.312</td>
</tr>
<tr>
<td></td>
<td>(0.67)</td>
<td>(0.39)</td>
</tr>
<tr>
<td>Financial liberalization</td>
<td>6.05</td>
<td>6.927</td>
</tr>
<tr>
<td></td>
<td>(1.70)*</td>
<td>(1.64)</td>
</tr>
</tbody>
</table>

Remittances LAC16
H0: Remittances for LAC16=0
P-Value 0.07 0.22 0.02 0.11

Remittances LAC5
H0: Remittances for LAC5=0
P-Value 0.27 0.58 0.16 0.74

Remittances LAC4
H0: Remittances for LAC4=0
P-Value 0.1 0.21 0.03 0.07

Observations 1150 910 1143 910
Country dummies Yes Yes Yes Yes
Time dummies Yes Yes Yes Yes
Sargan test of overidentifying re
P-value for Sargan test 0.93 0.78 0.9 0.81

The regression equation estimated is of the form \( FD_t = \eta_0 Rem_{it} + \eta_1 Rem_{it} \times LAC16 + \eta_2 Rem_{it} \times LAC5 + \eta_3 Rem_{it} \times LAC4 + \eta_4 X_{it} + \alpha + u_{it} \), where FD refers to financial development measured as the ratio of bank deposits and, separately, bank credit to GDP. Remittances to GDP is the share of remittances to GDP. LAC16 is a dummy equal to 1 for LAC16 Barbados, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Honduras, Jamaica, Nicaragua, Paraguay, Peru, and Trinidad and Tobago. LAC5 is a dummy equal to 1 for Belize, Dominica, St Kitts, St Lucia, and St Vincent. LAC4 is a dummy equal to 1 for Argentina, Haiti, Mexico, and Panama. X is matrix of controls including: GDP per capita, measured in constant dollars; Log of GDP, stated in constant dollars; Inflation, defined as the percentage change in the GDP deflator; Dual exchange rates, which is a dummy capturing periods when multiple exchange rates were in effect; Financial liberalization, which is a dummy identifying periods of liberalization in domestic interest rates; Other flows to GDP, defined as foreign direct investment + Non-FDI private inflows + aid to GDP and Exports to GDP is the ratio of total exports to GDP. GDP per capita, real GDP growth, and unemployment rates in remittance-source countries weighted by migration are used as instruments. Time dummies are included but not shown. Absolute value of t statistics in brackets, *, **, and *** denote significance at 10, 5, and 1 percent.
Table 5.5. Factors that Might Affect the Impact of Remittances on Financial Development

<table>
<thead>
<tr>
<th>Use of banking services by migrants in the US</th>
<th>Latin America</th>
<th>Eastern Europe and Central Asia</th>
<th>East Asia and the Pacific</th>
<th>South East Asia</th>
<th>Middle East and North Africa</th>
<th>Sub-Saharan Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>% migrants with a savings account in the U.S.</td>
<td>30.00</td>
<td>38.00</td>
<td>47.90</td>
<td>48.40</td>
<td>33.10</td>
<td>62.60</td>
</tr>
<tr>
<td><strong>Crises frequency and severity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Episodes per number of countries</td>
<td>0.8</td>
<td>0.9</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Average fiscal costs of crises (% of GDP)</td>
<td>20.1</td>
<td>8.1</td>
<td>16.7</td>
<td>n.a.</td>
<td>n.a.</td>
<td>12.5</td>
</tr>
<tr>
<td>Average duration of crises episodes (years)</td>
<td>3.5</td>
<td>1.9</td>
<td>4.2</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1.5</td>
</tr>
<tr>
<td>Average output loss (% of GDP)</td>
<td>20.7</td>
<td>6.5</td>
<td>22.4</td>
<td>n.a.</td>
<td>n.a.</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Physical bank presence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branches per 1,000 square km</td>
<td>4.78</td>
<td>7.46</td>
<td>15.51</td>
<td>19.98</td>
<td>33.78</td>
<td>6.28</td>
</tr>
<tr>
<td>Number of branches per 100,000 people</td>
<td>9.31</td>
<td>8.57</td>
<td>6.82</td>
<td>4.45</td>
<td>9.46</td>
<td>2.89</td>
</tr>
<tr>
<td>ATMs per 1,000 square km</td>
<td>10.29</td>
<td>16.08</td>
<td>71.59</td>
<td>3.17</td>
<td>50.81</td>
<td>14.28</td>
</tr>
<tr>
<td>Number of ATMs per 100,000 people</td>
<td>18.96</td>
<td>19.89</td>
<td>21.42</td>
<td>1.08</td>
<td>12.49</td>
<td>6.68</td>
</tr>
<tr>
<td><strong>Cost of using banking services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fees associated with checking accounts (as a percentage of GDP per capita)</td>
<td>0.90</td>
<td>0.20</td>
<td>0.00</td>
<td>5.5</td>
<td>0.46</td>
<td>10.40</td>
</tr>
<tr>
<td>Fees associated with savings accounts (as a percentage of GDP per capita)</td>
<td>0.57</td>
<td>0.05</td>
<td>0.05</td>
<td>3.04</td>
<td>0</td>
<td>1.77</td>
</tr>
<tr>
<td>Average fees on loans (as a percentage of GDP per capita)</td>
<td>1.62</td>
<td>1.23</td>
<td>1.30</td>
<td>4.54</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td><strong>Legal rights and contract enforcement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Rights Index</td>
<td>3.8</td>
<td>5.6</td>
<td>5.3</td>
<td>3.8</td>
<td>4.1</td>
<td>4.4</td>
</tr>
<tr>
<td>Time to enforce contracts (days)</td>
<td>461.3</td>
<td>393</td>
<td>406.8</td>
<td>385.5</td>
<td>432.1</td>
<td>438.5</td>
</tr>
</tbody>
</table>

Data sources: Osili, U.O. and A. Paulson, (2005); Caprio, G. and D. Klingebiel, (2003); Honohan, P. and D. Klingebiel (2003); Beck, T., Demircu-Kunt, A., Martinez Peria, M.S., (2005); Doing Business: Legal Rights Index reflects the legal rights of borrowers and lenders and measures the degree to which collateral and bankruptcy laws facilitate lending. The index ranges from 0 to 10, with higher scores indicating that collateral and bankruptcy laws are better designed to expand access to credit. Time to enforce contracts measures the efficiency of the judicial (or administrative) system in the collection of overdue debt. The time required for dispute resolution is recorded in calendar days, counted from the moment the plaintiff files the lawsuit in court until settlement or payment.

Second, the impact of remittances on financial development in Latin America might be smaller if remittance recipients in these countries are less likely to receive remittances via banks, either because Latin American migrants do not use banks as much to send the remittances or because the beneficiaries do not use banks as much at the receiver end. Presumably, in countries where remittances are more frequently received via banks, recipients are more likely to open bank accounts and use other financial services. Also, in recipient countries where banks play a large role in the remittances business, banks are in a better position to learn about remittance recipients and are more likely to seek them out as clients for other products. As suggested by surveys of remittances senders performed by the IDB, Banks respond for only 7 percent of all remittances sent to Latin America, compared to 78 percent for money transfer operators and 11 percent of transfers made through people traveling to home countries (see chapter 9). Furthermore, this hypothesis is also supported by statistics on the percentage of migrants in the U.S. that have bank accounts obtained from Osili and Paulson (2004). Their numbers, shown on Table 5.5, indicate that Latin American migrants residing in the U.S. are less likely to have bank accounts when compared to migrants from other regions. One possible explanation for this result...
might be related to the fact that migrants from Latin America tend to be less educated, as shown in Chapter 2. Overall, the lower usage of bank accounts by migrants in the U.S. is noteworthy because it might suggest that Latin American migrants are less likely to send money back home through direct deposits in banks. Regarding the receiver end of the transaction, IDB 2006 estimates percentages of the distribution market for 13 countries in Latin America and calculates a regional average based on these data, adjusted by the volume of remittances in each country. The findings suggest that banks are an important means of remittance payment in home countries (about 49 percent), only slightly smaller than all other alternatives combined. However, this report also indicates that a very small percentage of the remittances paid by banks actually enter the financial system through existing or new accounts, acting these banks more as payment agents much like retail payers in small businesses.53

Third, remittances might not spur as much deposits or credit growth in Latin America if access to physical banking outlets is more limited in this region than in other countries. Table 5.5 shows data reported in Beck, Demirguc-Kunt, and Martinez Peria (2005) on the average number of branches and ATMs per square kilometer and per 100,000 inhabitants across regions. While the presence of physical banking outlets per capita is not consistently lower for Latin American countries relative to other regions, there is some evidence that geographic penetration is low in Latin America. In particular, the number of branches per area is the lowest among all regions, suggesting that perhaps distance to the nearest branch is an obstacle for remittance recipients to demand and use financial services in Latin America.

Fourth, the impact of remittances on financial development in Latin America might be smaller than that observed for other countries if the costs of banking are larger in the region. Recently, collected data from Beck, Demirguc-Kunt, and Martinez Peria (2006) suggest that the costs of maintaining a bank account and the fees associated with loans are higher in Latin America than in most countries with the exception of some in South East Asia and in Africa.

Finally, even if the supply of loanable funds increases with remittances, credit might not rise in Latin America due to weaker creditor protection and poorer contract enforcement. Legal rights rankings and statistics on the number of days to enforce a contract from the World Bank’s Doing Business (2005) dataset shown on Table 5.5 reveal that Latin America ranks below all other regions along these dimensions. The data presented in Table 5.5 offer some support for the validity of the factors discussed above in explaining why remittances might have a smaller impact on financial development in Latin America vis-à-vis other regions. However, further research is required to validate this tentative evidence and to establish the degree to which each of these factors is important.

III. Micro-level analysis of the association between remittances and financial development

While it is useful to investigate the relation between remittances and financial development using macro-level data, as discussed in chapter 3 cross country analysis have

53 At least for the cases analyzed through ad-hoc surveys and field interviews, exclusivity agreements of banks with money transfer operators have hindered the banks' capacity to convert these recipients into clients (see Annex I).
important limitations. In what follows we use household-level survey data to investigate the association between remittances and financial development. Here we equate financial development with greater use of financial services. First, we compare some simple statistics on the proportion of households with deposit accounts and loans among remittance recipients and non-recipients in Latin America. Second, we look deeper into the link between remittances and the use of financial services in the region by conducting case studies on El Salvador and Mexico. Both countries are among the largest recipients of remittances in Latin America and the data available in both cases is detailed enough to allow us to correct for biases resulting from omitted variables and endogeneity.

III.1. Evidence from household-level tests

Using household surveys for 11 Latin American countries – Bolivia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Peru, and Suriname – we now investigate whether the use of financial services differs between households that receive remittances and those that do not. In particular, we examine the proportion of households that have a deposit account and the share of those that have outstanding bank credit. For comparison, we also report on the share of households with non-bank credit among remittance recipients and non-recipients.

Table 5.6 shows summary statistics for a total of 19 surveys conducted in the 11 countries mentioned above. Data on bank accounts is available in 13 of the 19 surveys, information on bank credit outstanding is contained in 16 of the surveys, and there are 12 surveys that include data on non-bank credit. The proportion of households with bank accounts for remittance recipients exceeds that for non-recipients in 11 out the 13 surveys for which deposit information is available. However, these differences are statistically significant in only 5 surveys and 4 countries.\textsuperscript{54} In the case of the proportion of households that receive credit, we find that ratios are higher among remittance recipients in 9 out of 16 surveys. Differences are statistically significant in the right direction in only four cases. Finally, the proportion of remittance recipient households with credit outstanding from non-bank sources exceeds that for non-recipients in 7 out of the 12 surveys. However, these differences are only significant in one case.

All in all, household level data provides some evidence consistent with the hypothesis that the use of financial services is more prevalent among remittance recipient households. This is particularly the case for deposit holdings and less so for credit. However, this evidence needs to be taken with a grain of salt for at least two important reasons. First, the tests conducted do not control for other households characteristics that might account for differences in the use of financial services. Second, these simple statistics suggest a correlation between remittances and the use of financial services, but are in no way proof of causality.

\textsuperscript{54} In the case of Honduras, the ratios come from Orozco (2005) and he does not report a test for differences across recipients and non-recipients.
Table 5.6. Testing for Differences in the Use of Banking Services by Remittance Recipients and Non-Recipients

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Percent of Households with bank deposits</th>
<th>Percent of Households with non banking credit</th>
<th>Percent of Households receiving remittances</th>
<th>Number of Households in survey</th>
<th>Bank Deposits</th>
<th>Bank Credit</th>
<th>Non Banking Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Percent of Recipients</td>
<td>P-value test of differences</td>
<td>Percent of Non - Recipients</td>
<td>P-value test of differences</td>
<td>Percent of Recipients</td>
<td>P-value test of differences</td>
<td>Non - Recipients</td>
</tr>
<tr>
<td>Bolivia</td>
<td>2000</td>
<td>9.92%</td>
<td>5.47%</td>
<td>5.60%</td>
<td>3.38%</td>
<td>4,994</td>
<td>9.91%</td>
<td>13.01%</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>-</td>
<td>2.44%</td>
<td>17.10%</td>
<td>5.43%</td>
<td>5,999</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>-</td>
<td>2.15%</td>
<td>14.90%</td>
<td>3.43%</td>
<td>5,746</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>1996</td>
<td>4.94%</td>
<td>-</td>
<td>19.51%</td>
<td>5,548</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>4.64%</td>
<td>-</td>
<td>13.44%</td>
<td>3,757</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ecuador</td>
<td>2003</td>
<td>12.87%</td>
<td>-</td>
<td>6.42%</td>
<td>18,959</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>5.83%</td>
<td>11.25%</td>
<td>10.43%</td>
<td>15.03%</td>
<td>7,38</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>14.13%</td>
<td>6.58%</td>
<td>26.32%</td>
<td>13.48%</td>
<td>6,23</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>24.57%</td>
<td>3.01%</td>
<td>23.67%</td>
<td>22.83%</td>
<td>697</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>El Salvador</td>
<td>2001</td>
<td>24.64%</td>
<td>2.03%</td>
<td>37.97%</td>
<td>26.74%</td>
<td>690</td>
<td>19.44%</td>
<td>39.13%</td>
</tr>
<tr>
<td>Guatemala</td>
<td>2000</td>
<td>15.43%</td>
<td>2.80%</td>
<td>8.38%</td>
<td>3.41%</td>
<td>7,276</td>
<td>14.89%</td>
<td>30.70%</td>
</tr>
<tr>
<td>Honduras</td>
<td>2003</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,750,303</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,750,303</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Haiti</td>
<td>2001</td>
<td>11.74%</td>
<td>0.05%</td>
<td>9.03%</td>
<td>25.25%</td>
<td>7,147</td>
<td>7.48%</td>
<td>24.60%</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7.48%</td>
<td>24.60%</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1997</td>
<td>67.82%</td>
<td>9.59%</td>
<td>86.45%</td>
<td>30.85%</td>
<td>2,029</td>
<td>65.23%</td>
<td>73.59%</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>2000</td>
<td>1.60%</td>
<td>6.09%</td>
<td>10.49%</td>
<td>41.95%</td>
<td>4,191</td>
<td>1.40%</td>
<td>2.10%</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>2.13%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.21%</td>
<td>1.89%</td>
</tr>
<tr>
<td>Peru</td>
<td>2002</td>
<td>1.68%</td>
<td>-</td>
<td>-</td>
<td>28.41%</td>
<td>18,598</td>
<td>1.69%</td>
<td>1.66%</td>
</tr>
<tr>
<td>Suriname</td>
<td>2001</td>
<td>17.32%</td>
<td>19.95%</td>
<td>6.17%</td>
<td>10.73%</td>
<td>410</td>
<td>16.67%</td>
<td>22.73%</td>
</tr>
</tbody>
</table>

To mitigate at least the first problem, we use household survey data from three countries which have been analyzed elsewhere in the report – Guatemala, Haiti and the Dominican Republic – to estimate simple “probit” models of the probability of having deposit accounts, outstanding bank credit and non-bank credit, controlling for household income and other household characteristics – i.e. age of the household head, educational attainment of adults, household size and composition, urban status of the locality and province “dummy” variables. The estimates for the impact of remittances are shown in table 5.7, which also reports the coefficients of variables representing the 2nd through 5th quintiles of the income distribution – using counterfactual pre-migration incomes estimated in chapter 3. In the three countries the results show that, as expected, the probability of having deposit accounts increases monotonically with income, and so does the likelihood of having outstanding bank credit – except in the case of Guatemala. Moreover, within given income quintiles, households with access to remittances are significantly more likely to report deposit accounts. However, at least in Haiti and the Dominican Republic, recipients are also less likely to have bank and non-bank outstanding credit suggesting a role for remittances to relax financing constraints.

Table 5.7. Remittances and Access to Financial Services in Guatemala, Haiti and the Dominican Republic

<table>
<thead>
<tr>
<th>Country</th>
<th>Guatemala</th>
<th>Dominican Republic</th>
<th>Haiti</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bank Deposits</td>
<td>Bank Credit</td>
<td>Non-Bank Credit</td>
</tr>
<tr>
<td>Remittances</td>
<td>0.114***</td>
<td>-0.011</td>
<td>0.013</td>
</tr>
<tr>
<td>Counterfactual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income Quintiles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>-0.016</td>
<td>-0.022***</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.007)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Q3</td>
<td>0.033*</td>
<td>-0.012</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.008)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>Q4</td>
<td>0.116***</td>
<td>-0.014</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.008)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>Q5</td>
<td>0.239***</td>
<td>0.018*</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.012)</td>
<td>(0.020)</td>
</tr>
</tbody>
</table>

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

The above results are complemented in what follows with a more detailed analysis of the relationship between remittances and the use of financial services for two of the largest remittance recipients in Latin America: El Salvador and Mexico. The datasets we use allow us to control for a variety of factors that might also influence the use of financial services. Finally, the analysis we conduct tackles the concern that remittances might be endogenous by conducting instrumental variables estimations.

III.2 Evidence from two case studies: El Salvador and Mexico

III.2.1 El Salvador

El Salvador is Latin America’s fifth largest recipient of remittances in dollar terms and the third largest as a share of GDP. During the last decade, remittances have averaged almost 1.4

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55 The analysis on El Salvador is based on research by Demirguc-Kunt and Martinez Peria (2006).
billion dollars or 14 percent of GDP. El Salvador is also among the most financially developed countries in the region. In 2003, deposits and private bank credit in this country reached 42 percent and 39 percent of GDP, respectively.

To investigate the relationship between remittances and financial development for El Salvador, we use data from a nationally representative rural panel survey conducted by the Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES), and the Rural Finance Program at the Ohio State University. The panel data set is composed of four biennial observations for 1995, 1997, 1999, and 2001. The surveys include 738 households in 1995, 623 in 1997, 697 in 1999, and 690 in 2001. There are 719 households that were surveyed twice or more times and 451 households that appear in all four surveys.

The surveys identify households that receive remittances and contain information about whether members of the household use banking services. In particular, the surveys ask whether households have a bank account and whether they solicited bank loans and have outstanding bank credit. The surveys also contain information about the remitters. In particular, they identify the length of time that they have been outside of El Salvador. Finally, the survey contains other socio-economic data about the households including information on households’ income, housing, education, and occupation. Table 5.8 provides detailed definitions for the variables used from the FUSADES surveys and reports descriptive statistics.

Our empirical analysis focuses on estimating different variants of equations (3), (4), and (5) below:

\[
Deposit_{it} = \alpha_0 + \alpha_1 \text{Remittances}_{it} + \alpha_2 X_{it} + u_{it} 
\]

\[
Credit \text{ outstanding}_{it} = \beta_0 + \beta_1 \text{Remittances}_{it} + \beta_2 X_{it} + v_{it} 
\]

\[
Credit \text{ application}_{it} = \delta_0 + \delta_1 \text{Remittances}_{it} + \delta_2 X_{it} + w_{it} 
\]

i is the household identifier and t represents the time period.

Deposit is a dummy that equals 1 if the household has a bank deposit account and 0 otherwise. Credit outstanding is a dummy that takes the value 1 if the household has any outstanding loans and 0 otherwise. Credit application refers to a dummy variable that equals one if the household applied for a loan in period t. In all three equations, Remittances is a dummy variable that identifies those households that receive international remittances. X is a matrix of household level controls, including household income, educational level of the head of household, the number of rooms in the house, and a dummy for whether at least one member of the household is employed in agricultural activities. Because all three dependent variables are discrete, equations (3)-(5) are estimated as probit models.

Panel A in Table 5.9 shows probit results for the likelihood that a household has a bank account. We report marginal effects as opposed to coefficients. We include estimations for households that appear at least twice and, separately, four times in the four year database. Our estimations indicate consistently that households that receive remittances have a higher
likelihood (between 0.12 and 0.16 percentage points higher) of owning a deposit account regardless of which household characteristics we control for and independently of whether we focus on households that appear in at least two or in all four of the surveys.

To investigate whether remittance recipients are more likely to use bank credit we distinguish between the likelihood of applying for a loan during the survey period and the probability of having outstanding credit. Panel B presents the results for the likelihood of having outstanding debt. Once again, we report results for households that were surveyed two or more times and for those included in all four surveys. Consistently across all estimations, we find that the likelihood of having outstanding bank debt does not seem to be affected by whether households receive remittances. The dummy for whether the household receives remittances is always insignificant. As shown in the appendix, this is also true if we focus on non-bank credit instead.

Table 5.8. Data Description and Summary Statistics: El Salvador Case Study on the Impact of Remittances on the Use of Financial Services

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Definitions</th>
<th>Source</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Remittances</td>
<td>Dummy equals to 1 indicates that the household receives international remittances</td>
<td>Encuesta a familias salvadoreñas, Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES)</td>
<td>2,715</td>
<td>0.20</td>
<td>0.40</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bank Deposits</td>
<td>Dummy equals to 1 indicates that the household has bank deposits</td>
<td>Idem</td>
<td>2,747</td>
<td>0.17</td>
<td>0.38</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bank Credit</td>
<td>Dummy equals to 1 indicates that the household has outstanding bank credit</td>
<td>Idem</td>
<td>2,748</td>
<td>0.10</td>
<td>0.30</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Application for Bank Credit</td>
<td>Dummy equals to 1 indicates that the household has applied for bank credit</td>
<td>Idem</td>
<td>2,748</td>
<td>0.11</td>
<td>0.32</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Household Income</td>
<td>Total Income for Household (in thousands of colones)</td>
<td>Idem</td>
<td>2,696</td>
<td>14.88</td>
<td>17.44</td>
<td>0</td>
<td>225</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>Dummy equals to 1 indicates that there is at least one member of the household working in agricultural activities</td>
<td>Idem</td>
<td>2,748</td>
<td>0.54</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>Total rooms in household</td>
<td>Idem</td>
<td>2,719</td>
<td>1.74</td>
<td>0.91</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>Educational level of the head of the household</td>
<td>Idem</td>
<td>2,720</td>
<td>2.78</td>
<td>3.13</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

The table describes the variables used in the case study analysis of the link between remittances and the use of financial services in El Salvador. Data comes from a conducted by Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES) in 1995, 1997, 1999, and 2001. Approximately 700 households were included each year. Results of the analysis are show on tables 8 and 9.
Results for the likelihood of applying for a bank loan on the year of the survey (shown on Panel C of Table 5.9) are similar to those discussed above for the probability of having outstanding credit. Once again the dummy for remittance recipients is never significant. That is, independently of whether we look at households that are present two or four years in the sample, and regardless of which type of household characteristics we control for, we find that remittance recipients are as likely to have outstanding debt as those that do not receive remittances.

The estimates reported so far on whether households that receive remittances are more likely to use financial services might be biased if there are omitted relevant household characteristics or if the likelihood that a household receives remittances is endogenous. To address these concerns, Table 5.10 presents estimations including household fixed effects and, separately, instrumenting for remittances. Including household fixed effects should help mitigate the concern that the association between remittances and the use of banking services is driven by omitted household characteristics. However, because for many households there is no variation in their status as remittance recipients or as users of banking services, the number of observations when we include fixed effects is smaller since those households for which there is no change are dropped from the estimations.

Fixed effects estimations yield very similar results to those reported above. We find that remittance recipient households are more likely than non-recipients to have a bank account but are no different when it comes to the likelihood of having outstanding debt or applying for a loan.

The fact the FUSADES surveys contain information about the migrants who sends the remittances allows us to instrument for the likelihood that a household receives remittances. In particular, we speculate that the length of time since the migrants left El Salvador is likely to influence whether households receive remittances, but it is not likely to independently affect the households’ use of banking services. Thus, we use the number of years migrants have resided abroad and the number of years squared (to allow for a non-linear relationship between length of stay overseas and sending remittances) as an instrument for the likelihood that a household receives remittances.56

The instrumental variable estimations confirm the results discussed above. Namely, we find that remittance recipient households are more likely than non-recipients to have a bank account, but the probability that recipient households apply for and have outstanding credit is not different for remittance recipient and non-recipient households.

What role does the way in which remittances are received play in the results reported so far? The surveys for El Salvador contain information as to whether remittances are received via banks, money transfer operators, relatives, etc for two years: 1999, 2001. Table 5.12 shows

56Based on a survey of Latin American migrants in the U.S. conducted in November 2001 by Bendixen and Associates, Orozco (2003) reports that there is a non-linear relationship between remittances sent and the length of stay in the U.S. In the first years of arrival, migrants are less likely to remit partly because of their limited income and because of obligations incurred when arriving in the country. As immigrants settle over time, they send more, in part because they earn more. However, after an extended period of time, remittances decline in part because of greater obligations faced by the migrants in the host country and because ties to the country of origin weaken in some cases.
results for the likelihood of having bank accounts, having outstanding credit, and soliciting loans where we interact the remittance recipient dummy with a dummy indicating whether remittances were received through the banking sector. The results show that the likelihood that remittance recipients have bank accounts is twice as large if remittances are channeled through the banking sector. On the other hand, no such effect is present on the credit side.

Overall, the findings for El Salvador indicate that remittance recipients - especially those that receive funds via banks - are more likely to open bank accounts relative to other individuals. However, when it comes to credit, we do not observe any differences in credit application and usage by remittance recipients and non-recipients. Since in El Salvador the financial system (banks and non-banks) is relatively deeper than in other LAC countries, more research is needed to explore if there are other limitations to ease the typical constraints to broaden access to credit for segments of the population that have limited credit payment history and insufficient collateral, of if these constraints are different for remittance recipients.

III.2.2 Mexico\textsuperscript{57}

Mexico is Latin America’s largest recipient of remittances in dollar terms so the potential for remittances to impact financial development is perhaps largest in this country. Though remittances are 2 percent of GDP, they amount to approximately 10 percent of banking sector deposits and credit. Also, in recent years both Mexican and foreign banks have taken steps to enter the remittance business and to cross-sell products to remittance senders and recipients, a move that if successful should be reflected in greater financial development.\textsuperscript{58}

To analyze the relationship between remittances and financial development for the case of Mexico, we combined information from the 2000 Mexican Census on the share of households across Mexican municipalities that receive remittances with municipal level information from the Comisión Nacional Bancaria y de Valores (CNBV) on the size of the commercial banking sector, and use of their services across municipalities. In particular, we collected information on the number of commercial bank branches, the value and number of commercial bank deposits, and the amount of commercial bank loans outstanding. Finally, to control for other municipal level characteristics that might affect financial development, we also collected information for each municipality on GDP per capita, the average years of schooling among household heads, the percentage of households with access to piped water, the percentage of households with a telephone line, the share households with at least one member employed in agricultural activities, and the percentage of the population within the municipality residing in rural localities (those with less than 2500 people). Table 5.12 provides definitions, data sources, and descriptive statistics for all the variables included in the Mexico case study.

\textsuperscript{57} This section relies heavily on the analysis conducted by Demirguc-Kunt, Lopez Cordova, Martinez Peria, and Woodruff (2006).

\textsuperscript{58} See Hernandez-Coss (2004) and Orozco (2004) for a description of efforts by U.S. banks to penetrate the remittance business to Latin America.
Table 5.9. Are Remittance Recipients More Likely to Use Banking Services? Probit estimations for El Salvador

<table>
<thead>
<tr>
<th></th>
<th>Panel A: Likelihood of having a bank account</th>
<th>Panel B: Likelihood of having outstanding bank debt</th>
<th>Panel C: Likelihood of applying for a bank loan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Including households surveyed two or more times</td>
<td>Including households surveyed four times</td>
<td>Including households surveyed two or more times</td>
</tr>
<tr>
<td></td>
<td>Including households surveyed four times</td>
<td></td>
<td>Including households surveyed four times</td>
</tr>
<tr>
<td>International Remittances Recipient</td>
<td>0.133 0.149 0.133 0.122 0.146 0.147</td>
<td>0.143 0.145 0.141 0.130 0.160 0.142</td>
<td>-0.015 -0.014 -0.015 -0.014 -0.010</td>
</tr>
<tr>
<td></td>
<td>6.60*** 7.11*** 6.60*** 6.09*** 7.16*** 6.91***</td>
<td>5.73*** 5.45*** 5.66*** 5.17*** 6.17*** 4.98***</td>
<td>0.94 0.63 0.90 0.98 0.90 0.98</td>
</tr>
<tr>
<td>Household Income</td>
<td>0.004 0.003 0.004 0.004</td>
<td>0.002</td>
<td>0.001 0.000 0.000 0.000 0.000 0.000</td>
</tr>
<tr>
<td></td>
<td>7.35*** 4.93***</td>
<td>5.60*** 3.80***</td>
<td>2.05** 1.20 0.71 0.90 2.13 0.90</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>-0.002 0.018</td>
<td>0.017 0.027</td>
<td>-0.017 0.018 0.017 0.017 0.017 0.017</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>0.063 0.041 0.061 0.040</td>
<td>0.13</td>
<td>1.006 0.007 0.001 0.001 0.001 0.001</td>
</tr>
<tr>
<td></td>
<td>7.93*** 5.02***</td>
<td>6.15*** 3.79***</td>
<td>1.004 0.007 0.001 0.001 0.001 0.001</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>0.027 0.022 0.030 0.023</td>
<td>1.20</td>
<td>1.004 0.007 0.001 0.001 0.001 0.001</td>
</tr>
<tr>
<td></td>
<td>12.05*** 9.30*** 10.44*** 7.40***</td>
<td>0.71</td>
<td>0.71 1.007 0.007 0.007 0.007 0.007</td>
</tr>
<tr>
<td>Observations</td>
<td>2497 2446 2497 2474 2472 2396</td>
<td>1700 1576 1700 1632 1632 1452</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2497 2499 2476 2474 2398</td>
<td>1700 1576 1700 1632 1632 1452</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2499 2448 2499 2476 2474 2398</td>
<td>1700 1576 1700 1632 1632 1452</td>
<td></td>
</tr>
</tbody>
</table>

The table shows probit results for the likelihood that remittance recipients in El Salvador use banking services. The data is described in Table 5.7. Marginal effects are shown instead of coefficients. *, **, *** denote significance at 10, 5, and 1 percent.
Table 5.10. Are Remittance Recipients More Likely to Use Banking Services? Fixed Effects Probit and Instrumental Variables Probit Estimations for El Salvador

<table>
<thead>
<tr>
<th>Panel A: Likelihood of having a bank account</th>
<th>Fixed effects estimations</th>
<th>Instrumental variables estimations</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Remittances Recipient</td>
<td>Fixed effects estimations</td>
<td>Instrumental variables estimations</td>
</tr>
<tr>
<td>0.285</td>
<td>0.287</td>
<td>0.284</td>
</tr>
<tr>
<td>0.272</td>
<td>0.285</td>
<td>0.274</td>
</tr>
<tr>
<td>0.231</td>
<td>0.243</td>
<td>0.231</td>
</tr>
<tr>
<td>0.217</td>
<td>0.236</td>
<td>0.234</td>
</tr>
<tr>
<td>5.06***</td>
<td>4.99***</td>
<td>5.03***</td>
</tr>
<tr>
<td>4.78***</td>
<td>4.97***</td>
<td>4.62***</td>
</tr>
<tr>
<td>6.14***</td>
<td>6.22***</td>
<td>6.12***</td>
</tr>
<tr>
<td>5.72***</td>
<td>6.29***</td>
<td>5.91***</td>
</tr>
<tr>
<td>Household Income</td>
<td>0.003</td>
<td>0.004</td>
</tr>
<tr>
<td>2.28**</td>
<td>2.25**</td>
<td>7.33***</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>0.052</td>
<td>0.056</td>
</tr>
<tr>
<td>1.28</td>
<td>1.32</td>
<td>0.11</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>0.054</td>
<td>0.042</td>
</tr>
<tr>
<td>2.07**</td>
<td>1.59</td>
<td>0.064</td>
</tr>
<tr>
<td>7.77***</td>
<td>4.87***</td>
<td>0.027</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>0.01</td>
<td>0.009</td>
</tr>
<tr>
<td>0.90</td>
<td>0.74</td>
<td>11.92***</td>
</tr>
<tr>
<td>Observations</td>
<td>905</td>
<td>882</td>
</tr>
<tr>
<td>Panel B: Likelihood of having outstanding bank debt</td>
<td>Fixed effects estimations</td>
<td>Instrumental variables estimations</td>
</tr>
<tr>
<td>International Remittances Recipient</td>
<td>Fixed effects estimations</td>
<td>Instrumental variables estimations</td>
</tr>
<tr>
<td>-0.056</td>
<td>-0.045</td>
<td>-0.058</td>
</tr>
<tr>
<td>0.83</td>
<td>0.65</td>
<td>0.41</td>
</tr>
<tr>
<td>0.69</td>
<td>0.11</td>
<td>0.39</td>
</tr>
<tr>
<td>-0.048</td>
<td>-0.048</td>
<td>-0.008</td>
</tr>
<tr>
<td>Household Income</td>
<td>0.002</td>
<td>0.002</td>
</tr>
<tr>
<td>1.33</td>
<td>1.28</td>
<td>2.19**</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>0.035</td>
<td>0.033</td>
</tr>
<tr>
<td>0.73</td>
<td>0.66</td>
<td>1.08</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>0.016</td>
<td>0.017</td>
</tr>
<tr>
<td>0.48</td>
<td>0.50</td>
<td>2.04**</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>-0.029</td>
<td>-0.03</td>
</tr>
<tr>
<td>1.99**</td>
<td>1.96**</td>
<td>0.012</td>
</tr>
<tr>
<td>Observations</td>
<td>653</td>
<td>640</td>
</tr>
<tr>
<td>Panel C: Likelihood of applying for a bank loan</td>
<td>Fixed effects estimations</td>
<td>Instrumental variables estimations</td>
</tr>
<tr>
<td>International Remittances Recipient</td>
<td>Fixed effects estimations</td>
<td>Instrumental variables estimations</td>
</tr>
<tr>
<td>-0.071</td>
<td>-0.056</td>
<td>-0.073</td>
</tr>
<tr>
<td>1.08</td>
<td>0.84</td>
<td>1.11</td>
</tr>
<tr>
<td>0.80</td>
<td>0.97</td>
<td>0.44</td>
</tr>
<tr>
<td>Household Income</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>1.13</td>
<td>1.07</td>
<td>1.79*</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>0.031</td>
<td>0.035</td>
</tr>
<tr>
<td>0.67</td>
<td>0.74</td>
<td>1.22</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>-0.007</td>
<td>-0.008</td>
</tr>
<tr>
<td>0.21</td>
<td>0.26</td>
<td>1.43</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>-0.011</td>
<td>-0.009</td>
</tr>
<tr>
<td>0.80</td>
<td>0.61</td>
<td>3.31***</td>
</tr>
<tr>
<td>Observations</td>
<td>719</td>
<td>703</td>
</tr>
</tbody>
</table>

The table shows fixed effects probit and instrumental variables probit results for the likelihood that remittance recipients in El Salvador use banking services. The data is described in Table 5.7. Marginal effects are shown instead of coefficients. *, **, *** denote significance at 10, 5, and 1 percent.
Table 5.11. Does the Way in Which Remittances Are Transferred Affect The Use of Banking Services?

Probit estimations for El Salvador

| Panel A: Likelihood of having a bank account when money is sent through banks |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| International Remittances Impact | 0.115          | 0.146          | 0.115          | 0.109          | 0.133          | 0.149          |
|                                 | [3.95]**       | [4.79]**       | [3.93]**       | [3.73]**       | [4.48]**       | [4.86]**       |
| Int Rem × Rem sent through banks | 0.192          | 0.179          | 0.195          | 0.161          | 0.168          | 0.166          |
|                                 | [2.61]**       | [2.22]**       | [2.65]**       | [2.17]**       | [2.19]**       | [1.96]**       |
| Income                          | 0.005          | 0.005          | 0.005          | 0.004          | 0.005          | 0.005          |
|                                 | [7.80]****     | [7.80]****     | [5.17]****     | [5.17]****     | [3.15]****     | [5.22]****     |
| Agricultural Employment         | -0.029         | -0.005         | -0.029         | -0.005         | -0.005         | -0.005         |
|                                 | [1.23]         | [1.20]         | [1.23]         | [1.20]         | [1.20]         | [1.20]         |
| Rooms in Household              | 0.062          | 0.039          | 0.062          | 0.039          | 0.034          | 0.027          |
| Household Schooling             | 0.007          | 0.002          | 0.007          | 0.002          | 0.007          | 0.007          |
|                                 | [0.46]         | [0.46]**       | [0.17]         | [0.17]         | [0.23]         | [0.23]         |
| Observations                    | 1372           | 1335           | 1372           | 1372           | 1359           | 1322           |

| Panel B: Likelihood of having an outstanding bank debt when money is sent through banks |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| International Remittances Impact | -0.013         | -0.005         | -0.013         | -0.014         | -0.012         | -0.007         |
|                                 | [0.73]         | [0.30]         | [0.74]         | [0.77]         | [0.67]         | [0.41]         |
| Int Rem × Rem sent through banks | 0.055          | 0.051          | 0.056          | 0.052          | 0.040          | 0.042          |
|                                 | [1.14]         | [1.02]         | [1.15]         | [1.07]         | [0.86]         | [0.85]         |
| Income                          | 0.001          | 0.001          | 0.001          | 0.001          | 0.001          | 0.001          |
|                                 | [2.75]**       | [2.75]**       | [1.54]         | [1.54]         | [1.54]         | [1.54]         |
| Agricultural Employment         | -0.007         | 0.002          | -0.007         | 0.002          | 0.002          | 0.002          |
|                                 | [0.46]**       | [0.17]**       | [0.46]**       | [0.17]**       | [0.17]**       | [0.17]**       |
| Rooms in Household              | 0.007          | 0.002          | 0.007          | 0.002          | 0.007          | 0.007          |
|                                 | [1.09]         | [0.23]         | [1.09]         | [0.23]         | [1.09]         | [0.23]         |
| Household Schooling             | 0.009          | 0.007          | 0.009          | 0.007          | 0.009          | 0.007          |
|                                 | [4.30]**       | [4.30]**       | [3.52]**       | [3.52]**       | [3.52]**       | [3.52]**       |
| Observations                    | 1373           | 1336           | 1373           | 1373           | 1360           | 1323           |

| Panel C: Likelihood of applying for a bank loan when money is sent through banks |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| International Remittances Impact | -0.018         | -0.011         | -0.018         | -0.019         | -0.017         | -0.013         |
|                                 | [0.98]         | [0.56]         | [0.99]         | [1.02]         | [0.92]         | [0.67]         |
| Int Rem × Rem sent through banks | 0.053          | 0.049          | 0.053          | 0.050          | 0.037          | 0.040          |
|                                 | [1.04]         | [0.94]         | [1.06]         | [0.98]         | [0.76]         | [0.77]         |
| Income                          | 0.001          | 0.001          | 0.001          | 0.001          | 0.001          | 0.001          |
|                                 | [2.65]**       | [2.65]**       | [1.44]         | [1.44]         | [1.44]         | [1.44]         |
| Agricultural Employment         | -0.006         | 0.003          | -0.006         | 0.003          | 0.003          | 0.003          |
|                                 | [0.40]         | [0.21]         | [0.40]         | [0.21]         | [0.21]         | [0.21]         |
| Rooms in Household              | 0.007          | 0.001          | 0.007          | 0.001          | 0.001          | 0.001          |
|                                 | [1.01]         | [0.15]         | [1.01]         | [0.15]         | [1.01]         | [0.15]         |
| Household Schooling             | 0.009          | 0.008          | 0.009          | 0.008          | 0.009          | 0.008          |
| Observations                    | 1373           | 1336           | 1373           | 1373           | 1360           | 1323           |

The table shows probit results for the likelihood that remittance recipients in El Salvador use banking services, allowing for an interaction effect with a dummy for whether remittances are received via banks. The data is described in Table 5.7. Marginal effects are shown instead of coefficients. *, **, *** denote significance at 10, 5, and 1, percent.
We examine the impact of remittances on financial development across Mexican municipalities by estimating equations (6)-(9) below:

\[ \text{DepGDP}_i = \alpha_0 + \alpha_1 \text{Remittances}_i + \alpha_2 X_i + \varepsilon_i \]  

(6)

\[ \#\text{DepPerCapita}_i = \beta_0 + \beta_1 \text{Remittances}_i + \beta_2 X_i + \mu_i \]  

(7)

\[ \text{CreditGDP}_i = \delta_0 + \delta_1 \text{Remittances}_i + \delta_2 X_i + \nu_i \]  

(8)

\[ \text{BranchesPerCapita}_i = \phi_0 + \phi_1 \text{Remittances}_i + \phi_2 X_i + \omega_i \]  

(9)

\( \text{DepGDP} \) refers to the share of the value of commercial bank deposits expressed as a percentage of municipal GDP. \( \#\text{DepPerCapita} \) stands for the number of commercial bank deposit accounts per capita. \( \text{CreditGDP} \) is the share of the value of commercial bank loan outstanding to GDP. Finally, \( \text{BranchesPerCapita} \) is the ratio of the number of commercial bank branches to the population in each municipality.

In all four equations, \( \text{Remittances} \) is the percentage of households in the municipality that receive remittances from abroad and the matrix \( X \) stands for the municipal level controls discussed above, including municipal GDP per capita, the rural/urban nature of the municipality, the level of education, and the degree of access to physical infrastructure (water and telephones).

Table 5.13 presents results for the share of deposits to GDP and the number of deposit accounts per capita. We find that municipalities where a larger percentage of the population receives remittances also tend to have higher ratios of deposit accounts per capita and deposit amounts to GDP. A one standard deviation increase in the share of households that receive remittances leads to, approximately, a 0.14 standard deviation change in ratio of deposits per capita and a 0.2 standard deviation change in the share of deposits to GDP.

Table 5.14 shows the results for the number of branches per capita. Regardless of which municipal level variables we control for, we find that municipalities where a larger share of the population receive remittances tend to have a higher number of branches per capita. A one standard deviation change in the share of households that receive remittances brings about approximately a 0.15 standard deviation change in the ratio of branches per capita. Contrary to the findings on deposits and branches, results on Table 5.15 indicate that there does not appear to be a significant association between remittances and credit to GDP across municipalities. The estimates discussed so far for Mexico would be biased and inconsistent in the event that remittances are endogenous or there are unobserved municipal characteristics. To correct for this possibility, Table 5.16 reports results where we instrument for remittances. In particular, we use two different variables as instruments: namely, (i) short-run deviations in rainfall (measured as rainfall for 1999 minus the average historical rainfall for most of the 20th century relative to the standard deviation of rainfall during the last century) and (ii) the sum of the distance of each municipality to the railroad network in existence during the 1920s plus the distance from that point to the US-Mexico border. The rational for including short-run deviations in rainfall resides on the fact that variations in rainfall can have a negative impact on households' income and
increase the need for remittances. On the other hand, it is less likely that short-run shocks to municipal income will affect financial development directly.

Table 5.12. Data Description and Summary Statistics: Mexico Case Study on the Impact of Remittances on Financial Development

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Definitions</th>
<th>Source</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittance-receiving households</td>
<td>Percent of households receiving remittances</td>
<td>INEGI, XII Censo General de Población y Vivienda 2000, Cuestionario Ampliado</td>
<td>2,427</td>
<td>6.56</td>
<td>7.72</td>
<td>0.00</td>
<td>53.71</td>
</tr>
<tr>
<td>Rural Localities</td>
<td>Percent of individuals residing in localities&lt;2500</td>
<td>Idem</td>
<td>2,427</td>
<td>62.19</td>
<td>35.62</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>Average years of school in the population 15 years and older</td>
<td>Idem</td>
<td>2,427</td>
<td>4.48</td>
<td>1.63</td>
<td>0.00</td>
<td>13.57</td>
</tr>
<tr>
<td>Indigenous Language</td>
<td>Percent of household heads speaking an indigenous language</td>
<td>Idem</td>
<td>2,427</td>
<td>23.99</td>
<td>35.45</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Household with Piped Water</td>
<td>Percent of households with piped water</td>
<td>Idem</td>
<td>2,427</td>
<td>72.92</td>
<td>23.86</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Household with Telephone</td>
<td>Percentage of households with telephone</td>
<td>Idem</td>
<td>2,427</td>
<td>12.17</td>
<td>13.39</td>
<td>0.00</td>
<td>80.31</td>
</tr>
<tr>
<td>Household with Agriculture</td>
<td>Percentage of households with at least one member in agriculture</td>
<td>Idem</td>
<td>2,427</td>
<td>36.91</td>
<td>22.85</td>
<td>0.00</td>
<td>97.38</td>
</tr>
<tr>
<td>Bank Deposits</td>
<td>Deposits to GDP (%)</td>
<td>Comisión Nacional Bancaria y de Valores</td>
<td>2,262</td>
<td>0.07</td>
<td>0.66</td>
<td>0.00</td>
<td>28.88</td>
</tr>
<tr>
<td>Bank Credit</td>
<td>Credits to GDP (%)</td>
<td>Idem</td>
<td>2,383</td>
<td>0.02</td>
<td>0.22</td>
<td>0.00</td>
<td>6.86</td>
</tr>
<tr>
<td>Bank Accounts</td>
<td>Bank Accounts to Population (1,000 inhab.)</td>
<td>Idem</td>
<td>2,415</td>
<td>54.35</td>
<td>174.49</td>
<td>0.00</td>
<td>3,717.58</td>
</tr>
<tr>
<td>Bank Branches</td>
<td>Bank Branches to Population (10,000 inhab.)</td>
<td>Idem</td>
<td>2,254</td>
<td>0.24</td>
<td>0.76</td>
<td>0.00</td>
<td>17.76</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>Municipal income per capita as estimated by CONAPO</td>
<td>CONAPO 2001</td>
<td>2,426</td>
<td>3.43</td>
<td>2.62</td>
<td>0.15</td>
<td>32.88</td>
</tr>
<tr>
<td>Distance to US Border</td>
<td>Distance to US Border or Distance to US Border + Distance to Railroad</td>
<td>Lopez Cordova, Ernesto, (2004)</td>
<td>2,427</td>
<td>884.14</td>
<td>364.23</td>
<td>0.50</td>
<td>2,162.73</td>
</tr>
<tr>
<td>Rainfall standard deviation</td>
<td>Rainfall standard deviation</td>
<td>Idem</td>
<td>2,427</td>
<td>0.02</td>
<td>0.25</td>
<td>(0.83)</td>
<td>0.81</td>
</tr>
</tbody>
</table>

The table describes the data used in the empirical analysis of the impact of remittances on financial development across Mexican municipalities. See tables 11, 12, and 13 for empirical results.
Table 5.13. The Impact of Remittances on Bank Deposits Across Mexican Municipalities. OLS Estimations Clustered by State

<table>
<thead>
<tr>
<th></th>
<th>Deposits to GDP</th>
<th>Number of Accounts Per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Households Receiving Remittances</td>
<td>0.0022 (3.10)**</td>
<td>0.0026 (3.33)**</td>
</tr>
<tr>
<td></td>
<td>0.0027 (3.29)**</td>
<td>0.0021 (2.66)**</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.0056 (3.03)**</td>
<td>11.4587 (7.87)**</td>
</tr>
<tr>
<td></td>
<td>-0.0003 (3.84)**</td>
<td>-0.3013 (3.24)**</td>
</tr>
<tr>
<td>Indigenous Language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households with Telephone</td>
<td>0.0030 (6.63)**</td>
<td></td>
</tr>
<tr>
<td>Household Schooling</td>
<td>0.0141 (5.03)**</td>
<td></td>
</tr>
<tr>
<td>Households with Agriculture Labor</td>
<td>-0.0007 (6.99)**</td>
<td></td>
</tr>
<tr>
<td>Households with Piped Water</td>
<td>0.0001 (1.62)**</td>
<td></td>
</tr>
<tr>
<td>Rural Localities</td>
<td>-0.0009 (4.01)**</td>
<td>-0.01 (5.51)**</td>
</tr>
<tr>
<td></td>
<td>-0.0009 (4.88)**</td>
<td>-0.0011 (5.84)**</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0319 (4.09)**</td>
<td>0.0652 (3.30)**</td>
</tr>
<tr>
<td></td>
<td>0.0210 (8.82)**</td>
<td>0.0111 (5.54)**</td>
</tr>
<tr>
<td>Observations</td>
<td>2239 (4.09)**</td>
<td>2239 (3.30)**</td>
</tr>
<tr>
<td></td>
<td>2239 (1.97)**</td>
<td>2239 (0.48)**</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.03</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>0.19</td>
<td>0.36</td>
</tr>
</tbody>
</table>

OLS estimates of the impact of the percentage of households receiving remittances on bank deposits in Mexico. Robust t-statistics are shown from estimations where standard errors are clustered by Mexican state. * significant at 10%; ** significant at 5%; *** significant at 1 percent.
Table 5.14. The Impact of Remittances on Bank Branches Across Mexican Municipalities. OLS Estimations Clustered by State

<table>
<thead>
<tr>
<th>Branches Per Capita</th>
<th>Households Receiving Remittances</th>
<th>GDP per capita</th>
<th>Indigenous Language</th>
<th>Households with Telephone</th>
<th>Household Schooling</th>
<th>Households with Agriculture Labor</th>
<th>Households with Piped Water</th>
<th>Rural Localities</th>
<th>Constant</th>
<th>Observations</th>
<th>R-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0061</td>
<td>0.0081</td>
<td>-0.0015</td>
<td>0.0167</td>
<td>0.0796</td>
<td>-0.0037</td>
<td>0.0012</td>
<td>-0.003</td>
<td>0.1543</td>
<td>2231</td>
<td>0.01</td>
</tr>
<tr>
<td>Observations</td>
<td>2230</td>
<td>2231</td>
<td>2231</td>
<td>2231</td>
<td>2231</td>
<td>2231</td>
<td>2231</td>
<td>2231</td>
<td>0.1346</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.33</td>
<td>0.25</td>
<td>0.42</td>
<td>0.30</td>
<td>0.27</td>
<td>0.24</td>
<td></td>
<td></td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OLS estimates of the impact of the percentage of households receiving remittances on bank branches in Mexico. Robust t-statistics are shown from estimations where standard errors are clustered by Mexican state. *, **, *** denotes significance at 10, 5, and 1 percent.
Table 5.15. The Impact of Remittances on Bank Credit Across Mexican Municipalities.

<table>
<thead>
<tr>
<th>OLS Estimations Clustered by State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households Receiving Remittances</td>
</tr>
<tr>
<td>GDP Per Capita</td>
</tr>
<tr>
<td>Indigenous Language</td>
</tr>
<tr>
<td>Households with Telephone</td>
</tr>
<tr>
<td>Household Schooling</td>
</tr>
<tr>
<td>Households with Agriculture Labor</td>
</tr>
<tr>
<td>Households with Piped Water</td>
</tr>
<tr>
<td>Rural Localities</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>R-squared</td>
</tr>
</tbody>
</table>

Credit to GDP

<table>
<thead>
<tr>
<th></th>
<th>-0.0001</th>
<th>0.0000</th>
<th>-0.0001</th>
<th>0.0003</th>
<th>0.0000</th>
<th>-0.0001</th>
<th>0.0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25</td>
<td>[0.02]</td>
<td>[1.47]</td>
<td>[3.13]***</td>
<td>[0.37]</td>
<td>[2.23]**</td>
<td>[0.47]</td>
<td></td>
</tr>
<tr>
<td>0.0029</td>
<td>[7.08]***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP Per Capita</td>
<td>-0.0001</td>
<td>[3.12]***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 0.001                  | [8.80]***|
| 0.0051                | [4.41]***|
| -0.0002              | [4.63]***|
| 0.0001               | [4.33]***|
| -0.0002              | [4.68]***|
| 0.0000               | [0.26]  | [3.15]***| [4.58]***| [4.98]***|
| -0.0001              | [2.63]**| [4.68]***|
| 0.0091               | [1.59]  | [5.95]***| [0.41]  | [1.49]  | [6.14]***| [4.94]***|
| 0.0242               | [3.15]***|
| Observations          | 2359    | 2358   | 2359    | 2359   | 2359   | 2359   |
| R-squared             | 0.00    | 0.18   | 0.12    | 0.27    | 0.19    | 0.14    | 0.12    |

OLS estimates of the impact of the percentage of households receiving remittances on bank credit in Mexico. Robust t-statistics are shown from estimations where standard errors are clustered by Mexican state. *, **, *** denotes significance at 10, 5, and 1 percent.
<table>
<thead>
<tr>
<th>Table 5.16. The Impact of Remittances on Bank Deposits, Branches and Credit Across Mexican Municipalities. Instrumental Variables (IV) Estimations Clustered by State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance and rainfall deviation used as IVs (no exclusion on distance)</td>
</tr>
<tr>
<td>Bank Deposits</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Households Receiving Remittances</td>
</tr>
<tr>
<td>GDP Per Capita</td>
</tr>
<tr>
<td>Rural Localities</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>Adj. R-squared</td>
</tr>
<tr>
<td>First Stage F-Statistic</td>
</tr>
<tr>
<td>Test of Overidentifying Restrictions</td>
</tr>
<tr>
<td>P-Value</td>
</tr>
<tr>
<td>P-Value</td>
</tr>
</tbody>
</table>

IV estimates of the impact of the percentage of households receiving remittances on bank development in Mexico. Robust t-statistics are shown from estimations where standard errors are clustered by Mexican state. *, **, *** denotes significance at 10, 5, and 1 percent.
The sum of the distance to the border plus distance to the 1920s railroad is used as an instrument for remittances because previous studies have found that in large part the migration patterns we observe today that give rise to remittance flows are driven by historical migration patterns (see Woodruff and Zenteno, 2001, Hanson and Woodruff, 2003, McKenzie and Rapoport, 2004, and López-Córdova 2004 among others). Historical migration flows in Mexico were heavily affected by municipalities’ proximity to the railroad and to the U.S. border. Thus, we assume that proximity to the railroad and border fostered historical and, hence, current migrations from Mexico and through this effect influence the share of households that receive remittances today. By using distance as an instrument we are implicitly assuming that this variable does not affect financial development other than through its effects on remittances. Since it is possible that the establishment of the railroad and/or proximity to the U.S. may have fostered economic growth in some municipalities, causing them to be more financially developed today, we also present estimations where we eliminate municipalities in close proximity to the railroad or the border – those within 40 or 50 kilometers.

We present instrumental variables (IV) estimations in Table 5.16. In particular, we report results controlling both for GDP per capita and the urban/rural character of the municipality. The first-stage F-statistics for the significance of the instruments in explaining remittances are reported at the bottom of the table along with Hansen’s tests of overidentifying restrictions. Both the high F-statistics and the fact that we cannot reject the null of overidentifying restrictions suggests that our instruments are valid.

The IV results are generally consistent with what we reported above. In particular, we find that the share of households that receives remittances has a positive impact on bank deposits (both in terms of numbers and amounts) and bank branches across municipalities, but in 2 out of 3 specifications does not appear to influence the extent of credit market development – the exception being the specification with all municipalities, for which the quality of the instruments based on distance to the railroad may be more questionable.

IV. Conclusions and policy recommendations

Using both macro and micro data, this chapter investigated the impact of remittances on the development of the banking sector and the use of banking services. At the macro level, the results indicate that remittances have a positive impact on financial development (considering both deposit and credit services) in LAC, but the effect is lower than in other developing regions. At the micro level, we find some evidence consistent with the hypothesis that the use of financial services is more prevalent among remittance recipient households, particularly for deposits. However, the impact for LAC countries at the macro level is larger for credit than for deposits, contrary to the case for non-LAC countries. To the extent that this relatively larger increase in credit as a result of remittances flows has not resulted in broader access to credit for remittance beneficiaries, as summarized below, this impact also has potentially important distributional effects that would be larger for LAC countries.

\[^{59}\text{However, results do not change if we include other municipal level controls instead of these ones.}\]
At the micro level, based on case studies for El Salvador and Mexico for which relevant data were available we found similar results on the deposit side, even when controlling for household characteristics) but not for credit. For the case of El Salvador, overall findings indicate that remittance recipients are more likely to open bank accounts relative to other individuals, specially for households that receive funds via banks (the impact is twice as large if remittances are channeled through the banking sector), but no evidence is found in credit application and usage of credit by remittance recipients and non-recipients. For the case of Mexico, results indicate that municipalities where a larger percentage of the population receives remittances also tend to have higher ratios of deposit accounts per capita and deposit amounts to GDP. Also, regardless of which municipal level variables we control for, we find that Mexican municipalities where a larger share of the population receives remittances tend to have a higher number of branches per capita. Results based on IV estimations to account for the possibility of endogeneity of remittances or unobserved municipal characteristics are generally consistent with these findings. That is, the share of households that receives remittances has a positive impact on bank deposits (both in terms of numbers and amounts) and bank branches across municipalities. On the credit side, in 2 out of 3 specifications the share of households that receives remittances does not appear to influence the extent of credit market development (with the exception having the lowest quality of instruments employed for the estimation). Similarly, the Colombian and Guatemalan descriptive case studies reported in annex 1 based on ad-hoc surveys and follow up interviews of banks show that these banks have been thus far much more effective at selling savings products than credit to remittance recipients.

In terms of income characteristics of households and financial sector development aspects, analysis of household data for three countries (Guatemala, Haiti, and the Dominican Republic), which have been analyzed elsewhere in the report suggests that the probability of having deposit accounts increases monotonically with income (using the counterfactual pre-migration incomes estimated in chapter 3) and so does the likelihood of having outstanding bank credit, except in the case of Guatemala. However, at least in the case of Haiti and the Dominican Republic, recipients are also less likely to have bank and non-bank outstanding credit, suggesting a role for remittances to relax financing constraints.

Though more research is required to better understand what drives the findings of our analysis, the results suggest some tentative conclusions and policy implications. Overall, evidence suggests that remittances have a positive impact on financial development but there still is room for improvement, especially regarding remitters and credit. The descriptive analysis of the Colombian and Guatemalan experiences hint that there is potential growth for banks not only on money transfer services but also on savings and credit as: (i) they have been growing rapidly in the remittance distribution business; (ii) their growth has been supported by the elimination of obstacles and exploitation or development of competitive advantages; (iii) some of the remaining limitations for growth could be solved relatively easily and banks are planning on taking action;

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60 Arguably, given the wide variety of remittances patterns that appear to exist among LAC countries, which led to the classification of countries into two sets based on plotted flows, more specific recommendations may have to vary depending on the set of countries. However, the following focuses on broad recommendations since further research is needed to undertake such endeavor, which requires more data than available for this study (e.g., not enough observations to carry out detailed empirical analysis for each group of countries identified based on plotted flows).
and (iv) a proportion of remitters and beneficiaries that have not been “bancarized” seem to be interested in using banks’ financial services.

Both banks and governments in remittance recipient and sender countries have an important role to play to facilitate the leveraging of remittance flows and increase financial deepening, which affects both the supply and demand of financial services.

First, Banks could step up efforts to “bank” migrants and provide credit by using remittances as collateral. Ongoing efforts to continue to “bank” migrants are important, since they will increase the likelihood that migrants send their remittances through bank accounts. In the last couple of years some Latin American banks have started to look into ways to enter the remittance origination market including placing agencies in migrant recipient countries (see annex 1). In addition, U.S. banks and credit unions have made significant inroads in providing remittances and other services to migrants. For this trend to continue, banks need to continue to facilitate access to their services by lowering their cost and by tailoring their products to meet migrants’ needs. In turn, efforts to bank remitters will facilitate turning beneficiaries into clients.

Second, although banks in LAC have undertaken steps to “bank” remittance recipients, these efforts need to be stepped up. Orozco (2005) documents the strategies currently pursued by nine financial institutions in the region to attract remittance recipients – such as offering special promotions for opening accounts and training on how to use banking services. He finds that these efforts have resulted in one fifth of recipients becoming bank clients. Clearly, more needs to be done. He points out that banks are most successful when they have a strong presence in both remittance sending and recipient communities and when they invest in community outreach and socially oriented product offerings. An important step for banks to increase credit to remittance market participants is to systematically collect and analyze information on remitters and beneficiaries transactions to develop products tailored to their needs. The descriptive case studies presented in Annex 1, and ongoing or planed initiatives to develop specialized products presented in Annex 2 further illustrate the potential limitations, avenues for improving them, and ongoing efforts at tailoring of products.

Third, regarding the facilitation of access to financial services to remitters, it is important for governments in both migrant recipient countries and sending countries to work in partnership to implement programs that foster financial access for migrants. This includes financial literacy efforts supported by governments in remittance recipients countries, for instance through consulates and other offices placed in migrant recipient countries. In this context, the ongoing collaboration between Mexico and the U.S. through the “Matricula Consular”, the Automated Clearing House (ACH) system, and the initiatives of the Institute for Mexicans living Abroad are good examples to pursue.

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61 For example, as reported by Orozco (2004), by 2003 Hispanics represented 20 percent of Bank of America’s new accounts and, as of 2004 Wells Fargo attracted 250,000 new clients since offering Intercuenta Express, an account-to-account service allowing customers at Wells Fargo branches to pay $10 to transfer up to $1,000 directly into their beneficiaries’ BBVA-Bancomer account in Mexico.

62 Suro (2005) finds that the cost and flexibility of banking services are one of the main reasons why Latin American migrants in the U.S. are not using banks.
The issuance of the Mexican government of the Matricula Consular, an alternative form of id for undocumented migrants, which has been endorsed by the U.S. Department of Treasury now allows illegal Mexican migrants in the U.S. to apply for banking services. On the other hand, the ACH, established by the Federal Reserve Bank and the Mexican Central bank, has sought to reduce transactions costs for remittances sent via banks is also another form of fruitful collaboration (although its impact has not been as large as anticipated, partly due to the relevance of exchange rate differentials for intermediaries, which would be kept by the Mexican Central bank for transactions under the ACH (see The World Bank, 2006 forthcoming, and Chapter 9).

Finally, to promote financial literacy, the Mexican Foreign Ministry’s Institute for Mexicans Living Abroad invites banks like Wells Fargo, Bank of America, and Citibank to discuss remittances and other services with home town association leaders in the U.S. In order to foster the use of banking services by migrants, efforts such as those undertaken by Mexico need to continue and be embraced by more countries in the Latin American region.

Efforts that directly link migrants with financial institutions from their home countries might also help increase the impact of remittances on local financial development. In this sense, it is important that governments in recipient countries allow financial institutions to operate abroad and to offer financial services to the migrant communities, since such measures have been shown to increase the amount of remittances flowing into the domestic financial sector in other regions.

Fourth, Governments could also adopt policies that support efforts to convert remittance recipients into bank clients. These could include: (i) minimizing the regulatory costs to banks of opening branches and other outlets to serve these communities; (ii) fostering greater outreach by allowing non-traditional methods of delivering banking services such as mobile banking or correspondent arrangements with post offices, retailers, and cooperatives that are better positioned to serve recipient communities; (iii) promoting competition in the financial sector are expected to lead to greater outreach; and (iv) continue improving the collection and analysis of information on remittance flows and patterns. In particular, efforts to promote competition could include: (a) provision of more accurate information about the size and structure of the market to increase banks’ interest in engaging in a larger role and develop specialized products, as they perceive opportunities for economies of scale that could reduce the cost and increase the benefits of banking beneficiaries; (b) promoting more clarity in the pricing of remittances transfers (more than half of the remitters report they don’t know why their beneficiaries receive less money than they had estimated –see Chapter 9 for more details on the opacity of fee structures), which could increase demand pressures to offer better products and reduce costs; and (c) promoting partnerships between formal financial institutions and other financial intermediaries (e.g., microfinance institutions and NGOs) that may have broader outreach to poorer (but bankable) segments of remittance recipients.

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63 The ACH allows banks to originate credit payment by sending them to the Federal Reserve for processing via the same method used for domestic operations, hence potentially reducing the cost of those transactions.

64 The 2006 Global Economic Prospects on migration and remittance mentions examples for countries such as China, Eritrea, India, Israel, Lebanon, Pakistan, and the Philippines.
Channeling of remittances flows to increase credit in the economy and among remittance recipients is likely to be harder than broadening deposits with those flows. Even diagnosing why this is not happening at the moment is not easy. Limitations presented in Annex 1, as reported by selected banks in Guatemala and Colombia, could be further explored to improve diagnosis and analyze potential to ease these limitations. Notwithstanding the difficulties, the potential for increasing the impact of remittances is perceived to be large, at least based on the market test of increased interest of banks in furthering their role in the market and recent ease of limitations banks identified, as reported in Annex 1; this coupled with the incipient development of specialized products, as reported in Annex 2.

One potential problem can be lack of demand. Remittance recipients may not demand credit because the flows they receive from their relatives overseas relax their credit constraints and substitute for credit (the evidence for Haiti and the Dominican Republic appears to support this hypothesis, at least partly). Also, they might not have viable productive projects to pursue or they may be supported by other third parties. However, the results presented in this chapter for El Salvador do not support the hypothesis that the demand for credit is lower among remittance recipients. Nor does it suggest that remittance recipients are any different when it comes to obtaining credit. Data permitting, future research to assess if existing profitable clients of banks have similar household or income characteristics as remittance beneficiaries that are not client could increase the banks’ interest in broadening access to this group.

Supply side factors including lack of collateral of beneficiaries, and insufficient understanding of credit requirements for beneficiaries by banks might all be factors affecting the leveraging of the impact of remittances on financial development. Also, there may be prudential and regulatory obstacles hindering the use of remittances flows to mitigate the typical constraints to credit for those beneficiaries (or remitters) that have limited credit history and no collateral. To the extent that remittances can increasingly be used to compensate for insufficient credit payment history or even as substitute collateral, as it is increasingly the case of Banco Solidario in Ecuador discussed in Annex 2, the more likely it is that banks will increasingly broaden access to credit to remitters. Furthermore, given some evidence that many beneficiaries may have received credit from the informal sectors, governments and banks could support the collection of information on remittances payments and enhance capacity of credit bureaus to consider such information in assessing credit history and analyze behavior patterns of potential clients. More detailed surveys of remittance recipients should be undertaken to better understand why credit does not seem to be increasing as a result of remittances and provide more specific policy recommendations.

Finally, institutional and macroeconomic factors might also help explain why credit to the private sector in Latin America is not growing as a result of remittances. Issues such as weak creditor rights, inefficient contract enforcement mechanisms, crowding out as a result of the government demand for credit due to fiscal pressures, and lingering effects of repeated crisis in LAC may also need to be considered and tackled by governments seeking to leverage the impact of remittances on financial development.
### Appendix Table: Are Remittance Recipients More Likely to Solicit and Receive Non-bank Credit? Probit estimations for El Salvador

#### Panel A: Likelihood of having outstanding non bank debt

<table>
<thead>
<tr>
<th></th>
<th>Including households surveyed two or more times</th>
<th>Including households surveyed four times</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Remittances Impact</td>
<td>0.022 (0.80) 0.022 (0.98) 0.020 (0.89) 0.014 (0.62)</td>
<td>0.018 (0.67) 0.017 (0.58) 0.018 (0.68) 0.010 (0.35)</td>
</tr>
<tr>
<td>Income</td>
<td>0.000 (0.35) 0.000 (0.02)</td>
<td>0.000 (0.62)</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>0.002 (0.12) 0.008 (0.47)</td>
<td>-0.004 (0.18) 0.016 (0.68)</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>0.016 (1.69)* 0.014 (1.42)</td>
<td>0.022 (1.91)* 0.022 (1.68)*</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>0.003 (0.95) 0.002 (0.82)</td>
<td>0.003 (0.75) 0.001 (0.37)</td>
</tr>
<tr>
<td>Observations</td>
<td>2500 2449 2500 2477 2475 2399</td>
<td>1704 1580 1704 1636 1636 1456</td>
</tr>
</tbody>
</table>

#### Panel B: Likelihood of applying for a non bank loan

<table>
<thead>
<tr>
<th></th>
<th>Including households surveyed two or more times</th>
<th>Including households surveyed four times</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Remittances Impact</td>
<td>-0.011 (0.47) -0.016 (0.68) -0.011 (0.47) -0.012 (0.51)</td>
<td>-0.021 (0.76) -0.025 (0.85) -0.021 (0.76) -0.031 (0.10)</td>
</tr>
<tr>
<td>Income</td>
<td>0.000 (0.21) 0.000 (0.47)</td>
<td>0.000 (0.10)</td>
</tr>
<tr>
<td>Agricultural Employment</td>
<td>0.006 (0.34) 0.010 (0.54)</td>
<td>-0.001 (0.05) 0.019 (0.76)</td>
</tr>
<tr>
<td>Rooms in Household</td>
<td>0.008 (0.83) 0.008 (0.72)</td>
<td>0.010 (0.83) 0.010 (0.77)</td>
</tr>
<tr>
<td>Household Schooling</td>
<td>0.003 (1.19) 0.004 (1.23)</td>
<td>0.005 (1.41) 0.005 (1.29)</td>
</tr>
<tr>
<td>Observations</td>
<td>2500 2449 2500 2477 2475 2399</td>
<td>1704 1580 1704 1636 1636 1456</td>
</tr>
</tbody>
</table>
Annex 1: Remittances and Bancarization - The Experiences of Colombia and Guatemala

This descriptive annex presents more details on banking practices related to remittances in two cases, Colombia and Guatemala, based on ad-hoc surveys and follow-up interviews carried out during April and May, 2006 at selected banks that have an important participation in the remittances market in each country. Other descriptive studies have also been incorporated. The objective is to complement the analytical findings of the chapter to: (i) illustrate the increasing interest of banks on the remittances market both on the deposit and, more recently, on the asset side, (ii) identify potential limitations reported by banks for the development of the banking sector and banking services based on remittances, and (iii) help better understand possible alternatives for overcoming these limitations in the near future.

The Colombian Experience

Survey responses and interviews with bank representatives reflect the increased interest and ongoing efforts to further engage in the remittances market, largely based on the size of the market and perceived potential for banking profitable clients. They report that as a result of these recent efforts, remittance recipients are increasingly opening bank deposit accounts, but they have been less effective thus far at converting remitters into clients, or at increasing credit (for both remitters and recipients).

In general, a first set of obstacles to deepen the banking system through remittances are related to the non-predominant share of banks in the remittance distribution market. There are several factors that help explain banks’ still secondary role in this market, including: (i) their relatively recent entrance in the market; (ii) image disadvantages as compared with their main competitors, foreign exchange houses; (iii) exclusivity agreements with international counterparts (mostly money transfer operators) that have a given (sometimes small) percentage of the remittances origination market and commit banks not to pay remittances of other businesses; (iv) slower customer service for remittance recipients compared to foreign exchange

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65 In the LAC region, Colombia and Guatemala are, respectively, the third and fourth largest remittance recipients in absolute terms. In 2005, Colombia received US$ 4,126 millions (equivalent to 4.1 percent of GDP) while Guatemala received US$ 2,993 millions (or 9.3 percent of GDP in relative terms) (IADB 2006 b).

66 Although interviewed banks represent an important percentage of the remittance market in each country, due to diversity among banking financial institutions and the informal nature of the surveys they may not necessarily be representative of the country or the region.

67 Notwithstanding data scarcity, Orozco (2006) estimates that Colombian banks have about 40 percent of this market, while foreign exchange houses represent about 47 percent. In this sense, Colombia differs from the weighted regional average (according to country volume), where banks are estimated to have greatest percentage of the remittance distribution market (close to 50 percent), followed by retail stores with approximately 38 percent (IADB 2006 a). It is worth noting that these market participation estimates are based on data collected by Orozco from 13 LAC countries and a total of 50 enterprises that offer money transfer services (Orozco 2006).

68 Banks started growing in the remittance retail distribution market after 2001.

69 Banks report the need to improve their own image to gain market share, as they believe the public perceives them to be excessively focused on profits and has some difficulty in trusting them with their funds.
houses; and (v) to a lesser extent, inadequate location of branches for targeting remittances recipients in the case of smaller banks.70

More recently, the ability of banks to ease some of these limitations and to develop new competitive advantages and exploit existent ones have allowed them to gain market share in the last few years.71 Banks have improved their image in the remittance market as their customers have had a positive experience with their services; signed agreements with non-financial businesses with a wide geographic penetration; and, in some cases, provided their clients with ATM cards to minimize payment waiting time. Additionally, banks report to have gained a competitive edge by offering financial services specially tailored to the market72 and decreasing exchange rate spreads; as well as exploiting existent advantages such as offering greater security73 and, for larger banks, a wide branch distribution network.

A second set of reported obstacles is directly related to the actual broadening of access to credit for recipients and remitters. These include limitations that are more specific to the remittance market and others that are typical of credit markets but have not yet been resolved by exploiting the characteristics of remittances flows. Among the former is the competition from non-supervised retail businesses as the reported preference for durable consumption goods seems to have provided an opportunity for retailers to provide direct credit. Banks argued that the interest rate ceilings they face by regulation has given an advantage to retailers, as the latter are not subject to these and can compensate higher risks by charging higher interest rates.74

Typical limitations in the credit market that are also relevant in the remittance market include: lack of information (insufficient credit history and payment behavior), inadequate risk and scoring models, low demand, and little collateral. Banks report constraints from low demand for credit, because they perceive remittances are mainly used for consumption purposes, to cover basic needs and purchase durable consumption goods.75 Although the predominance of consumption can limit credit demand, residual remittances available for saving and investment

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70 This refers to the actual withdrawal of remittances at banks' offices. As banks not always had separate customer lines to pay remittances, foreign exchange houses have been able to offer a faster service in some cases.

71 Although foreign exchange houses traditionally held most of the market, they have been loosing grounds to other businesses. In 2001 foreign exchange houses paid 95 percent of remittances, but their share declined to 81 percent in 2004 (Banco de la República de Colombia 2004). Moreover, Orozco (2006) estimates that their share declined to 47 percent by 2006.

72 The development of products adapted to the needs of the remittance market was at different stages in interviewed banks, but all report a large focus on this strategy. Some banks were already offering new products and getting positive results from this strategy, while others were still on the process of designing them.

73 This refers to the confidence that can be generated when a renowned bank is involved in the transaction and the greater personal security that can be enjoyed receiving the payment. As banks offer several services aside from money transfers, a client leaving from one of its branches might not be carrying cash and, therefore, is less likely to be victimized.

74 Nevertheless, the influence of retailers is limited by the fact that they can only provide credit for the products they sell and banks have the ability to further adapt their credit products.

75 This expenditure pattern could be explained, at least in part, by the fact that LAC migration tends to be longer-term as compared with other regions (see Chapter 2). Therefore, migrants and their families back home might not feel the urge to save in order to invest and lift their living standards upon the sender's return to the home country.
(and paying-off credit) may still be significant as compared with the saving capacity of non-recipient households.\footnote{This is the case in Guatemala, where remittances have a considerable impact on household income. Even when consumption goods constitute the main expenditure of recipient households, they still manage to save and invest more than non-recipient households.}

The problem of insufficient collateral in the case of remittance recipients emerges because many of them are unemployed and can only offer these transfers as collateral. In principle, remittances can serve as collateral since they can occur periodically through a sustained period of time and be sufficient to cover credit payments. Although interviewed banks were not yet offering credit by taking remittances as guarantee of payment, there are incipient efforts for change as some are tracking remittances and planning on using this information to offer credit to recipients.

Finally, a third group of identified obstacles for developing the financial sector are those related with remitters. Banks have found several difficulties for converting immigrants into clients and, more specifically, for being able to offer credit to them. First, banks found that these activities require building a new infrastructure in external markets with business partners that can absorb a relevant percentage of profits.\footnote{In fact one of the interviewed banks had launched a mortgage credit product for migrants but later withdrew it since profit margins were insufficient.} Also, increased competition for the distribution of remittances and the bancarization of recipients have led banks to focus their energy and resources in the domestic market.

Notwithstanding the limitations to convert remitters into clients, banks continue to perceive this group as an attractive business opportunity as many of them have not yet been “bancarized” by foreign competitors and are reported to be interested in saving, investing in their home country, and making sure that their transfers serve to lift the living standards of their families by granting them access to education, housing or supporting entrepreneurial activities. As a result, banks are increasing their efforts to take advantage of the perceived business opportunity.

The Guatemalan Experience

As in Colombia, in Guatemala the share of commercial banks in the retail remittance distribution market seems to have increased markedly in recent years (The World Bank 2006. forthcoming) and recipients have increasingly been converted into clients, although they participate mostly through banks’ liabilities rather than assets.\footnote{As Table 6 shows, while 30.7\% of beneficiaries hold saving accounts, only 0.57\% have bank credit.} On the other hand, the “bancarization” of remitters has also been limited by the small participation of banks in the remittance origination market.

Although data on the market structure of the retail distribution of remittances in Guatemala are particularly scarce and incomplete, estimates indicate that once small shops and other retailers are taken into account, Guatemalan banks do not have the largest percentage of the
However, the relevance of banks in the market has been increasing as limiting factors have eased and banks have exploited competitive advantages.

Among obstacles, Guatemalan banks report that exclusivity agreements have constrained their expansion in remittance distribution. These agreements have also hindered the bancarization of recipients by prohibiting banks to transfer remittances to recipients' bank accounts (both existing and new). This clause limits the benefits of holding saving accounts as it forces beneficiaries to go to the bank to receive their remittance payments, even if they already have an account. The prohibition also increases the costs of converting beneficiaries into customers as banks. In this process, banks need to assign an ID to remittance beneficiaries, track remittances history and link this information with the transactions that beneficiaries do as bank clients. This implies developing or purchasing compatible information systems to track information (one for remittances and another one for other transactions) and dedicating qualified personnel to analyze trends and explore opportunities for cross selling of other products. Nevertheless, the relevance of exclusivity features is decreasing as banks are broadening their agreements with other agents.

On the other hand, there are several elements contributing to the growth of banks in the remittance distribution market and deepened bancarization through remittances. A good example is the tailoring of products to the needs of remittance sector, such as the program *Los Chapines Estamos Unidos* of Banco Industrial, the largest commercial bank in Guatemala (see Annex 2). All banks interviewed are also making efforts to collect and analyze information on remittances transactions and beneficiaries, which should put them in a better position to take advantage of some existent but underutilized strengths.

The reported shift from informal towards formal transfers recently motivated by AML-CFT regulations that improve recording of official flows; banks broader range of financial services; and, in some cases, their relatively widespread branch network are also in favor of their growth in remittance distribution (The World Bank, 2006 forthcoming). The latter is particularly the case of two large banks in Guatemala with large rural networks in geographic regions that are large remittance recipients, which have only started to explore the potential for banking beneficiaries.

Regarding the potential growth of bank liabilities in the remittance sector, a 2004 survey conducted by the World Council of Credit Unions shows some encouraging evidence. Even when it is estimated that close to 70 percent of remittance recipients do not have bank accounts in Guatemala (see Table 5.6), 65 percent of the respondents expressed interest in depositing part of their remittances in financial institutions and saving 22 percent of their remittances (Mesbah-Khavari, Evans and 2005).

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79 Banks have about 23.5 percent of the remittance distribution market. Most of the market is held by retailers, who account for 72.8 percent of the business. Source: IADB (2006 a).

80 Larger banks with wide distribution networks that already target lower income individuals will probably be in a particularly good position to increase their participation by taking advantage of these features once they adapt their products and marketing to the remittance sector based on this information.

81 The World Council of Credit Unions, Inc. (WOCCU) conducted a survey of users of its International Remittance Network (IRnet) services at the five Guatemalan credit unions during the spring of 2004, covering 502 individuals (Mesbah-Khavari, Evans and 2005).
When interviewees of the WOCCU survey were asked about the reasons for not having a savings account in a financial institution, they mentioned they did not have enough income, were not used to save, had other more profitable investments, did not know how to do it, or believed they did not meet the requirements (Mesbah-Khavari, Evans and 2005). Among others, these limitations could be minimized by further adapting deposit services to remittances beneficiaries needs (e.g. eliminating management costs, offering attractive interest rates, and lowering minimum required balance) and explaining the requirements for opening an account.

Competition from informal credit providers and lack of demand and collateral have been obstacles for granting credit to Guatemalan remittance recipients. The WOCCU survey found that: (i) at the overall sample level, 35% of remittance recipients' households were using credit in 2003; (ii) most loans were provided by informal sources (informal moneylenders, supplier credit, friends or relatives); and (iii) most remittances beneficiaries do not apply for credit as they lack collateral and fear their applications will be denied (Mesbah-Khavari, Evans and 2005). Credit demand is also influenced by recipients' preferred distribution of income as Guatemalans primarily use their remittances to cover basic household expenditures rather than to invest in business, agriculture or residential property.\textsuperscript{82}

There are, conversely, some elements that can lead to credit growth in the remittance sector. The fact that recipients are already using informal credit raises the opportunity to increase formal credit for beneficiaries by offering better terms, if collateral and lack of sufficient credit history can be addressed through remittances. Guatemalan banks are starting to take advantage of remittances to solve the typical limitations of access to credit for low income individuals as they are now using proven patterns of stable remittances flows during a given period of time as a positive factor when assessing credit risk of potential clients. Finally, even when Guatemalans recipients assign the biggest portion of their remittances to consumption, their ability to save and invest is bigger than non-recipient households as the effect of remittances on income is considerable.

\textsuperscript{82} According to a recent USAID survey, remittance recipients spend 56 percent of remittances on covering basic needs, while the remaining 44 percent is distributed among health and home investments and debt repayment.
Annex 2: Tailoring Financial Products to the Needs of the Remittance Market

The following paragraphs provide examples of financial products that have been designed by Latin American financial institutions to satisfy the particular needs of remittances senders and recipients. These examples seek to highlight the distinctive and innovative features of these products rather than to provide a detailed description.

- **Banco Solidario: gaining market share through product adaptation**

Banco Solidario is a key player in the Ecuadorian remittance market. Even when it entered the market fairly recently (2002), it has managed to rapidly gain participation in the remittance retail distribution business by providing remittance senders and beneficiaries with savings and credit products tailored to their needs (Orozco and Fedewa 2005) and establishing strategic alliances with international banks in several countries (most importantly saving banks in Spain). 83

Remitters who hold saving accounts at Banco Solidario are waived transfer fees (since December 2003) and have the option of designating beneficiaries who can withdraw funds in their home country. Saving accounts have low costs and allow the customer to have funds available upon request and a saving plan that lets clients decide how much to save each month and for how long. 84

Banco Solidario also offers mortgages and loans to migrants and their families with several innovative features. Mortgages are sold to migrants through a network of sale offices in Spain and Italy, have low saving requirements 85, and a minimum down payment of 30% (Dorham 2005). Relatives of the remitter can also apply for a similar mortgage by showing proof of the last three remittances received from Spain (Dorham 2005). Beneficiaries who receive their remittances from Spain can also apply for loans of up to US$ 5,000 by demonstrating they are receiving remittances, even when they are client of other financial institutions. Banco Solidario also offers loans to remitters of up to US$ 10,000, that can be used for several purposes (e.g. migration travel costs, improvement of micro-enterprises and housing).

- **Banco Salvadoreño: reaching senders**

Banco Salvadoreño has opened several branches in the US to reach senders. So far, the institution has seven agencies in the US cities with the higher concentration of Salvadorian

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83 These alliances with saving banks (cajas de ahorro) have formed a network, called “Red de Servicios Financieros a Emigrantes”, that includes more than 9,000 outlets in Spain (see http://www.banco-solidario.com/noticia.php?not1ID=5). Through these network, migrants in Spain transferred $120.4 million in the three years through July 2005, and they deposited $7.8 million, or 6% of that figure, into savings accounts (Derham 2005).

84 Administrative costs are $1.50 for accounts if the average balance is smaller than $300.

85 Initial savings for mortgages can start at $40.
migrants.\footnote{These are Los Angeles, Santa Ana, San Francisco and Van Nuys in California, Houston (Texas) and Las Vegas (Nevada).} This has allowed the bank to charge competitive fees for transfers and migrants to transfer funds directly to beneficiaries’ savings account, capturing 12 per cent of El Salvador’s remittance market (Orozco and Fedewa 2005).

Financial products have also been adapted to the needs of Salvadorian remitters and recipients, who are given preferential treatment to facilitate the establishment of a long-term relationship (Orozco and Fedewa 2005). In particular, the bank has developed a mortgage product line for remitters, which offers three products according to the legal status of the migrant (i.e. legal residents, work-permit holders and undocumented).\footnote{Undocumented migrants are offered shorter term mortgages and are not required to present documentation to prove their legal status in the US, remittances history and tax declarations.} Mortgages to acquire homes (used or new) take the property as collateral and can finance up to 90\% of the value of the house for a maximum term of 15 years. Mortgages to acquire lots also take the property as collateral but can finance up to 70\% of the value for a maximum term of 10 years.

- **Banco Industrial: tailoring credit to recipients**

Banco Industrial (BI), the largest Guatemalan bank, has developed the “Los Chapinos Estamos Unidos” (Guatemalans Are United) program, which includes money transfer, saving, and credit services tailored to the needs of the remittance market. The program’s saving and credit services are mainly sold to remittances recipients.

Credit products consider the recipient’s remittance history to assess risk and determine the maximum loan amount (70 percent of remittance average) and are generally short-term (maximum of 2 years). BI offers two credit products within its “Los Chapines Estamos Unidos” program: Los Chapines Estamos Unidos Loan and Remittances in Advance. While the former offers a 2 percent monthly interest rate and a longer term (6 to 24 months), the latter carries higher interest rates (4 to 6 percent) and a maximum term of 3 months.

- **Bansefi: networking to reach economies of scale and underserved areas**

Bansefi (Banco de Ahorro Nacional y Servicios Financieros - National Savings and Financial Services Bank) is a public development bank created as part of a governmental strategy designed to upgrade the Popular Savings and Credit Sector, which is formed by semi-informal and informal financial intermediaries that serve unbanked areas (De la Torre, Gozzi and Schmukler 2006).\footnote{Bansefi was established through an organic law, sanctioned by congress in April, 2001, which mandated the transformation of the existent Patronato del Ahorro Nacional (PAHNAL).} The strategy seeks to support these institutions to increase financial sector deepness and promote access to financial services by lower-income individuals through a networking model that links financial intermediaries to support common activities and reach economies of scale (Coutinho 2006).

Bansefi administers “L@ Red de la Gente” (The People’s Network), a strategic association among the bank and financial institutions belonging to the Popular Savings and Credit Sector, which is facilitating the “bancarization” of underserved sectors (i.e. lower and
middle income individuals). Aside from exploiting operational and commercial economies of scale\footnote{Economies of scale are sought by providing an internet based financial services network and a trademark for the products of the Net members.}, L@ Red de la Gente performs activities directly related to remittances, including: (i) negotiating fees with foreign banks and transfer companies to lower transfer costs; (ii) channeling the transferred funds; and (iii) attracting senders and beneficiaries to open saving accounts that generate financial records (Coutinho 2006).

- **Peru: mortgages for recipients.**

  Fondo MIVIVIENDA, a Peruvian public fund that provides housing finance through private institutions, modified one of its products (Crédito MIVIVIENDA) to facilitate access for remittances recipients. Currently, close relatives of Peruvian immigrants that meet specified requirements can request a mortgage to the private banks that participate in the program and their remittances are considered as part of their income to lower their risk profile.

  In order to qualify, all recipients must have received and deposited in their accounts a monthly remittance that should not be smaller than the monthly payments of the desired mortgage for a period of six months. In turn, private financial institutions that belong to the program define other requirements for remitters and recipients and can tailor their products to the needs of their clients. For instance, Banco de Crédito has developed the product “MIVIVIENDA con Remesas” that offers three different mortgages, two for recipients that have an additional source of income (Plans 1 and 2) and one for direct relatives of remitters that have remittances as their sole source of income (Plan 3). While Plan 1 requires saving for 12 months and a minimum down payment of 10%, Plan 2 requires saving for 6 months and a minimum down payment of 20%. Finally, Plan 3 offers two options: saving for 9 months (with a minimum down payment of 30%) or saving for 12 months (with a minimum down payment of 20%).
Chapter 6

Remittances, the real exchange rate, and the Dutch Disease phenomenon

So far, this report has been arguing that the more remittances a country receives, the higher its welfare level. Yet, flows that are too large relative to the size of the receiving economies, as those observed in a number of Latin American countries, may also bring a number of undesired problems. Among those probably the most feared in this context is the Dutch Disease. This chapter explores the empirical evidence regarding the impact of remittances on the real exchange rate. Do countries with high remittance flows experience losses of competitiveness due to a real exchange rate appreciation? Should policy makers react to this potential phenomenon? If so, what are the options that they have to address this concern?

I. Introduction

In the previous chapters we have argued that remittances may have a number of beneficial effects for the welfare of the receiving countries. The evidence presented so far in this report (see Chapter 3) suggests that at the country level higher remittances inflows tend to be associated with lower poverty indicators and higher growth rates. Beyond these typical income dimensions of welfare, remittances seem to reduce output volatility (a measure of risk faced by countries90), and at least in some countries and for some socio-economic groups lead to improvements in social indicators (chapter 4). Yet, the magnitude of these flows relative to the size of the receiving economies91 implies that remittances may also pose an important number of challenges. For while these inflows may ease external financing constraints and therefore hold the potential for higher investment by developing countries, in many circumstances remittances

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* This chapter is based on the background paper for this report “Remittances and the real exchange rate: Are there reasons to be concerned about Dutch Disease in Latin America?” by Humberto Lopez and L. Molina.
90 See Perry, Arias, Lopez, Maloney and Serven (2006) for a discussion of non-monetary dimensions (including risks considerations) of welfare.
91 Recall that as discussed in Chapter 1, there are a number of Latin American countries where remittances are above 10 percent of GDP and in the case of Haiti they reach almost 40 percent.
are so large that they can impact macroeconomic stability and more specifically carry a potential for Dutch Disease type of phenomena (see the International Monetary Fund’s *World Economic Outlook* 2005, and the *World Bank’s Global Economic Prospects* 2006).

Workers remittances can be viewed as a capital inflow, and therefore the theory on the Dutch Disease phenomenon associated to surge in inflows (perhaps because of a discovery of new natural resources) can also be applied in this context. Very briefly, the rationale for a Dutch Disease type of effect would be as follows. Remittances have a positive impact on the incomes of receiving households, and hence they will also tend to positively affect consumption. To the extent that some of this consumption is directed towards the non tradable sector where competition is likely to be somewhat limited, remittances will tend to drive up the price of non tradable goods relative to that of tradables and therefore contribute to a real exchange rate appreciation. Obviously, the pressure on the real exchange rate will be somewhat mitigated if (i) there are productivity gains, particularly in the non tradable sector, that offset the effects of the increasing demand; and/or (ii) a large share of the remittances is channeled to the external sector via additional imports so that the price effect on non tradable goods is limited. Yet in principle it seems difficult to justify that these effects are enough to mitigate appreciating pressures.

In turn, there are a number of additional macroeconomic effects that can result from a real exchange rate appreciation associated to remittances flows. They include the following:

- **Adverse effects on the tradable sector of the economy.** Although remittance flows are likely to lead to an expansion of the non tradable sector (as a result of the increase experienced in the domestic demand), both export and import-competing industries (i.e. the tradable sector of the economy) would be adversely affected by the real exchange rate appreciation and the associated loss of international competitiveness. The negative impact of remittances on the tradable sector may be reinforced if they also fuel inflation and higher prices result in higher economy-wide wages. This effect would further be magnified if as argued in Chapter 4, remittances also reduce the labor supply. In these circumstances, the non tradable sector may be in the position of passing onto prices some of the wage pressures, but this is likely to be much more difficult for a tradable sector facing international competition which as a result will lose competitiveness.

- **Widening of the current account deficit.** In principle, it is difficult to justify that an increase in the domestic demand will be passed in full to the non tradable sector. So, to the extent that some of the remittances-induced-consumption is directed towards tradable goods, there will be an increase in the demand for imports. This coupled with the losses of international competitiveness of the domestic firms mentioned in the previous paragraph would likely result in deteriorations of the external position. For example, according to World Bank (2003) the surge in remittances observed in El Salvador during the 1990s was the most likely factor behind the worsening of the country’s trade deficit which over the 1990s deteriorated from less than 7 percent of GDP to almost 14 percent of GDP.

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92 For example, FUSADES, a Salvadoran think-tank puts the share of remittances consumed in that country at about 70 percent.
93 This is a typical result of economic models with labor mobility.
• Weaker monetary control, inflationary pressures, and the sectoral allocation of investment. If remittances flows do not leave the country through a widening of the current account, large flows will push up monetary aggregates, potentially derailing inflation targets. Experience also indicates that prices of financial assets and particularly of real estate can rise rapidly following a surge in remittances, something that in turn may introduce significant distortions in the economy and affect the sectoral allocation of investment and lead to overinvestment in some sectors (i.e. real estate).

On the whole, the previous discussion highlights a number of problems that policy makers may have to face in the context of a surge in remittances. True, to the extent that these Dutch Disease phenomena are part of the natural adjustment process towards a new equilibrium, they should not be a matter of particular concern for policy makers. Indeed, if we view remittances as a positive shock to the economy, then the real appreciation and related effects experimented by the receiving country would simply be part of the inevitable relative price adjustment process that goes with favorable shocks. Yet if this real appreciation is very dramatic, or the adjustment process towards the new equilibrium is uneven (i.e. not fully consistent with the change in economic fundamentals at each point in time) policy makers may wish to mitigate, to the extent possible, its adverse effects on export industries.

In principle, one could also mention two additional reasons of concern for policy makers that are usually mentioned in the context of surges of capital inflows. One is the potential for a flow reversal over the medium run. This is important because if there is hysteresis in the real sector, a real exchange rate appreciation may wipe out important sectors of the economy that would not reappear even if the currency subsequently depreciates. The other potential concern is a very sudden appreciation that cannot be accommodated and therefore brings a very painful adjustment. However, it must be noted that the documented stability and counter-cyclicality of remittances would lead one to assume that the probability of short-run reversals or sudden adjustments is quite low, leaving as main reason for concern the magnitude of the real appreciation associated to the remittance inflows.

Against this background, what does the economics literature has to say about the evolution of the exchange rate in countries that have experienced important increases of remittances? The truth is that the existing empirical literature is very limited and less than unanimous. For example, Amuedo-Dorantes and Pozo (2004) rely on cross country econometrics techniques and find that in a sample of 13 Latin American countries a doubling of workers remittances would lead on average to a real exchange rate overvaluation of about 22 percent. This estimate would be robust to the presence of fixed effects in the data, and to the use of IV estimation techniques to account for reverse causality from the exchange rate to remittances.

However, Rajan and Subramanian (2005), who rely on a cross national dataset of 3-digit industry value added growth data to explore whether remittances have a differential impact

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94 The stability of remittances over time is one of the most important differences between remittances and other types of capital inflows. In fact, as noted by the World Economic Outlook 2005, non-FDI private capital flows, exports, FDI, and even official aid all show greater volatility than remittances.

95 The countries in their sample are: Argentina, Belize, Bolivia, Colombia, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Peru, and Trinidad & Tobago.
depending on the labor intensity of the different industries, find that unlike other types of capital
flows (particularly aid flows) remittances do not seem to have a negative impact on external
competitiveness. Rajan and Subramanian (2005) argue that this could be the result of remittances
being directed to a large extent towards unskilled-labor intensive activities – e.g. goods and
services provided by micro-enterprises – and/or tradable sectors such as manufacturing, and thus
having limited effects on the prices of skilled labor and other relatively scarce resources.

This chapter addresses these issues and contributes to the existing limited literature along
several dimensions. First, it discusses the different channels through which remittances can affect
the real exchange rate using a framework where the equilibrium exchange rate is characterized
by an external equilibrium similar to those analyzed in asset market models (Mussa, 1984 and
Frenkel and Mussa, 1985) and an internal equilibrium based on a productivity differential model
as those in Balassa (1964) and Samuelson (1964).

Second, it provides estimates of the impact of remittance flows on the real exchange rate
using a large cross national data set rather than information for a limited number of countries.
Our approach allows testing whether there are regional differences and more specifically whether
Latin America is different in this context. Note that one of the main differences between the
work of Amuedo-Dorantes and Pozo (2004) and Rajan and Subramain (2005) is the coverage of
the data. Thus if the impact of remittances on the real exchange rate is different in Latin
American than in the rest of the world, then the different findings of Amuedo-Dorantes and Pozo
(2004) and Rajan and Subramain (2005) should not be surprising. In fact, to anticipate some of
the results in Section IV, this chapter argues that although remittances flows do not appear to
affect the real exchange rate in countries outside of Latin America, in this region they are likely
to contribute to a significant real exchange rate appreciation. These results are robust to the
presence of fixed effects in the data, potential reverse causality from the exchange rate to
remittances, and variations in the set of control variables.

Third, the chapter also explores the extent to which the estimated appreciation in Latin
America is consistent with the change in economic fundamentals implied by the increase in
remittances or instead whether it can be attributed to changes in the misalignment component of
the real exchange rate (i.e. changes in the underlying real over/undervaluation of the currency).
To also anticipate our results on this, we find that the evolution of the Latin American real
exchange seems to be driven by a combination of changes in the equilibrium real exchange rate
and changes in the degree of misalignment.

Finally, on the basis of its empirical results the chapter discusses a number of options for
policy makers concerned with the impact that a surge in remittances may have on the external
competitiveness of the country. The rest of the chapter is organized as follows. In Section II we
consider an additional number of theoretical considerations that may explain why remittances
may lead to a real exchange rate appreciation and review the evolution of remittances, the real
exchange rate, exports and imports for the 8 largest receivers of remittances (as a percentage of
GDP) in Latin America. Section III reviews the empirical strategy used to assess the impact of
remittances on the real exchange rate. In Section IV, we present the results of estimating two
econometric models. One relates changes in the real effective exchange rate to the ratio of
remittances to GDP. The second uses as explanatory variable the changes in a measure of real
exchange rate overvaluation. The basic idea here is trying to disentangle how much of the observed changes in the real exchange rate are due to changes in the equilibrium exchange rate and hence consistent with the evolution of economic fundamentals. Finally Section V closes with some conclusions and a review of policy options.

II. Remittances and the real exchange rate.

Theoretical considerations

Remittances can potentially affect the real exchange rate through three main channels (see the technical annex for a formal discussion). First, remittances may affect the external equilibrium of the economy by raising the net foreign asset position of the country. For example, the theoretical models of Mussa (1984), Frenkel and Mussa (1985), Alberola and Lopez (2001) and Aberola et al. (2002) imply that the external equilibrium of the economy will be reached when any current account imbalance is compensated by a sustainable flow of international capital. In turn, the rate of sustainable capital flows will be a function of the stock of foreign assets and liabilities of the economy, so that changes to the net foreign asset position of the country will lead to changes in the real equilibrium exchange rate.

Given that international remittances are transfers of foreign currency that unlike other types of international flows have no obligation associated, remittances will have a direct impact on the net financial position of the country vis-à-vis the rest of the world. Note in this regard that the impact of remittances on the stock of net foreign assets differs from the impact of other flows such as loans or foreign direct investment flows. In the case of a loan, there is an associated liability (the repayment) and therefore the contribution to the net foreign asset position of the country is given by the difference between the proceeds and the net present value of the repayment obligations. In this regard, loans will positively affect net foreign assets to the extent that they have a positive grant component. On the other hand, foreign direct investment flows coming into the home country will increase the foreign liabilities and therefore, will lead to a decline of the net foreign asset position.

Second, remittances can also affect the internal equilibrium of the economy understood as the situation where domestic capital and labor are efficiently utilized. If as discussed above, remittances lead to an acceleration in the demand for services, inflation will tend to be higher in these sectors which typically are not tradable (and hence somewhat protected from competition) leading to a real exchange rate appreciation (the traditional Balassa-Samuelson effect). Similarly, market rigidities may result in productivity differentials between sectors. For example, if remittances raise the reservation wage, then excessive wage pressures in the tradable sector may lead to employment adjustments to maintain competitiveness, whereas in the non-tradable sector employers may admit these pressures because they can pass them onto prices. As a result, remittances can also lead to higher productivity growth and lower inflation in the tradable sector through their potential impact on the reservation wage. One implication of this discussion is that whether remittances are primarily used for household consumption or investment purposes will have a direct impact on the way they affect the real exchange rate, with remittances that are
predominantly consumption oriented having more of an appreciating impact on the real exchange rate.

A third possibility for remittances to affect the real exchange rate is through their impact on growth (see Chapter 3 for evidence in this regard), although in this case the impact on the exchange rate is likely to be uncertain. On the one hand, an acceleration in the growth rate would lower the stock of net foreign assets as a percentage of GDP and hence this would lower the real exchange rate (i.e. growth would have the same impact as an increase in the liabilities of the country). If on the other hand, the net foreign asset position of the country is negative vis a vis the rest of the world, the increase in the rate of growth would lower the liabilities to GDP ratio and hence lead to an appreciation.

On the internal front, faster growth would be associated with a real exchange appreciation. Higher growth would lead to higher internal demand and the mechanism described above in the description of the internal adjustments will apply (i.e. the Balassa-Samuelson argument). Thus on the whole, the impact of a growth acceleration could go in either direction or even cancel each other and have no impact.

How do the data look like?

We now move beyond the theoretical considerations just discussed and focus on the data. Table 6.1 reports the (annualized) change in the (log) real exchange between 1990 and 2003 for a number of Latin American countries, together with the initial and final levels of remittances (in percent of GDP). The remittances data are the same we have been using throughout the report. The real effective exchange rate is from the IMF’s *International Financial Statistics* and it is defined as the relative price of domestic to foreign goods, so that increases imply a real exchange rate appreciation. Table 6.1 indicates that over 1990 and 2003 the real effective exchange rate appreciated in 11 of the 20 countries under consideration. The countries where it appreciated the most are Belize, Ecuador, El Salvador, Guatemala, and Haiti. Interestingly, Ecuador, El Salvador, Guatemala, and Haiti are among the top receiver countries of remittances of the region (as percentage of GDP). Other countries where the real effective exchange rate appreciated over the period under consideration by at least 1 percent per year on an annual basis are Honduras, Jamaica and Mexico. The first 2 of those are also among the countries of the region with a high remittance to GDP ratio, whereas Mexico is the country with the larger remittances flows of the world.

Figure 6.1 presents similar information but now restricting the sample to the 8 Latin American countries with the largest remittances to GDP ratio in 2002. Even though we should stress that this figure can only provide evidence of unconditional correlations, it is suggestive of a positive relationship between the evolution of remittances and the real effective exchange rate. In fact in most of the 8 countries in the figure it is possible to observe a real exchange rate appreciation in parallel to an increase in the remittances to GDP ratio. The first apparent exception to this rule would be Nicaragua, where the evolution of the real exchange rate over the early 1990s and 2000s appears to move in the opposite direction to what one could expect. The second exceptions are given by Ecuador and the Dominican Republic, where marked real depreciations followed the crisis of 1999 and 2002, respectively, at a time when remittances were
increasing substantially. However, in the case of the Dominican Republic the real exchange rate and the remittances to GDP ratio also moved in parallel before 2002.

### Table 6.1. Remittances and the real exchange rate.

<table>
<thead>
<tr>
<th>Country</th>
<th>REER 1/ Growth</th>
<th>Remittances 2/ Initial</th>
<th>Remittances 2/ Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>-1.6</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Belize *</td>
<td>32.6</td>
<td>3.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Bolivia</td>
<td>-0.3</td>
<td>0.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>-5.3</td>
<td>0.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Chile</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Colombia</td>
<td>0.5</td>
<td>1.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.3</td>
<td>0.2</td>
<td>1.8</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>-0.4</td>
<td>5.0</td>
<td>12.7</td>
</tr>
<tr>
<td>Ecuador</td>
<td>3.0</td>
<td>0.5</td>
<td>5.7</td>
</tr>
<tr>
<td>El Salvador</td>
<td>3.4</td>
<td>7.4</td>
<td>16.1</td>
</tr>
<tr>
<td>Guatemala</td>
<td>3.3</td>
<td>1.6</td>
<td>8.7</td>
</tr>
<tr>
<td>Haiti</td>
<td>3.0</td>
<td>2.7</td>
<td>41.2</td>
</tr>
<tr>
<td>Honduras</td>
<td>1.1</td>
<td>2.1</td>
<td>12.5</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1.0</td>
<td>4.4</td>
<td>17.7</td>
</tr>
<tr>
<td>Mexico</td>
<td>1.8</td>
<td>1.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Nicaragua **</td>
<td>-1.3</td>
<td>0.5</td>
<td>10.6</td>
</tr>
<tr>
<td>Panama</td>
<td>-1.2</td>
<td>0.3</td>
<td>0.7</td>
</tr>
<tr>
<td>Paraguay</td>
<td>-1.6</td>
<td>0.6</td>
<td>3.7</td>
</tr>
<tr>
<td>Peru</td>
<td>-0.6</td>
<td>0.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Venezuela ***</td>
<td>-1.5</td>
<td>0.1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

1/ percent
2/ percent of GDP
Initial Period is 1990 and Final Period is 2003
* Belize Initial Period=1990, Final Period=2002
** Nicaragua, Initial Period=1992, Final Period=2003
*** Venezuela, Initial Period=1997, Final Period=2003
Source: Author's calculations.

Note also that in some of the other countries the observed real exchange rate appreciations have been quite dramatic. For example in Ecuador, El Salvador, Guatemala, and Haiti, over the 1990-2003 period the real exchange rate appreciated by about 40 percent. In the cases of Honduras and Jamaica the recorded appreciation is more modest but it would still be in the 20 percent range.

In Figure 6.2 we now compare the evolution of the real exchange and the volume of exports of goods and services. The figure indicates that the only countries where export volumes have significantly increased over the 1990-2003 period are El Salvador, a country where exports increased from about 19 percent of GDP in 1990 to close to 30 percent in 2003, and Ecuador where exports increased by almost 20 percentage points to close to 55 percent of GDP. In Honduras, and Nicaragua export volumes would have been more or less stable over this period oscillating between 30 and 40 percent of GDP in the case of Honduras and hovering around 25 percent in the case of Nicaragua (although with a large variance). In the rest of the countries...
under analysis, we observe declines in export volumes which in some cases have been quite dramatic. For example, in Guatemala and Jamaica export volumes have fallen over the period under analysis by about 10 percentage points of GDP.

**Figure 6.1. Remittances and the real exchange rate**

Note: increases in the REER index indicate a real appreciation. Source: Author’s calculations.
Note: increases in the REER index indicate a real appreciation. Source: Author's calculations.
As for the evolution of imports, figure 6.3 indicates that over the 1990-2003 there is only 1 country where the imports to GDP ratio fell (Ecuador). In the other 7 countries under analysis imports increased. True in some countries like Guatemala, Jamaica and Nicaragua only slightly
(by less than 10 percentage points of GDP), but in the cases of Honduras and Haiti the increase has been quite marked: 15 percentage points of GDP in Honduras and close to 30 percentage points of GDP in Haiti.

Overall, the previous figures would indicate that in general increases in remittances have been accompanied by real exchange rates appreciations, and these in turn by declines in exports and increases in imports, elements that could be taken as a lose of competitiveness. The next section explores whether the empirical evidence is also supportive of some causality from development on the remittances front to the evolution of the real exchange rate.

III. Empirical strategy.

Empirical model

To explore the existence of causal links between the real exchange rate and remittances in the data, we rely on the following regression model:

\[ \Delta q_{it} = \omega' x_{it} + \beta R_{it} + \nu_i + \nu_{it}, \]  

where \( q \) is the log of the real effective exchange rate, \( \Delta \) is the first difference operator (such that \( \Delta q = q_t - q_{t-1} \)), \( R \) is a measure of remittance flows (in the case of this paper the remittances to GDP ratio), \( x \) represents a set of control variables, which we shall discuss shortly, \( \nu_i \) is a country-specific effect, and \( \nu_{it} \) is an i.i.d. error term. In (1) \( i \) and \( t \) are a country and a time index respectively.

Our primary focus is the estimate of \( \beta \) in equation (1). If remittances lead to a real exchange appreciation we should find that \( \beta > 0 \). If, however, remittances have no impact on the real exchange rate then we should find \( \beta = 0 \). Although it is theoretically possible here we do not consider the possibility of \( \beta < 0 \), since this would imply that remittances contribute to real exchange rate depreciation. (See the technical annex for a discussion)

The previous model can easily be extended to allow remittances to have a different impact in Latin America and in the rest of the world by simply adding and additional regressor to the specification in equation (1):  

---

96 Recall that as argued above increases in \( q \) correspond to a real exchange rate appreciation.
97 In this context, it seems more appropriate to work with the remittances to GDP ratio than with for example remittances per capita. The reason is that in principle one would expect that the real exchange rate is more affected when remittances are large relative to the size of the economy than when they are large relative to the population.
98 This however would require that the main effect of remittances on the exchange rate is through the growth channel described above and that the country has a positive net foreign asset position.
99 This can occur if regional migration flows patterns are different and as result migrants remit for different purposes. Once again remittances that result in higher consumption will likely lead to an appreciation of the real exchange rate whereas remittances that lead to higher investment may have less of an effect.
\[ \Delta q_u = \omega' x_u + \beta_1 R_u + \beta_2 R_u \times lac + \nu_i + \nu_u, \]  

(2)

where \( lac \) is a dummy variable that takes a value of 1 if the country in question is in Latin America and 0 otherwise.

One additional issue that needs attention is the specific set of control variables that are included in \( x \). Here we follow to a large extent the strategy in Amuedo-Dorantes and Pozo (2004) and consider the terms of trade, government expenditure, the world real interest rate, and GDP per capita income. These variables would capture respectively the effects of potential external shocks, fiscal policy differences, changes in external financial conditions, and productivity gains.\(^{100}\)

Despite the broad similarities between equations (1) and (2) and those estimated by Dorantes and Pozo (2004) there are a number of important differences. First, our results are based on a large cross national dataset rather than on a limited number of countries (in the case of Dorantes and Pozo, 2004, 13 Latin American countries). As argued previously if Latin American migration patterns are different from those of other regions (see Chapter 2 for a discussion on this issue), this could also be reflected in a differentiated effect of remittances on the real exchange rate.

Second, we focus on changes in the exchange rate rather than on its levels. The reason for this is that since the real effective exchange rate variable is an index, it is no possible to make cross country comparisons on the basis of the levels of the variable.\(^{101}\) Fixed effects estimation can somewhat mitigate this problem but it is not likely to fully address it in a satisfactory way. Note that this lack of cross country comparability also prevents us from estimating dynamic models for the real exchange rate where for example the changes in the variable of interest are related in addition to a control set, to the lagged endogenous variable so that one can capture mean reverting forces. The need to work with the first difference of the real exchange rate in turn implies that it is probably more appropriate to work with transformations of the original explanatory variable set. For example, rather than working with the levels of the terms of trade we work with their changes. Similarly, rather than working with GDP per capita we work with GDP growth rates.

A third difference with respect to Amuedo-Dorantes and Pozo (2004) is that we explore whether the results are robust to excluding GDP growth from the specification. The reason for this is that if remittances affect per capita growth and growth in turn affects the real exchange rate either \( \text{à la} \) Balassa-Samuelson or as in portfolio models, then econometric models that control for the evolution of income levels will not capture the full impact of remittances on the exchange rate (i.e. these models will produce results that are biased).

\(^{100}\) The remittances data are as in Aggarwal, Demiguc-Kunt, and Martinez Peria (2005) and the data come from the IMF’s World Economic Outlook 2005 database. As for the rest of the variable, the terms of trade and per capita growth variables come from the World Development Indicators database, government consumption is from the World Economic Outlook 2005 database, and the world real interest is computed using the US interest rate (6-month) and US producer price index from the International Financial Statistics.

\(^{101}\) For example, the base year all the countries in the sample will have the same value, say 100; clearly, this does not imply that the real exchange rate level is comparable among them.
Fourth, our variable of interest is the remittances to GDP ratio whereas Amuedo-Dorantes and Pozo (2004) use remittances per capita. We believe that our choice is more appropriate in this context since it is likely to better capture the importance of remittances flows relative to the size of the economy.

Finally, we also explore the extent to which the results for the real exchange rate are driven by changes in fundamentals and changes in the disequilibrium level. In this regard, we also present the results of a regression model that has as dependent variable an index of overvaluation based on Dollar (1992). To better understand the idea here, consider the following decomposition of the real exchange rate:

\[ q_{it} = \bar{q}_{it} + \hat{q}_{it} \]  

(3)

where the bar on top of the variable indicates that an equilibrium value and the hat indicates a disequilibrium value. Then our strategy is based on the following regression:

\[ \Delta \hat{q}_{it} = \kappa' x_{it} + \delta R_{it} + \eta_i + u_{it}. \]  

(4)

Note that same simple manipulations of (1), (3) and (4) yield

\[ \Delta \bar{q}_{it} = \Delta q_{it} - \Delta \hat{q}_{it} = (\kappa - \omega)'x_{it} + (\beta - \delta)R_{it} + \text{error}, \]

so that from those regressions it is possible to recover the impact of remittances on the real equilibrium exchange rate.

Econometric issues

One problem that has to be faced before proceeding with the results of the estimation is the potential reverse causality from the real exchange rate to the remittances. Rajan and Subramanian (2005) note that countries that had overvalued exchange rates in the early 1990s received significantly lower remittances during the rest of the decade, and argue that it is plausible that if emigrants perceive an overvalued exchange rate, they may switch to sending goods directly. Similarly, emigrants can find more attractive sending remittances home following devaluation. In this regard, the expected positive causal relationship from remittances to the real exchange rate can be contaminated by a possible negative causal relation from changes in the real exchange rate to remittances.

To somewhat address the potential reverse causality one can resort to IV estimation techniques and follow Aggarwal, Demirguc-Kunt, and Martinez Pería (2005) who propose two instruments for remittances: the level of output per capita of the host countries of migrant workers weighted by (i) distance between sending and receiving country and (ii) share of migrants of the receiving country in the sending country. In the empirical section below we use as instruments the (logged) levels and first differences of these two variables.
IV. Results

Remittances and the real exchange rate

We start this section by presenting results corresponding to equation (1) under the restriction that the GDP growth rate does not enter in the equation, so that if remittances affect the exchange rate though their impact on growth this specification should capture their full impact. Below we also explore the results when we add per capita growth to the regressor set. The estimates in Column (I) of Table 6.2 would suggest that indeed remittances would lead to a real exchange rate appreciation. Judging from point estimates, this basic model indicates that a 1 percentage point increase in the remittances to GDP ratio would lead to a real effective exchange rate appreciation of 1.5 percent. Thus a doubling of the remittances to GDP ratio would lead to a real exchange rate appreciation of 3 percent. This estimate is much lower than the estimate of Amuedo-Dorantes and Pozo (2004), which as noted above would be slightly above 22 percent.

The estimates for the rest of the variables in this specification carry the expected signs and all are statistically different from zero. As discussed above, higher interest rates and improvements in the terms of trade would in principle be associated with a higher real exchange rate. Regarding higher government consumption, it would not be unreasonable to assume that it will fall disproportionately on non-tradables and therefore, ceteris paribus, lead to an appreciation of the exchange rate on the basis of Balassa-Samuelson considerations.

Column (2) reports the results of extending the previous basic model as in equation (2); that is, it reports the results of a model that allows remittances to have a different impact on the real effective exchange rate in Latin America and in the rest of the world. With this specification the estimates of the impact of remittances on the real exchange rate are much less accurate than in the previous model. For example, neither the parameter of remittances nor that of remittances interacted with the Latin American dummy is now significantly different from 0. Yet, the p-value (.02) of the null that in Latin America remittances do not affect the real exchange rate (i.e. the null that the parameter of remittances plus the parameter of remittances interacted with the Latin American dummy equals 0) indicates that this hypothesis should be rejected. In other words, the result that remittances lead to a real exchange rate appreciation seems to be driven by the Latin American countries in the sample and it could be possible that the effect observed in the global sample is specific to the region.
Table 6.2. The impact of remittances on the real exchange rate

<table>
<thead>
<tr>
<th></th>
<th>(I) FE</th>
<th>(II) FE</th>
<th>(III) FE/IV1</th>
<th>(IV) FE/IV1</th>
<th>(V) FE</th>
<th>(VI) FE</th>
<th>(VII) FE/IV1</th>
<th>(VIII) FE/IV1</th>
<th>(IX) FE/IV2</th>
<th>(X) FE/IV2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances (of GDP)</td>
<td>1.464</td>
<td>0.790</td>
<td>7.391</td>
<td>-0.647</td>
<td>1.438</td>
<td>0.802</td>
<td>8.180</td>
<td>4.734</td>
<td>9.450</td>
<td>6.137</td>
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<tr>
<td>Remittances x LAC dummy</td>
<td>2.22</td>
<td>0.83</td>
<td>2.48</td>
<td>-0.08</td>
<td>2.15</td>
<td>0.84</td>
<td>2.46</td>
<td>0.61</td>
<td>2.01</td>
<td>0.68</td>
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<tr>
<td>Interest Rates (US 6-month rate)</td>
<td>0.016</td>
<td>0.017</td>
<td>0.030</td>
<td>0.037</td>
<td>0.083</td>
<td>0.016</td>
<td>0.031</td>
<td>0.034</td>
<td>0.034</td>
<td>0.037</td>
</tr>
<tr>
<td>(Change, %)</td>
<td>3.92</td>
<td>3.79</td>
<td>3.69</td>
<td>2.13</td>
<td>1.73</td>
<td>3.69</td>
<td>3.56</td>
<td>2.63</td>
<td>3.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Government consumption (of GDP)</td>
<td>0.765</td>
<td>0.739</td>
<td>1.014</td>
<td>0.674</td>
<td>0.359</td>
<td>0.809</td>
<td>1.052</td>
<td>0.901</td>
<td>0.933</td>
<td>0.800</td>
</tr>
<tr>
<td>Growth</td>
<td>-0.373</td>
<td>0.081</td>
<td>-0.031</td>
<td>-0.028</td>
<td>-0.299</td>
<td>-0.278</td>
<td>-0.45</td>
<td>-0.044</td>
<td></td>
<td></td>
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<tr>
<td>Remittances in LAC</td>
<td>2.101</td>
<td>12.186</td>
<td>2.036</td>
<td>10.205</td>
<td>11.267</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>p-val</td>
<td>0.024</td>
<td>0.024</td>
<td>0.303</td>
<td>0.053</td>
<td>0.069</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table reports the results of regressing the changes in the logged real effective exchange rate on the variables in the first column, allowing for fixed effects. IV1 indicates that remittances are treated as endogenous; IV2 indicates that remittances and growth are treated as endogenous. Instruments are in both cases the level and first differences of (logged) output per capita of the host countries of migrant workers weighted by (i) distance between sending and receiving country and (ii) share of migrants of the receiving country in the sending country. t-statistics in italics. Source: Author’s calculations.
Could these results be biased by reverse causality considerations? As discussed above, in principle one would expect that a potential causal relationship from the real exchange rate to remittances would introduce a negative bias in the previous results. However, missing variables considerations could make the sign of the bias go in any direction. Columns (3) and (4) explore whether the previous findings are robust to the use of IV estimation techniques using as instruments the variables described in Section III.2 above. These specifications indicate that, if anything, the impact of remittances on the real exchange rate would be much larger than in the models that treat remittances as an exogenous variable (i.e. the OLS estimates seem to be affected by a negative bias). In fact, while the estimates in column (1) suggested an impact parameter of about 1.5 with the IV specification the estimated parameter is almost five-fold (7.4). Similarly, for the specifications where Latin America is allowed to have a region specific impact: in this case, OLS estimates suggest an impact parameter of 2 for Latin America whereas IV estimates suggest 12.2. That is, depending on the estimation method, an increase in remittances by 1 percentage point of GDP would lead to a real exchange rate appreciation of between 2 and 12 percent. Thus doubling the remittances to GDP ratio would result in an appreciation of the real exchange rate of between 4 and 24 percent.

We have to acknowledge here that these results are far from accurate and therefore that we have to be extremely careful especially if interest centers in the order of magnitude of the point estimates of the parameter $\beta$. For example, in the case of the model in column (3) the 95 percent interval for the parameter of the remittances to GDP ratio is given by 1.5-13. More dramatically, the specification in column (4) implies that in the Latin American context, the 95 percent interval for the parameter measuring the impact of remittances on the real exchange rate is given by 1.6-22.

The basic findings described above are maintained when per capita growth is included in the real exchange rate equation. Columns (V) to (VIII) of table 6.2 are a replica of columns (I) to (IV) but now also including among the regressors per capita growth, which in these exercises is assumed to be exogenous (i.e. we do not instrument for it even when using IV estimation techniques). Columns (IX) and (X) would instrument for per capita growth as well as for remittances. On the whole, the basic message that remittances will contribute to a real exchange rate appreciation is maintained regardless of the specification considered (including or not growth, instrumenting or not for remittances and growth). However, as in the case of equations (II) and (IV) the driver behind the estimated impact of remittances on the real exchange rate seems to be the Latin American region. In fact, outside Latin America, we cannot reject the null that remittances have no impact on the real exchange rate.

As for the estimates of the rest of the variables in the control set, it is worth noting that they do not change much with respect to the specifications that did not include per capita growth. Interestingly the per capita growth rate is only significant in one case - model in column (V) - and the point estimates are negative in all but one specification. That is, judging from point estimates countries that grow faster would find that the growth effect tends to compensate for the remittances effect. On the whole, this could
indicate that the portfolio balance effect in equation (9) somewhat dominates the Balassa-Samuelson effect.

*Remittances and real exchange rate misalignment*

What's the driver behind the real exchange rate appreciation that one could expect to see following a surge in workers' remittances? Is it a reaction of the real equilibrium exchange rate to a positive shock and hence a natural adjustment to a new equilibrium? Or instead, is it a temporary deviation from the equilibrium? We now empirically assess this issue and proceed to regress David Dollar's measure of real exchange rate misalignment (see Dollar, 1992, for details regarding the calculation of this variable) on the same set of regressors discussed above. That is, we now estimate equation (3), using David Dollar's index to proxy for $\tilde{q}_n$. The results of this exercise are presented in table 6.3.\(^{102}\)

Inspection of this table indicates that the parameter of remittances tends to be significant in the Latin American countries but insignificant in the rest of the world. That is, in the Latin American context it would be difficult to defend that all the changes in the real exchange rate would be driven by an adjustment towards the new equilibrium. On the other hand the point estimates of the impact of remittances on the degree of real exchange rate misalignment are always smaller than the point estimates of the impact of remittances on the observed real exchange rate, an indication that the observed changes in the real exchange rate are a combination of adjustment towards the new equilibrium and some apparent overshooting.

For example, the basic models in columns (I) and (V) would suggest that only one-fourth of the observed change in the real exchange rate would be due to adjustments in the real equilibrium exchange rate (i.e. an estimated impact of remittances on the real exchange rate of 1.4-1.5 against an estimated impact of about 1.1 on the measure of misalignment change). This share falls to about one-tenth in the models in columns (II) and (VI) (estimated impacts of 2.0-2.1 against 1.9 for the exchange rate and misalignment measure respectively). On the other hand, the IV based estimates would suggest that between one-third and one-half of the fluctuations would be due to equilibrium adjustments.

On the whole, we take these results as an indication that the observed fluctuations in Latin America are to a large extent driven by the misalignment component. However, for the rest of the world the results in tables 6.2 and 6.3 combined would suggest that remittances have no effect on either the real exchange rate or any of its components (equilibrium or misalignment).

\(^{102}\) We would like to acknowledge here that the results in Table 6.3 are likely to be influenced by the particular measure of misalignment used (i.e. the one by Dollar, 1992). Unfortunately, data availability limits even the possibilities to measure the degree to which the results are influenced by that particular choice.
Table 6.3. The impact of remittances on real exchange rate misalignment

<table>
<thead>
<tr>
<th></th>
<th>(I)</th>
<th>(II)</th>
<th>(III)</th>
<th>(IV)</th>
<th>(V)</th>
<th>(VI)</th>
<th>(VII)</th>
<th>(VIII)</th>
<th>(IX)</th>
<th>(X)</th>
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<tr>
<td></td>
<td>FE</td>
<td>FE</td>
<td>FE/IV1</td>
<td>FE/IV1</td>
<td>FE</td>
<td>FE</td>
<td>FE/IV1</td>
<td>FE/IV1</td>
<td>FE</td>
<td>FE/IV2</td>
</tr>
<tr>
<td>Remittances (% of GDP)</td>
<td>1.106</td>
<td>0.252</td>
<td>4.815</td>
<td>2.363</td>
<td>1.140</td>
<td>0.303</td>
<td>5.660</td>
<td>6.045</td>
<td>6.610</td>
<td>7.381</td>
</tr>
<tr>
<td>Remittances x LAC dummy (% of GDP)</td>
<td>2.08</td>
<td>0.33</td>
<td>2.21</td>
<td>0.42</td>
<td>2.12</td>
<td>0.39</td>
<td>2.33</td>
<td>0.99</td>
<td>2.01</td>
<td>1.03</td>
</tr>
<tr>
<td>Interest Rates (US 6-month rate)</td>
<td>1.604</td>
<td>3.718</td>
<td>1.569</td>
<td>-0.581</td>
<td>-1.111</td>
<td>-0.12</td>
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</tr>
<tr>
<td>Interest Rates (% of GDP)</td>
<td>1.51</td>
<td>0.48</td>
<td>1.46</td>
<td>-0.07</td>
<td>-0.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terms of Trade (Change, %)</td>
<td>5.1</td>
<td>4.88</td>
<td>4.72</td>
<td>3.44</td>
<td>5.08</td>
<td>4.87</td>
<td>4.56</td>
<td>3.52</td>
<td>4.28</td>
<td>3.28</td>
</tr>
<tr>
<td>Terms of Trade (% of GDP)</td>
<td>0.230</td>
<td>0.207</td>
<td>0.420</td>
<td>0.333</td>
<td>0.224</td>
<td>0.197</td>
<td>0.422</td>
<td>0.436</td>
<td>0.335</td>
<td>0.359</td>
</tr>
<tr>
<td>Government consumption (Growth, %)</td>
<td>0.62</td>
<td>0.56</td>
<td>0.96</td>
<td>0.72</td>
<td>0.52</td>
<td>0.92</td>
<td>0.86</td>
<td>0.64</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Remittances in LAC</td>
<td>-0.020</td>
<td>-0.024</td>
<td>-0.097</td>
<td>-0.097</td>
<td>-0.317</td>
<td>-0.324</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p-val</td>
<td>-0.22</td>
<td>-0.26</td>
<td>-0.82</td>
<td>-0.81</td>
<td>-0.66</td>
<td>-0.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table reports the results of regressing the changes in the estimated real effective exchange rate misalignment on the variables in the first column, allowing for fixed effects. IV1 indicates that remittances are treated as endogenous; IV2 indicates that remittances and growth are treated as endogenous. Instruments are in both cases the level and first differences of (logged) output per capita of the host countries of migrant workers weighted by (i) distance between sending and receiving country and (ii) share of migrants of the receiving country in the sending country. t-statistics in italics. Source: Author’s calculations.
V. Conclusions and policy recommendations

In this chapter we reviewed the impact of workers remittances on the real exchange rate and concluded that although remittances do not seem to have an impact on the real exchange rate outside the Latin American region, in Latin America they are likely to lead to a real appreciation. Moreover, we have also explored whether the estimated appreciation in the regional context would be consistent with the natural appreciation that one would expect in the real equilibrium exchange rate following a positive shock, or instead whether the observed changes are more likely to be driven by changes in the misalignment component. The findings of the chapter would indicate that not all of the observed changes are consistent with the equilibrium changing according to the new fundamentals.

Against this background a natural question that arises is what Latin American policy makers can do about that real appreciation and therefore about the potential loses in international competitiveness that may come with large remittance flows to the region. We now discuss these issues.

- **Rein in fiscal policy.** Fiscal restraint is probably one of the only tools that governments have to prevent overheating, and avoid a real exchange rate appreciation in the context of a surge in international workers remittances. Beyond the theoretical reasoning in support of this tool, the estimates presented in this paper indicate that increases in the government consumption to GDP ratio would be associated with real appreciations. Yet, it must also be noted that our estimates indicate that the impact of this variable tends to be much lower than the impact of remittances. In other words, the adjustment needed to stabilize the real exchange rate may be quite large and therefore constrained by political economy considerations.

- **Avoid sterilization.** One natural question in this context is the extent to which countries should try to sterilize the remittances inflows. Sterilization can be defined as the exchange of government paper for foreign exchange so that the monetary base is insulated from the remittances flows (other sterilization-type policies would include increases in reserve requirements on all or selected parts of bank deposits). Sterilizing operations could be effective if used over the short run, but may prove infeasible if needed on a sustained basis for two main reasons. First, the magnitude of the remittances would make the quasi-fiscal costs of sterilizing these flows untenable. Large remittances inflows coupled with Latin American spreads that for the ten top receiving countries range from 141 bp in Mexico to almost 300 bp in Jamaica would in fact make this alternative extremely expensive (to the point that even assuming no pressure on the domestic interest rate, in a number of countries the cost of sterilizing the inflows in full would be measured in tenths of percentage points). Second, sterilization would possibly put pressure on the domestic interest rates something that may attract other type of inflows in search of high returns and this in turn would put more pressure on the

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103 That fiscal expansions (contractions) lead in the presence of perfect capital mobility to a real exchange rate appreciation (depreciation) is a typical result of the basic IS-LM model.
exchange rate. In this regard, if sterilization is implemented without fiscal adjustment, (i.e. tight money plus loose fiscal) it would not be unlikely to observe a further appreciation.

- **Microeconomic interventions.** Although the thrust of responses to surges on capital inflows of any type (including remittances) may be expected to be in the macro policy arena, there are a number of microeconomic interventions that governments can implement. The discussion in section II above suggested that rigidities in labor and product markets could contribute to a real appreciation in this context because of Balassa-Samuelson type of arguments. Thus efforts aimed at making domestic markets more efficient could also ease exchange rate pressures. More generally, microeconomic interventions that make the economy more competitive could somewhat offset the real exchange rate pressures.

- **Finally, accept some appreciation.** Taking together all the elements in the paper and to the extent that fiscal adjustment and microeconomic interventions may not be enough to correct the upward pressures in the real exchange rate, it is possible that Latin American policy makers will have to accept some real appreciation, especially in those countries with substantial flows. This loss of competitiveness, however, should not be viewed as a cost associated to remittances but rather as a reflection of the changing conditions brought by the significant remittances flows.
Technical Annex

The argument that a real exchange rate appreciation is a natural outcome in the presence of remittances can be illustrated with a simple model of exchange rate determination. Here, we follow Alberola et al. (1999) and assume that there are two countries in the world, each producing two goods: one tradable (subscript $T$, in what follows) and one non-tradable ($N$). The real exchange rate ($q$) is defined as the relative price of domestic to foreign goods in the consumption basket, $p$ and $p^*$, respectively, expressed in domestic currency:

$$q = p - (s + p^*)$$

where $s$ is the (log) nominal exchange rate, defined as the price of foreign currency in terms of domestic currency. Thus, an increase in $q$ represents an appreciation of the real exchange rate.

The consumer price index (CPI) for each country is a weighted-average of the tradable, non-tradable, and imported (tradable) prices, all expressed in their own currency:

$$p = (1 - \alpha_N - \alpha_T) p_T + \alpha_N p_N + \alpha_T (s + p_T^*)$$
$$p^* = (1 - \alpha_N^* - \alpha_T^*) p_T^* + \alpha_N^* p_N^* + \alpha_T^* (p_T^* - s)$$

where the $\alpha$s are the weights of the respective goods in the consumer basket. Substituting these expressions in (1), assuming that $\alpha_N = \alpha_N^*$, and rearranging terms we obtain

$$q = (1 - \alpha_T - \alpha_T^*) q_X + \alpha_N q_I$$

where:
- $q_X = p_T^* - (s + p_T^*)$ is the relative price of domestic to foreign tradables and
- $q_I = [p_N^* - p_T^* - (p_N^* - p_T^*)]$ is the price of non-tradables relative to tradables across countries.

The first component of (3) $(1 - \alpha_T - \alpha_T^*) q_X$ captures the competitiveness of the economy and determines the evolution of the foreign asset position, while the second $(\alpha_N q_I)$ plays a central role in adjusting excess demand across sectors in the economy. Each relative price adjusts to achieve equilibrium in one of the markets, and hence we will denote $q_X$ and $q_I$ as the internal and the external relative prices, respectively. The equilibrium exchange rate ($\bar{q}$, where the bar denotes equilibrium values) will require simultaneous equilibrium in both markets, and thus it will be a combination of the equilibrium internal and external relative prices.

We next characterize the external and internal equilibrium of the economy.

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104 An asterisk denotes foreign variables.
External equilibrium

Portfolio models of real exchange rate determination (Mussa 1984) focus on asset equilibrium, as defined by the attainment of agents’ desired foreign asset stock. Over time, the accumulation of net foreign assets ($F$) is given by the current account balance ($CA$), which equals the trade balance ($XN$), plus the net income that residents receive (or pay) on $F$:

$$\Delta F = CA = XN + i^*F$$  \hfill (4)

where $i^*$ is the international interest rate, which is assumed given. It will be more convenient to focus on the trajectory of the foreign asset stock relative to GDP, which can be written

$$\Delta f = ca = xN + (i^* - g) f$$  \hfill (5)

where $f$ and $xN$ denote the ratios to GDP of the respective uppercase variables, and $g$ is the rate of GDP growth. If the Marshall-Lerner condition holds an increase in the relative price of domestic tradables $q_x$ shifts consumption toward foreign tradables and worsens the trade balance. Consistent with this interpretation, it is plausible to assume that the trade balance as a percentage of GNP ($xN$) is given by:

$$xN = -\gamma q_x, \quad \gamma > 0.$$  \hfill (6)

The capital account deficit reflects the desired rate of accumulation of net foreign assets by the home country, which is assumed to depend on the divergence between the current level of assets as a percentage of GNP ($f$) and the desired equilibrium level ($\bar{f}$), itself determined by exogenous factors such as saving preferences and demographics which will not be modelled here:

$$\Delta f = ca = a(\bar{f} - f), \quad a > 0.$$  \hfill (7)

Equation (7) indicates that if the actual net foreign asset position is below its desired level, agents will accumulate assets to reach the target; conversely, if $f$ is greater than $\bar{f}$ agents will be reduce their asset holdings until they reach $\bar{f}$.

Equating (7) and (5) after using (6), and solving for $q_x$ we get:

$$q_x = a \gamma (f - \bar{f}) + (i^* - g) / \gamma f.$$  \hfill (8)

Equation (8) shows that the external real exchange rate depends on (i) the divergence between current and equilibrium asset holdings; and (ii) the current stock of net foreign assets $f$. Defining the equilibrium external real exchange rate $\bar{q}_x$ as that consistent with $f = \bar{f}$ (i.e. the exchange rate consistent with asset holdings at their equilibrium level) it follows that

$$\bar{q}_x = (i^* - g) / \gamma \bar{f},$$  \hfill (9)
From equation (9) it follows that improvements in the equilibrium net foreign asset position \( \tilde{j} \) would lead to a real exchange rate appreciation. Similarly, increases in the international interest rate \( i^* \) would also lead to a real exchange rate appreciation. On the contrary a higher growth rate would be associated with a lower equilibrium real exchange rate.

**Internal equilibrium**

The differential behaviour of sectoral relative prices between countries determines the evolution of the internal real exchange rate. Sectoral prices are in turn related to the evolution of sectoral productivity. These notions can be illustrated using a simple model with two production factors, labor (L) and capital (K). Output in each sector is determined by a Cobb-Douglas production technology:

\[
\begin{align*}
Y_N &= A_N L_N^\alpha K_N^{1-\alpha} \\
Y_T &= A_T L_T^\alpha K_T^{1-\alpha},
\end{align*}
\]  

(10)

where \( 0<\alpha<1 \) represent the intensity of labor in each sector. Labor is perfectly mobile between sectors (but not across countries), implying nominal wage equalization:

\[
W_T = W_N = W. 
\]  

(11)

Labor is paid the value of its marginal product \( \partial Y / \partial L = W / P_i \). Under Cobb-Douglas technology the ratio of marginal productivities is proportional to the ratio of average productivities:

\[
\frac{\partial Y_T / \partial L_T}{\partial Y_N / \partial L_N} = \frac{\theta_T}{\delta_N} \cdot 
\]  

(12)

From (12) it follows that the (log) sectoral price differential is equal to the labor productivity differentials plus a drift capturing the relative intensity of labor. Expressing with lower case the natural logarithms of sectoral labor productivities, (12) reduces to

\[
\bar{p}_N - \bar{p}_T = \log(\theta_T / \theta_N) + \left[ (y_T - y_N) \right] 
\]  

(13)

Neglecting constant terms and denoting \( \bar{n} = [(y_T - y_N) - (y_T^* - y_N^*)] \), the internal equilibrium exchange rate is just:

\[
\bar{q}_i = \bar{n}, 
\]  

(14)

Thus in line with the argument put forward by Balassa (1964) and Samuelson (1964), productivity differentials between the tradable and non tradable sectors relative to the foreign country will also affect the evolution of the real exchange rate. In particular, productivity gains
in the domestic tradable sector relative to the domestic non tradable, would result in a real exchange rate appreciation.

Remittances and the real exchange rate

First, remittances may affect \( q_x \). Remittance flows will raise the net foreign asset position of the country \( f \) and therefore will affect the real exchange rate. When remittances have a positive impact on \( \tilde{f} \) (i.e. when remittances affect the country’s willingness to hold foreign assets increases) the evolution \( q_x \) and therefore of \( q \) would be driven by a change in fundamentals. In this particular case, remittances would lead to an appreciation of both the real equilibrium and the observed exchange rate. When instead, remittances affect \( f \) but not \( \tilde{f} \), one would expect to observe temporary changes in \( q_x \) driven by \( (f - \tilde{f}) \) as indicated by equation 8 above. Remittances would also lead to an appreciation of the real exchange rate, but in this case would not be consistent with the fundamentals of the external equilibrium. In practice, it is possible that changes in the real exchange rate are driven by both changes in the equilibrium and adjustments towards the new equilibrium. This would be the case if \( \tilde{f} \) adjusts to the remittances but less than 1 for 1.

Second, remittances can also affect \( q_x \). If remittances lead to acceleration in the demand for services, inflation will tend to be higher in these sectors, which typically are not tradable and hence lead to a real exchange rate appreciation. Productivity differentials can also be the result of market rigidities. For example, if remittances raise the reservation wage, then excessive wage pressures in the tradable sector may lead to employment adjustments to maintain competitiveness, whereas in the non-tradable sector employers may admit these pressures because they can pass them onto prices. As a result, remittances can also lead to higher productivity growth and lower inflation in the tradable sector through their potential impact on the reservation wage.

A third possibility for remittances to affect the real exchange rate is through their impact on growth (see Chapter 3 for evidence in this regard), although in this case the impact on the exchange rate is likely to be uncertain. On the one hand, looking at the expression for the external equilibrium, an acceleration in the growth rate would lower the stock of net foreign assets as a percentage of GDP and hence this would lower the real exchange rate. Note here, that faster growth would also lower the stock of foreign liabilities as a percentage of GDP and therefore this would act as a counterbalancing effect (i.e. in countries with an outstanding liability position, a growth acceleration leads to an appreciation). In other words, a growth acceleration would reduce the weigh given to the portfolio model in the determination of the equilibrium exchange rate.

On the other hand, looking at the expression for \( q_f \) if remittances have a positive impact on growth, then one should expect a real exchange appreciation. In fact, to a large extent the Balassa-Samuelson argument is based on the observation that economic growth tends to be associated with an increase in the relative price of non-tradables. The reason is that productivity gains tend to concentrate in the tradable sector, because it is more capital intensive and
technological progress is usually embedded in new capital. With equal nominal wage increases in tradable and non-tradable sectors, due to labor mobility, equilibrium would only be attained by an upward adjustment in non-tradable prices. Thus on the whole, the impact of a growth acceleration could go in either direction or even cancel each other and have no impact.
There is an extensive economics literature, both theoretical and empirical, that focuses on whether public spending crowds out private spending and on the implications for policy design of this potential crowding. Could then it be also possible that public transfers affect remittances, which in essence are private transfers, and that increases in the former result in at least a partial decline in the latter?

I. Introduction

There is an extensive economics literature that has focused on whether public spending crowds out private spending. Martin Bailey (1971) first proposed that a unit of public consumption would likely be valued as much as $q$ ($0 < q < 1$) units of private consumption. Bailey’s basic idea is based on the notion that public and private consumption are imperfect substitutes and increases in the former will be accompanied by declines, at least partial, in the latter. For example, increases in some public spending categories, like school lunches, would likely substitute for private consumption and therefore as the government spends more on that item individual households would likely cut their consumption. True, government consumption does not need to always substitute for private consumption and in fact there are spending categories, such as spending on transportation, that probably act as a complement (in Martin Bailey’s terminology one unit of public consumption would be value $q$ units of private consumption but in this case $q < 0$) rather than as a substitute and therefore in those cases public spending will crowd in private spending.

At the aggregate level then one would expect to find public spending categories that substitute for private spending coexisting with others that complement it. What does the empirical evidence has to say in this regard? Well, earlier works on the topic (see for example Kormendi (1983) and Aschauer (1985) for the US and Ahmed (1986) for the UK) found evidence of the substitutability argument. Yet, Evans and Karras (1996) analyzed the evidence in 54 countries and found that at standard significance levels, in a large majority of cases they could not reject the null hypothesis that public and private consumption are independent. Interestingly, the results reported by Evans and Karras also indicate significant heterogeneity between

*This chapter is based on the background papers for this report “Do Conditional Cash Transfer Programs Crowd Out Private Transfers? Evidence from Randomized Trials in Rural Honduras and Nicaragua” by Pedro Olinto.
developed and developing countries: in fact, judging on the basis of the average point estimates public consumption would appear to substitute for private consumption in developing countries and to complement in developed countries. This result is also found by Lopez, Schmidt-Hebbel and Servén (2000) who estimate a private consumption function derived from first principles using a cross national panel database. In this case, however, the hypotheses that public consumption complements in richer countries and substitutes in poorer countries cannot be rejected at standard levels.

A similar line of reasoning can be put forward for a potential relationship between public and private investment. If public investment drives down the rate of return of private investment, perhaps because the public sector is involved in activities that could be carried out by the private sector or because deficit financing of the investment raises domestic interest rates, then it is likely that public investment will crowd out, at least in part, private investment. On the other hand, governments also invest in activities that raise the rate of return of private projects (e.g. infrastructure projects). In those cases it is likely that public investment will have a net positive effect on private investment.

Once again, what does the empirical evidence has to say on this issue? Easterly, Rodriguez and Schmidt-Hebbel (1994) argue that there a large number of developing countries where public investment is found to have a negative and statistically significant effect on private investment. Other studies for developing countries (Blejer and Khan, 1984 and Khan and Reinhart, 1990) also found that public investment has at best, ambiguous results, on private investment.

In this chapter we add to the literature exploring the degree of substitutability between public and private spending and focus on whether public transfers to households substitute for a particular type of private transfers: remittances. Which reasons could lead to this substitutability? One possibility is that senders target a certain minimum income level for the recipient household. Under this scenario remittances would likely behave countercyclically with respect to fluctuations in the income of the recipient households. For example, if following a downturn in the business cycle or a natural disaster the income level of the recipient household declines, then remittances would increase and compensate for the loss of income. On the other hand, when the economic situation improves and the income of the recipient household increases, one would expect to observe a decline in remittances flows.

Note that this is a policy relevant question because if remittances react negatively to public transfer programs then unless the crowding effect is fully incorporated into the analysis, the actual impact of those programs will likely be well below expectations. The rest of the chapter is organized as follows: Section II reviews the problem at hand in the context of conditional cash transfer programs In Sections III and IV we describe the RPS and PRAF-II pilot projects and their evaluation design. We also present some summary statistics for the data used in the econometric analysis. Section V presents the empirical strategy and Section VI discusses

105 See chapter 4 for evidence of the countercyclicality of remittances.
106 We have to admit here that it is possible that remittances do not react to changes in public transfers and still behave countercyclically. This would be the case if senders just react to, say, labor income.
the econometric estimation results. Finally, the chapter closes in section VII with some conclusions.

**Box 1. Conditional Cash Transfers in Colombia**

The *Familias en Acción* program is a conditional cash transfer program that has successfully increased human capital accumulation in low-density, high-poverty regions of Colombia. The program was initiated in 2001, in a context of high unemployment, slow economic growth, increasing armed conflict, and increased poverty rates. Although impact evaluations from Mexico's *Oportunidades* suggested that this program design could be effective, the Colombian doubters argued that *Familias en Acción* would create a culture of dependency and crowd-out adult labor; the cash would be diverted to adult consumption; fertility rates would increase; and the human capital impacts observed in Mexico were an anomaly that would not be replicated in Colombia. A well-designed and implemented program, coupled with carefully designed impact evaluations showed the critics to be wrong, and showed the potential of such a program in poor, rural zones. The objectives of the *Familias en Acción* program were to:

- Complement the income of extremely poor families with children age 0-18.
- Reduce the non-attendance and desertion rates of students.
- Improve health outcomes of children younger than 7 years old.
- Improve health care practices for children, including aspects such as nutrition, early stimulation and intra-family violence.

*Familias en Acción* was implemented in 631 municipalities, covering 58 percent of all low-density areas, and benefited nearly 1 million children in 340,000 families. Before the program began, the target population had monthly household expenditures below US$30 per capita, 10 percent of the children were severely malnourished, nearly 50 percent of the children age 0-6 were ill, and 9 percent of primary school children and 37 percent of secondary school children were not attending school. Eligible families were those who were indigent poor, and living in the target municipality. Families with children younger than age 7 were eligible for a bi-monthly transfer equivalent to US$17 if they complied with the growth and development control appointments for their children over the two month period. Mothers of school-aged children received equivalent to US$5.50 monthly for each child who met the primary school attendance requirements and US$10 monthly for each child who met the secondary enrolment requirements.

An impact evaluation using a randomized sample design showed that after two years, the *Familias en Acción* program had significant impacts on health and education:

- Increased consumption food, especially proteins and dairy
- Increased vaccinations by 7-12 percentage points
- Increased height of children by 0.62-0.75 cm and increased weight by 0.32-0.48 kgs
- Reduced illness by 11 percentage points
- Secondary school attendance increased by 4.6-10.1 percentage points
- Primary school attendance increased by 3 percentage points and it did not generate the adverse incentive effects that were feared. The evaluations showed:
  - Reduction in child labor by an average of 80 hours monthly
  - Increase in adult labor by 3.6-6.5 percentage points
- Participants were 2.5 percentage points less likely to migrate
- Birth rates declined by 9-13 percentage points
- Alcohol, tobacco, and other adult consumption did not increase

Given these positive results, the future of the program looks bright. The Government has just implemented the program in pilot urban areas to determine its effectiveness in high-density, high-poverty zones and, depending on the results from future impact evaluations, the Government plans to expand coverage to the entire poor population by the year 2019. On a larger scale, the Familias en Acción program shows that a successful conditional cash transfer program is not specific to the Mexico Oportunidades context or Brazil’s Bolsa Escola program, both programs that have been well evaluated. Careful evaluation has provided a new data point that supports the human capital accumulation power of conditional cash transfers, with few of the efficiency losses predicted.

II. Conditional Cash Transfers and Remittances

Conditional Cash Transfer (CCT) programs have become pervasive in Latin America and the Caribbean. They currently reach 60 million people representing approximately 60 percent of the extremely poor in Latin America (Lindert, Skoufias and Shapiro, 2005). In Mexico and Brazil alone, OPORTUNIDADES and Bolsa Familia take approximately 0.4 percent of these countries’ GDP. A natural concern by policy makers and academics alike is whether these programs are in fact crowding out private transfers, particularly remittances, which represent an important source of foreign exchange for most countries in Latin America. This would be the case if, for example, senders of remittances target the same level of income of the receiving families. If private transfers do play a role in fighting poverty, policy makers may fear that public transfers substitute for private transfers, and thus do not have the expected impacts on the welfare of the poor. It is therefore crucial to establish whether CCTs do tend to crowd out private transfers before prescribing these programs to developing nations.

The problem of public transfers crowding out private ones has been examined before by several authors. Schoeni (1996) finds that private assistance in the form of both cash and time-help were crowded out by AFDC benefits in the United States. Also, Schoeni (2002) concludes that unemployment insurance crowds out interfamilial transfers. However, the estimators employed in both studies utilize state program design characteristics as instrumental variables for participation in social programs (unemployment insurance and AFDC), and the identification assumption that state program characteristics are exogenous may not be believable. Beneficiaries of social programs are known to move to states that offer better benefits. Thus, beneficiaries who have less access to interfamilial transfers may in fact choose to live in states in which the rules for enrolment in social insurance programs are favorable to them.

Likewise, Cutler and Gruber (1996) find that the extension of Medicaid to pregnant women and children in the US crowds out private insurance coverage. But like the Schoeni studies above, identification of the effects of public provided insurances relies on the assumption that state legislation is exogenous. But if states expand coverage of public insurance schemes to respond to a reduction in private coverage, the estimators utilized will be biased. Cox, Eser, and
Jimenez (1998) also find that social security benefits 'crowd out' the incidence of private transfers in Peru. However, their estimator may also be biased downwards because those who are more likely to receive social security may also be less likely to receive private transfers because of unobserved household characteristics, as, for instance, access to savings and access to credit markets. That is, in developing countries like Peru, it is well known that formal workers who have access to social security also tend to have more access to credit and savings mechanisms, and are better able to mitigate shocks and less likely to need private transfers.

More recently, evidence from studies utilizing experimental data provides mixed results. Attanasio and Rios-Rull (2000) find some weak evidence supporting the crowding out hypothesis for the Mexican CCT program PROGRESA which was implemented in randomly selected communities. However, that study only used one ex-post sample survey, ignoring possible baseline imbalances, which further weaken their results. In a more thorough analysis which employs two rounds of the PROGRESA evaluation data, Teruel and Davis (2000) more convincingly reject the crowding out impact of PROGRESA on private transfers.

This chapter addresses the crowding out question by estimating the impact of CCT programs similar to PROGRESA on private transfers in Honduras and Nicaragua. These countries were chosen because, like Mexico, they implemented experimental CCT pilots to robustly estimate the impact of these programs on a series of outcome variables including remittances. However, to the best of our knowledge, the data on remittances have not yet been analyzed.

In Honduras, the inhabitants of the 70 poorest municipalities in the country were selected to participate in the PRAF experiment. Of these 70 municipalities, 40 were randomly assigned to participate in the program while 30 were randomly assigned to a control group. For the Red de Proteccion Social (RPS) in Nicaragua, 42 rural comarcas were included in the experiment. Half of them were randomly assigned to the program, while the other half was selected to the control group.

In both pilots, baseline surveys were conducted before the start of the respective programs. In Honduras, approximately 5,600 households were surveyed in 2000 and then again in 2002, respectively before and after the PRAF-II pilot was launched. In Nicaragua, approximately 1,500 households were surveyed in 2000, just before the program initiated, and then again in 2001 and 2002. To estimate the impact of CCTs on remittances we apply the same double-difference methods utilized by several authors estimating the impacts CCTs on different health, education and welfare indicators. That is, we compare the estimated mean time-changes in the volume (and incidence) of remittances between the control and the treatment groups. This allows us to correct for possible initial sample imbalances that may exist due to finite samples.

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107 See Morris et al, 2004 and Glewwe and Olineto 2005 for detailed descriptions of the experimental design of PRAF.
III. The Red de Proteccion Social (RPS) and the PRAF-II programs

The RPS in Nicaragua

The RPS is a CCT program comprised of two phases over five years, starting in 2000. The pilot phase lasted three years. For this pilot, the Government of Nicaragua selected the departments of Madriz and Matagalpa from the northern part of the Central Region, on the basis of poverty as well as on their capacity to implement the program. Approximately 80 percent of the rural population in Madriz and Matagalpa were poor, and half of those were extremely poor (IFPRI 2002). From these two departments, 42 communities (comarcas) were selected to participate in the pilot, 21 of them were to receive the intervention, or treatment, and the other 21 were to serve as control communities.\footnote{For more details on the criteria for selecting these 42 municipalities, see Maluccio and Flores, 2004.}

The RPS has two core components: (i) A food security, health, and nutrition component, that gives each eligible household a conditional cash transfer known as the \textit{bono alimentario}, or food security transfer, every other month, contingent on attendance at educational workshops held every other month and on bringing their children under age 5 for scheduled preventive (or well child) health-care appointments. (ii) An education component given to each eligible household as a cash transfer known as the \textit{bono escolar}, or school attendance transfer, every other month, contingent on enrollment and regular school attendance of children ages 7 to 13 that have not completed fourth grade of primary school. Additionally, for each eligible child, the household receives an annual cash transfer intended for school supplies (including uniforms and shoes) known as the \textit{mochila escolar} or school supplies transfer, which is contingent on enrollment. The amounts for each transfer were initially determined in U.S. dollars and then converted into Nicaraguan córdobas (C$) in September 2000. The food security transfer was S$224 a year, and the school attendance transfer S$112. Both were delivered to beneficiaries every two months.

The PRAF-II program in Honduras

The Programa de Asignacion Familiar (PRAF) is one of the largest social welfare programs in Honduras. PRAF was initiated in 1990 as a social safety net to compensate the poor for lost purchasing power brought about by macroeconomic adjustments. It was restructured in 1998, and now includes a reformulated CCT project known as PRAF - Phase II (henceforth referred to as PRAF II). The objective of this project is to encourage poor households to invest in their family's education and health by providing monetary incentives to increase primary school enrollment and the use of preventive health care services.

PRAF-II was launched in October of 2000. It has the following specific objectives: (i) boost the demand for education services; (ii) encourage the “education community” to take part in children's learning development; (iii) instruct mothers of young children in feeding and hygiene practices; (iv) ensure that sufficient money is available for a proper diet; (v) promote demand for, and access to, health services for pregnant women, nursing mothers and children under age 3; and (vi) ensure timely and suitable health care for PRAF beneficiaries.
PRAF-II was piloted in 40 municipalities selected randomly from a set of 70 similarly poor municipalities in western Honduras. The municipalities were selected in October, 1999, and the interventions began in late 2000. Among the 30 control municipalities, 10 were supposed to receive supply side “block grants” to be invested in health centers and schools. But by the final round of data collection of the evaluation study, these block grants had not been delivered yet.

Like the RPS in Nicaragua, PRAF-II has two CCT components: one for health and nutrition, and another one for education. The CCT for health and nutrition consists of monetary transfers to pregnant women and to mothers of children ageing less than three years. The monetary voucher is provided only for women who have visited health clinics every month as required by the program. Each family may receive up to two vouchers per month (one woman and one child, or two children), each worth approximately US$4.

The CCT component for education consists of monetary payments to families for each child aging 6-12 who is enrolled in the first four years of primary school and attends regularly. A maximum of up to three children per family are eligible (this is in addition to any monetary payments received from the transfer for health and nutrition). The family receives approximately US$5 per month for each eligible child. To be eligible for a payment, the child needs to be enrolled by the end of March (the school year in Honduras begins in March and ends in December) and to maintain an attendance rate of at least 85 percent. In fact, although the enrollment requirement was strictly enforced there were serious problems monitoring attendance, so that for most families the 85 percent attendance requirement was not enforced.

IV. The Data

The data collected for the evaluations of both programs are from annual household panel surveys implemented in both treatment and control areas before and after both programs started in 2000. The household questionnaires applied in both countries collected data on: a) housing; education and employment of all household members; b) education (very detailed) of all children age 6-16; c) the health of all women who were pregnant in the past 12 months; d) the health of all children below three years of age (and height, weight and hemoglobin information for all children under five years); e) consumption expenditures on food and non-food items; f) access to credit; g) remittances received from household members who have moved away; h) receipt of assistance from various government and private agencies; i) ownership of livestock and durable goods; j) time spent by the “woman of the house” and by children age 6-12 doing various activities; and k) households’ evaluation of the quality of local health centers and primary schools.

For the RPS in Nicaragua, the questionnaire was a comprehensive household questionnaire based on the 1998 Nicaraguan LSMS instrument. The survey sample is a stratified random-sample at the comarca level for all 42 comarcas described above. Forty-two households were randomly selected in each comarca using a census carried out by RPS three months prior to the survey as the sample frame, yielding an initial target sample of 1,764 households. The first wave of fieldwork was carried out in late August and early September 2000. The education CCT
started to be distributed in the end of September, 2000 and the health-care CCT component was not initiated until June 2001. In October 2001, when beneficiaries had been receiving transfers for 13 months, the second round of data collection was conducted. The 2002 survey was also carried out in October. Overall, 90 percent (1,581) of the intended sample was interviewed in the first round in 2000. For the follow-up surveys in October 2001 and October 2002, the target sample was limited to these 1,581 first-round interviews. In 2001, just over 91 percent (1,453) of these were re-interviewed. In 2002, 88 percent (1,397) of the original 1,581 were found and interviewed. Because the same target sample was used in 2002 as in 2001, regardless of whether the household was interviewed in 2001, some households that were not interviewed in 2001 were successfully interviewed in 2002.

In Honduras, after the 70 municipalities were chosen, baseline data were collected from all 70 before the CCTs were given out in the 40 municipalities selected to receive the program. The baseline data were collected in 2000, from mid-August to mid-December. One follow-up survey was conducted approximately two years later, from mid-May to mid-August of 2002. From each of the 70 municipalities, eight communities ("clusters") were randomly selected, and from each cluster 10 dwellings were randomly selected (see IFPRI, 2000, for details of the sampling methodology). Assuming one household per dwelling, this implies a total sample of 5600 households. However, some of the dwellings had more than one household, so the total number of households selected was 5748. In most cases, each group of 10 dwellings is found within a different village (aldea) of the municipality, but in some cases two or more groups of 10 are from the same village. Of these 5748 households, 5546 were interviewed in 2000. The remaining households were either unavailable or refused to talk to interviewers. Of the 5546 households interviewed, 30 refused to complete the consumption module of the questionnaire, and 40 completed it with unusable data. Of the 5476 remaining households, 1,050 were not eligible for the PRAF-II pilot because they did not have pregnant women, or children ageing between 0 and 3, or 6 and 13. Therefore, 4,426 baseline valid interviews with eligible households were conducted in 2000. In the 2002 follow-up survey, about 93 percent of the 4,426 households in the 2000 survey were re-interviewed. This high re-interview rate reflects attempts made to follow households that moved. (More specifically, all children aged 0-13 years and all women aged 15-49 who still lived in one of the seven departments from which the 70 municipalities were drawn were targeted to be followed in 2002). In addition, household members who left the households they belonged to in 2000, either to form a new household or to join an existing household were followed if they were part of PRAF II’s target population: pregnant women, lactating mothers, and children aging 0-16 years.

As seen in Table 6.1, the households are about evenly divided between intervention and control groups, indicating that at least the level of attrition was not significantly different between them (see Maluccio and Flores, 2004, for a more detailed analysis of the attrition on this sample, which concludes that attrition is not correlated to treatment or control status). Table 6.1 also shows that very few households in this sample received remittances during the years covered by the survey (between 4 percent in 2000 and 6 percent in 2002). Differences between the treatment and control samples suggest, at first glance, that there is no impact of RPS on the incidence of remittance. If anything, remittance prevalence appears to grow more for treatment than for control households, suggesting, counter-intuitively, a positive impact of CCTs on remittances. The average amount received per year is also very low, ranging from US$16 per
household per year for the extreme poor and US$107 for non poor households. As a share of total household expenditures, these transfers range from 2 percent to 9 percent of total annual expenditures for receiving households.

Table 7.2 presents some descriptive statistics for the sample in Honduras. As it can be seen, approximately 20 percent of households in the sample received remittances in 2000 and 2002. This figure is slightly higher for the non-poor and the moderate poor (21 percent in 2000 and 24 percent in 2002) than for the extremely poor (19 percent in 2000 and 18 percent in 2002). There seems to be no substantial differences in the incidence of remittances between the treatment and control households, except perhaps for the extreme poor. But since this difference was present before the program started (baseline difference), the difference in the 2002 data seems to be a consequence of the original difference. The average remittances amount received by a receiving household in 2000 was about US$191 dollars per year. In 2002, this same average had increased to approximately US$298 per receiving household per year. For these receiving households, this amount represented approximately 9 percent annual household expenditures in 2000, and 14 percent in 2002. Note from Table 7.2 also that, that not all eligible (treatment) households participated in the program. About 86 percent of the eligible households living in treatment municipalities take up the program. In the control municipalities, it appears that the program leaks to approximately 4 percent of the “would be” eligible households.

V. The empirical strategy

In the technical annex we describe the empirical strategy in detail. In sum, we estimate the coefficients in the following equations via OLS:

\[ Y_{t0} = \alpha_{t0} + \beta_{t0}Z_i + \epsilon_{t0}, \]
\[ Y_{t1} = \alpha_{t1} + \beta_{t1}Z_i + \epsilon_{t1}, \]
\[ Y_{t2} = \alpha_{t2} + \beta_{t2}Z_i + \epsilon_{t2}, \]

where \( Y_{it} \) is represents either the incidence or amount of private transfers received by household \( i \) in year \( t=2000, 2001 \) or \( 2002 \), and \( Z_i \) is a dummy variable indicating whether household \( i \) lives in a treatment (\( Z_i=1 \)) or control (\( Z_i=0 \)) community. The parameters of interest are \( \beta \), where \( t=2000, 2001 \) or \( 2002 \). Note that \( \beta_{t0} \) captures any baseline imbalances in the incidence and intensity of the flow of remittances between treatment and control communities. In theory \( \beta_{t0} \) should be zero, but because we do have a small finite sample, sampling errors may result in imbalances such that \( \beta_{t0} \) is not zero.

The double difference estimators of impact of the CCT treatments on private transfers is therefore given by \( \beta_{t1} - \beta_{t0} \) and \( \beta_{t2} - \beta_{t0} \). Then we perform the following tests:

<table>
<thead>
<tr>
<th>Tests:</th>
<th>( H_0: )</th>
<th>( H_1: )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>( \beta_{t1} - \beta_{t0} = 0 )</td>
<td>( \beta_{t1} - \beta_{t0} \neq 0 )</td>
</tr>
<tr>
<td>Test 2</td>
<td>( \beta_{t2} - \beta_{t0} = 0 )</td>
<td>( \beta_{t2} - \beta_{t0} \neq 0 )</td>
</tr>
</tbody>
</table>

200
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000 C</td>
<td>T</td>
<td>Total</td>
<td>2001 C</td>
<td>T</td>
</tr>
<tr>
<td>Number of Households</td>
<td>771</td>
<td>810</td>
<td>1581</td>
<td>687</td>
<td>766</td>
</tr>
<tr>
<td>% of households that participated in the program</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>0%</td>
<td>95%</td>
</tr>
<tr>
<td>Average annual household expenditure (US$)</td>
<td>1512</td>
<td>1527</td>
<td>1520</td>
<td>1315</td>
<td>1637</td>
</tr>
<tr>
<td>% of households that receive remittances</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Average remittances received in US$ (receiving households only)</td>
<td>46</td>
<td>61</td>
<td>52</td>
<td>57</td>
<td>45</td>
</tr>
<tr>
<td>All households Remittances as % of household expenditures (receiving households only)</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>5%</td>
<td>4%</td>
</tr>
</tbody>
</table>

| Number of Households             | 338    | 299 | 637   | 300    | 283 | 583   | 291    | 260 | 551   |
| % of households that participated in the program | NA   | NA | NA    | 0%     | 98% | 47%   | 0%     | 98% | 46%   |
| Average annual household expenditure (US$) | 952    | 943 | 948   | 1121   | 1527 | 1318  | 1142   | 1408 | 1267  |
| % of households that receive remittances | 4%    | 2%  | 3%    | 7%     | 2%  | 5%    | 4%     | 3%  | 4%    |
| Average remittances received in US$ (receiving households only) | 20    | 16  | 19    | 32    | 34  | 33    | 24    | 41  | 32    |
| Extreme Poor Remittances as % of household expenditures (receiving households only) | 4%    | 2%  | 4%    | 3%     | 3%  | 3%    | 2%     | 5%  | 3%    |

| Number of Households             | 264    | 311 | 575   | 238    | 292 | 530   | 236    | 278 | 514   |
| % of households that participated in the program | NA   | NA | NA    | 0%     | 96% | 53%   | 0%     | 95% | 51%   |
| Average annual household expenditure (US$) | 1615   | 1672 | 1646  | 1343   | 1734 | 1558  | 1409   | 1706 | 1569  |
| % of households that receive remittances | 5%    | 5%  | 5%    | 6%     | 5%  | 5%    | 8%     | 9%  | 9%    |
| Moderate Remittances as % of household expenditures (receiving households only) | 55    | 73  | 65    | 55    | 33  | 44    | 34    | 65  | 51    |

| Number of Households             | 169    | 200 | 369   | 149    | 191 | 340   | 148    | 184 | 332   |
| % of households that participated in the program | NA   | NA | NA    | 0%     | 89% | 50%   | 0%     | 89% | 49%   |
| Average annual household expenditure (US$) | 2472   | 2175 | 2311  | 1662   | 1653 | 1657  | 1731   | 1666 | 1695  |
| % of households that receive remittances | 6%    | 5%  | 5%    | 5%     | 4%  | 4%    | 5%     | 8%  | 7%    |
| Average remittances received in US$ (receiving households only) | 71    | 67  | 69    | 133    | 80  | 107   | 35     | 20  | 25    |
| Non-Poor Remittances as % of household expenditures (receiving households only) | 2%    | 3%  | 2%    | 6%     | 9%  | 7%    | 3%     | 2%  | 2%    |

Note: The column with the heading C reports statistics for the control group, whereas that with the heading T reports statistics for the treatment group. Source: Author's calculations.
Table 7.2. Summary statistics of eligible households surveyed in Honduras in 2000 and 2002

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Treatment</td>
</tr>
<tr>
<td>Number of Households</td>
<td>1872</td>
<td>2554</td>
</tr>
<tr>
<td>% of households that participated in the program</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Average annual household expenditure (US$)</td>
<td>2296</td>
<td>2663</td>
</tr>
<tr>
<td>% of households that receive remittances</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>All households Average remittances received in US$ (receiving households only)</td>
<td>176</td>
<td>204</td>
</tr>
<tr>
<td>Remittances as % of household expenditures (receiving households only)</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>Number of Households</td>
<td>1386</td>
<td>1734</td>
</tr>
<tr>
<td>% of households that participated in the program</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Average annual household expenditure (US$)</td>
<td>1623</td>
<td>1715</td>
</tr>
<tr>
<td>% of households that receive remittances</td>
<td>20%</td>
<td>17%</td>
</tr>
<tr>
<td>Extreme Average remittances received in US$ (receiving households only)</td>
<td>139</td>
<td>111</td>
</tr>
<tr>
<td>Remittances as % of household expenditures (receiving households only)</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>Number of Households</td>
<td>151</td>
<td>233</td>
</tr>
<tr>
<td>% of households that participated in the program</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Average annual household expenditure (US$)</td>
<td>2720</td>
<td>2855</td>
</tr>
<tr>
<td>% of households that receive remittances</td>
<td>23%</td>
<td>20%</td>
</tr>
<tr>
<td>Poor Average remittances received in US$ (receiving households only)</td>
<td>154</td>
<td>221</td>
</tr>
<tr>
<td>Remittances as % of household expenditures</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Number of Households</td>
<td>335</td>
<td>587</td>
</tr>
<tr>
<td>% of households that participated in the program</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Average annual household expenditure (US$)</td>
<td>4891</td>
<td>5390</td>
</tr>
<tr>
<td>% of households that receive remittances</td>
<td>19%</td>
<td>22%</td>
</tr>
<tr>
<td>Non-Poor Average remittances received in US$ (receiving households only)</td>
<td>348</td>
<td>422</td>
</tr>
<tr>
<td>Remittances as % of household expenditures (receiving households only)</td>
<td>10%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: Author's calculations.
We present and discuss the results of these regressions and tests below. Note, however that the β's above, and their differences as well, give us the impacts of being offered access to the CCT programs. Since it is possible that not all eligible households participate in the programs offered, this impact may differ from the average effect of actually participating in the program on receiving remittances. As shown in Tables 7.1 and 7.2 above, however, very few eligible households did not participate in the pilots. Therefore, we expect that the estimated impacts for being offered the programs will be very similar to the impacts of actually participating in the programs.

VI. Estimation results

Tables 7.3 to 7.6 contain the results for the linear probability models (LPM) and OLS estimates for the impact of CCTs on, respectively, the incidence and volume of private transfers. Tables 7.3 and 7.5 present the LPM results for Nicaragua and Honduras respectively. While the cross-sectional results for 2001 suggest some crowding out of private transfers by RPS CCTs, the double-difference results for Models 1, 2 and 3 indicate that there seems to be no impact whatsoever of RPS or PRAF-I1 on the incidence of private transfers, for either 2001 or 2002.

Table 7.4 and 7.6, which present OLS estimates of the impact of CCTs on the volume of remittances for Nicaragua and Honduras respectively, leads us to a similar conclusion. Again, while the cross-sectional results for 2001 suggest some crowding out of private transfers by RPS CCTs (in Models 2 and 3), the double-difference results for Models 1, 2 and 3 suggest no impact of either RPS or PRAF-I1 at all, for either 2001 or for 2002.

In addition to testing for time differences between each individual coefficient, we also perform joint tests for all coefficients multiplying a variable containing the treatment dummy (treatment dummy by itself and interacted with log annual per-capita expenditure). For any of the programs and for any of the models, we are unable to reject the null hypothesis that all coefficients multiplying a term which includes the treatment dummy is equal to zero. This suggests that participation in the CCTs in Nicaragua and Honduras has had no effect whatsoever on the incidence or volume of private transfers, for any level of initial socio economic status.

Finally, note that there seems to be a positive relationship between socio economic status, as measured by the log of per capita expenditures, and the incidence and volume of private transfers. This is a common finding in the literature, which suggests that remittances recipients are less likely to find themselves in extreme poverty.
Table 7.3. Linear Probability Model Estimates of the Impact of RPS on the Incidence of Remittances

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Treatment Dummy</td>
<td>-0.0121</td>
<td>-0.0259**</td>
<td>0.0101</td>
<td>-0.0138</td>
<td>0.0222</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.013)</td>
<td>[0.361]</td>
<td>[0.174]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0467***</td>
<td>0.0611***</td>
<td>0.0578***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1581</td>
<td>1453</td>
<td>1397</td>
<td></td>
<td></td>
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</tr>
</thead>
<tbody>
<tr>
<td>Treatment Dummy</td>
<td>-0.0136</td>
<td>-0.0263**</td>
<td>0.0081</td>
<td>-0.0127</td>
<td>0.0217</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.013)</td>
<td>[0.396]</td>
<td>[0.182]</td>
</tr>
<tr>
<td>Log of Baseline Per-capita expenditures (lnpcx)</td>
<td>0.0133***</td>
<td>0.0036</td>
<td>0.0166**</td>
<td>-0.0097</td>
<td>0.0033</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.006)</td>
<td>(0.007)</td>
<td>[0.210]</td>
<td>[0.675]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0475***</td>
<td>0.0614***</td>
<td>0.0587***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1581</td>
<td>1453</td>
<td>1397</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Dummy</td>
<td>-0.0136</td>
<td>-0.0262**</td>
<td>0.008</td>
<td>-0.0126</td>
<td>0.0216</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.013)</td>
<td>[0.402]</td>
<td>[0.183]</td>
</tr>
<tr>
<td>Log of Baseline Per-capita expenditures (lnpcx)</td>
<td>0.011</td>
<td>-0.0046</td>
<td>0.0126</td>
<td>-0.0156</td>
<td>0.0016</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td>[0.171]</td>
<td>[0.875]</td>
</tr>
<tr>
<td>Treatment Dummy X lnpcx</td>
<td>0.0046</td>
<td>0.0157</td>
<td>0.0077</td>
<td>0.0111</td>
<td>0.0031</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.013)</td>
<td>[0.471]</td>
<td>[0.837]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0473***</td>
<td>0.0608***</td>
<td>0.0585***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1581</td>
<td>1453</td>
<td>1397</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses. P-values for the 2DIF tests in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
Source: Author's calculations.
### Table 7.4. OLS Estimates of the Impact of RPS on the Incidence of Remittances

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Dummy</td>
<td>-0.44</td>
<td>-25.14</td>
<td>18.19</td>
<td>-24.69</td>
<td>18.64</td>
<td></td>
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</tr>
</tbody>
</table>

Standard errors in parentheses. P-values for the 2DIF tests in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
Source: Author's calculations.
Table 7.5. Linear Probability Model Estimates of the Impact of PRAF-II on the Incidence of Remittances

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<td>(0.010)</td>
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</tr>
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Model 2

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<td>(0.006)</td>
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Model 3

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<td>Treament Dummy</td>
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<tr>
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<td>(0.010)</td>
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<tr>
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Standard errors in parentheses. P-values for the 2DIF tests in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
Source: Author's calculations.
Table 7.6. OLS Estimates of the Impact of PRAF-II on the Incidence of Remittances

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<td>(97.3)</td>
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<td>(76.8)</td>
<td>(100.9)</td>
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</table>

Standard errors in parentheses. P-values for the 2DIF tests in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
Source: Author's calculations.

VII. Conclusions

In this chapter we explored the degree of substitutability between public and private transfers. If senders target a certain minimum income level for the recipient household,
remittances would likely behave countercyclically with respect to fluctuations in the income of the recipient households. This is of policy relevance because if private transfers respond negatively to public transfer programs like CCTs, then unless the crowding out effect is fully incorporated into the ex-ante analysis of CCT programs, the actual impact of those programs will likely be well below expectations.

With few exceptions, previous empirical evidence suggesting that public transfer programs have important crowding out effects may have been biased since they did not utilize experimental data. In this chapter we have used experimental data from the evaluations of two CCTs in Central America, the Red de Protecion Social in Nicaragua, and PRAF-II in Honduras, to assess the link between the access to Conditional Cash Transfers and the incidence and volume of private transfers. That is, we try to answer the question: Do CCTs crowd out private transfers?

In line with the findings of Teruel and Davis (2000) for the PROGRESA CCT program in Mexico, we find no evidence that CCTs crowd out private inter-household transfers in either Nicaragua or Honduras. This result helps dispel concerns that CCTs could be displacing private networks and informal insurance schemes. They contradict some previous findings in the literature, perhaps because CCTs are usually well targeted to the most vulnerable who are less likely to be receiving private transfers in the first place. This is confirmed by the low incidence of transfers in Nicaragua, but not in Honduras. In the case of Honduras, nevertheless, it is likely that the amounts given out by PRAF-II are too low to actually have any crowding out effects on private transfers. As discussed in Glewwe and Olinto, PRAF-II transfers amount in average to only 4 percent of household annual expenditures, while other CCTs like Progresa, Bolsa Familia, and RPS range from 15 to 20 percent of household expenditures (Lindert, Skoufias and Shapiro, 2006). Thus, as long as transferred amounts continue to be small, and programs are be well targeted to those who are less likely to receive remittances, CCTs are unlikely to crowd out private remittances and other forms of private insurance.
Technical Annex

Let $Z_i$ be an indicator variable that equals 1 if the household $i$ lives in a community in which a CCT program is offered, and zero otherwise. Let $Y_{1it}$ represent the observed outcome of interest for households for which $Z_i = 1$, that is, for households living in treatment communities. For instance, $Y_{1it}$ could represent the amount of remittances received for a given household $i$ during year $t$. It could also be a binary variable taking the value one if the household $i$ received remittances during year $t$, and zero otherwise. Finally, let $Y_{0it}$ represent the counterfactual outcome of interest for households for which $Z_i = 1$. That is, $Y_{0it}$ gives the latent value that the outcome variable would take if a household $i$, for which $Z=1$, was observed in a hypothetical situation in which it was assigned to the control group.

Thus, for household $i$, the impact during period $t$ of living in a community in which a CCT is offered to all eligible households is simply $\Delta_i = Y_{1it} - Y_{0it}$. However, we cannot compute $\Delta_i$ for each treatment household because we cannot observe the latent variable $Y_{0it}$. Nevertheless, it is common in the literature of impact evaluation to estimate the Average Treatment Effect on the treated, which is defined by:

$$ATE_{it} = E(Y_{1it} - Y_{0it}|Z=1)$$

The data available for analysis is generated by the following process: If $Z_i = 0$, we observe $Y_{0it} = m_{0i} + \nu_{0it}$, where $m_{0i}$ is the population mean for the outcome variable under the no program regime, and $\nu_{0it}$ is a disturbance around this population mean, such that $E(\nu_{0it})=0$. If $Z_i = 1$, we observe $Y_{1it} = m_{1i} + \nu_{1it}$, where $m_{1i}$ is the population mean for the outcome variable under the regime in which households have access to the program, and likewise, $\nu_{1it}$ is a disturbance around this mean such that $E(\nu_{1it})=0$.

Therefore,

$$ATE_{it} = E(Y_{1it} - Y_{0it}|Z=1)=m_{1i} - m_{0i} + E(\nu_{1i}|Z=1) - E(\nu_{0i}|Z=1).$$

In the evaluations of both CCT pilots in Honduras and Nicaragua, the sampling processes give us the vector $(Y, Z)$, where $Y$ is defined as

$$Y_i = Y_{0i} + Z(Y_{1i} - Y_{0i}) = m_{0i} + Z(m_{1i} - m_{0i}) + \nu_{0i} + Z(\nu_{1i} - \nu_{0i})$$  \hfill (1)

or

$$Y_i = \alpha_i + \beta_i Z + \epsilon_i$$  \hfill (1')

where:

$\alpha_i = m_{0i}$,
\[ \beta_t = (m_{1t} - m_{0t}), \]
\[ \varepsilon_t = \nu_{0t} + (\nu_{1t} - \nu_{0t})Z. \]

The estimation problem is therefore to obtain a consistent estimator of \( \text{ATE}_{1t} = \beta_t + E(v_{1t}|Z=1) - E(v_{0t}|Z=1) \), given the data generating and sampling processes described above. But note that because of the randomization carried in both CCT pilots, it is safe to assume ignorability of treatment. That is, we can assume that \( Z \) is stochastically independent of \((\nu_0, \nu_1)\), in which case \( E(v_{1t}|Z) = E(v_{1t}) = 0 \), \( E(v_{0t}|Z) = E(v_{0t}) = 0 \), and \( \text{ATE}_{1t} = \beta_t \). Therefore, since \( E(Y_t|Z) = \alpha_t + \beta_tZ \), the OLS regression of \( Y_t \) on \( Z \) gives us a consistent and unbiased estimator of \( \text{ATE}_{1t} = \beta_t \).

The OLS regression above can be run for all years for which we have data, namely, \( t=2000, 20001 \) and \( 2002 \) for the RPS in Nicaragua, and \( t=2000 \) and \( 2002 \) for PRAF-II in Honduras. The OLS regressions for \( t=2000, 2001 \) and \( 2002 \) will give us consistent estimators of \( \beta_{00}, \beta_{01}, \beta_{02} \), respectively.

Note that \( \beta_{00} \) gives the average effect of living in a treatment community before both programs had even started. Thus, unless households promptly reacted to the random assignments of their communities to treatment and control groups, which is unlikely in the case of remittances, we can assume that, for the population as a whole, \( \beta_{00} = 0 \). However, because of sampling errors, we might find that the OLS estimator of \( \beta_{00}, \hat{\beta}_{00} \), is in fact not zero. In this case, the double difference estimator of \( \text{ATE}_{1t} \) for \( t=2001 \) and \( 2002 \), respectively given by \( \hat{\beta}_{01} - \hat{\beta}_{00} \) and \( \hat{\beta}_{02} - \hat{\beta}_{00} \), are more efficient than the pure ex-post cross-sectional estimators \( \hat{\beta}_{01} \) and \( \hat{\beta}_{02} \).

In sum, we proceed by estimating the following system of equations via Seemingly Unrelated Regression methods:

\[ Y_{t00} = \alpha_{00} + \beta_{00}Z_t + \varepsilon_{00}, \]
\[ Y_{t01} = \alpha_{01} + \beta_{01}Z_t + \varepsilon_{01}, \]
\[ Y_{t02} = \alpha_{02} + \beta_{02}Z_t + \varepsilon_{02}, \]

and then perform the following tests, jointly and separately:

<table>
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<th>Tests:</th>
<th>( H_0: )</th>
<th>( H_a: )</th>
</tr>
</thead>
<tbody>
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<td>Test 1</td>
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<td>( \beta_{01} - \beta_{00} \neq 0 )</td>
</tr>
<tr>
<td>Test 2</td>
<td>( \beta_{02} - \beta_{00} = 0 )</td>
<td>( \beta_{02} - \beta_{00} \neq 0 )</td>
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</table>

We present and discuss the results of these regressions and tests below. Note, however that the \( \beta_t \)'s above, and their differences as well, gives the \( \text{ATE}_{1t} \) of being offered access to the CCT programs. Since it is possible that not all eligible households participate in the programs offered, this \( \text{ATE}_{1t} \) may differ from the average effect of actually participating in the program on
receiving remittances. As shown in Tables 7.1 and 7.2 above, however, very few eligible households did not participate in the pilots. Therefore, we expect that the estimated $ATE_1$ for being offered the programs will be very similar to the $ATE_1$ of actually participating in the programs.
Chapter 8

Remittances, growth and the role of complementary policies

The previous chapters have argued that despite some potential policy challenges, remittances have a number of beneficial effects for the welfare of the receiving countries. However, beyond facilitating remittances flows by for example reducing the cost of transfers or improving the payments system, what can policy makers do to enhance the positive impact of remittances? Is it possible that remittances flows, when complemented with appropriate policies have a larger impact on growth and poverty reduction? If so, which policy areas deserve particular attention?

I. Introduction

One typical concern that development practitioners have with studies on workers' remittances is that even when they present good descriptions of the nature (i.e. magnitude, cyclicality, profile of receivers, etc.) and impact (i.e. poverty, growth, financial development, etc) of these flows, policy recommendations are often restricted to suggesting (either implicitly or explicitly) that countries should try to improve their payments systems and reduce the cost of sending international remittances (see Chapter 9). That is, in many cases the main recommendation of these studies is that policy makers should aim only at facilitating and increasing those flows.\footnote{This chapter is based on the background papers for this report “Remittances, growth, and policy complementarities” by Cesar Calderon, Pablo Fajnzylber, and Humberto Lopez.}

In fact, we have to admit that the concern mentioned in the previous paragraph is to a large extent understandable if one considers that remittances are transfers between private parties and that it is difficult to imagine government policies which could enhance their positive impact. For example, if recipients and senders jointly decide that given the country’s existing economic environment and their specific personal situation, remittances should be directed towards consumption rather than towards saving or investment (a typical concern of policy makers in

\footnote{Defenders of studies on remittances tend to argue that gaining knowledge about some related stylized facts can be extremely useful. For example, having a good idea of the impact of remittances on the real exchange rate can be of great value for those in charge of managing the exchange rate and/or the monetary policy of a country facing a surge in remittances inflows (Chapter 6). Similarly, being able to understand the links between migration patterns and remittances flows (Chapter 2) can also be useful in the preparation of medium term macroeconomic frameworks.}
recipient countries), then it is difficult to imagine which type of direct policy interventions may induce those individuals to do otherwise, other than forcing recipients to save, as a number of countries have done at some point—e.g., Lesotho or Mozambique in Africa, and Mexico in Latin America (see Box 1). And indeed this is probably the type of policy recommendation to avoid because, as argued by Maimbo and Ratha (2005), forcing remittance recipients to save more and consume less tends to reduce consumer welfare.

**Box 1. Remittances and forced savings: the Bracero program**

On June 23, 1942 the US signed a bilateral program with Mexico, the Bracero program, and over the next 22 years, some 4.6 million Mexicans were admitted to the US as braceros, or guest workers, to fill jobs in US farms.

During the first phase of the Bracero program, the US government guaranteed bracero contracts, meaning that the US government would pay wages owed to Mexican workers if US farmers failed to do so. A second feature of the program was forced savings. The 256,000 Mexicans who received contracts to work as braceros in the US between 1942 and 1949 had 10 percent of their US wages withheld by US employers and forwarded via the Wells Fargo Bank and Union Trust Company of San Francisco to the Bank of Mexico and then to the Banco de Credito Agricola in Mexico.

The theory was that, because of these forced savings, braceros would arrive home with at least some savings. In 1948, a new agreement had US employers issuing the bracero a check for money withheld when the work contract expired, and the check was to be validated when the bracero returned to Mexico. The 10 percent deductions stopped in 1950.

*Source: Migration Dialogue*

Yet, this is not to say that governments cannot do anything to increase the development impact of remittances especially if we open the door to consider indirect policy interventions; that is, policies that try to change the incentives of remittances recipients to use their resources in one or another way. For example, as noted by Burnside and Dollar (2002), if one considers a modified neoclassical model with imperfect international capital markets, the impact of an international income transfer (such as a remittance flow) on the growth rate of the recipient economy will depend on whether the transfer is invested or consumed. Whenever the income transfer is invested it will positively affect growth whereas if consumed it will have no impact.

The critical link, however, is that in this context the incentive to invest and its subsequent productivity will depend on the policy environment. Good policy environments will increase the return of investment and hence will raise the opportunity cost of consumption. On the contrary, a bad policy environment will drive down the return of investment (or increase the risk associated to a given return) and lower the opportunity cost of consumption. Put in other words, in the

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112 All Mozambican mine workers to South Africa are forced to repatriate 60 percent of income for 6 months of the year, while Lesotho mineworkers are forced to repatriate 30 percent for 10 months. Thereafter they are assumed to only remit 15 percent of income per month.
context of this simple model the impact of the international transfer on growth rate will depend on the policies being implemented by the country. Policy makers therefore can potentially affect the impact that an international income transfer has on growth by introducing appropriate changes to the policy environment.

Indeed, at the empirical level, Burnside and Dollar (2000) find that a specific international income transfer, aid, has a more positive impact on growth in good policy environments. Moreover, they also show that that this effect goes beyond the direct impact that good policies themselves have on growth. In a follow up paper, Burnside and Dollar (2004) also conclude that there is far more evidence to support the idea that it is complementarity between aid and good policies what matters for growth than for the competing hypothesis that aid has the same positive effect in all institutional environments.

The idea that a package of policies (or an appropriate combination of policies and exogenous factors) can be more than the sum of its parts is not new in the economics literature (see Perry et al. 2006 for a review). In fact, there is now some evidence that from an economic development point of view, what matters is not only the "quantity" of an implemented policy but also the overall policy mix. For example, Gallego and Loyza (2002) estimate that good performers which jointly implement a series of growth promoting measures and eliminate bottlenecks in different areas at the same time might achieve growth rates that exceed by more than 1 percentage point the sum of the contributions of each policy reform if implemented in isolation. Similarly, Calderon and Fuentes (2005) find that in effect institutional quality seems to play a significant role in explaining the impact on growth of both financial sector liberalization and openness to trade.

Put in other words, in order to gain knowledge about the impact that one policy has on growth one needs to also know the rest of the policy package. This chapter explores these issues following a similar approach to the one in Burnside and Dollar (2000) but focusing on whether there may be complementarities between a surge of remittances, which we treat as an exogenous factor for policy makers, and the implementation of policies in a number of areas. That is, unlike in chapter 3 where we explore whether in general remittances tend to accelerate growth rates, our concern now is whether developing countries could benefit from an "extra bonus" in terms of growth when remittances are accompanied by progress on a number of policy areas.

The rest of the chapter is structured as follows. In Section II we review a number of areas that are susceptible of being complements to remittances when the objective is achieving a faster growth rate. In the section we also assess whether the Latin American countries have room to make progress on those particular areas. Note that this assessment is critical from a policy making point of view because it measures the extent to which countries can exploit the potential complementarity in the future. In Section III we review the empirical strategy and present the results for our growth equations. It is worth noting that our main argument is that policy makers can affect the incentives that recipients of remittances have to invest them. Thus in Section IV we explore that hypothesis and present the results of empirical models relating the investment rate to remittances. Finally, the chapter is closed in Section V with some concluding remarks.

Note that this does not imply that we treat remittances as an exogenous variable in our empirical models relating growth to remittances, but instead that policy makers treat them as given.
II. Policy areas that may complement remittances

In the previous section we have argued that there may be a number of areas where progress may result in an "extra bonus" in the presence of remittances. Clearly, one natural question that emerges from this discussion regards which policies are likely to be the most critical in this context. Here we explore the potential role of interventions in four areas: education, institutions, the financial sector, and macroeconomic distortions. We next try to motivate each of them.

Policy complementarities and education

Education is typically considered as an important growth determinant. In addition to participating as an input in the production process it can also determine the rate of technological innovation and facilitate the absorption of technologies. Moreover, education also appears as an important complement of the growth process. For example, the flagship report of the Latin American region *Closing the Gap in Education and Technology*, argued that the interaction between technology and skills is critical in determining growth, productivity, and the distribution of earnings across individuals. In fact, when that report explores whether there is evidence suggesting that low levels of skills can be a constraint to technology through trade and FDI, the answer is a clear "yes".

The academic literature has also devoted significant attention to the topic recently. For example, Levin and Raut (1997) showed the existence of a high degree of complementarity between human capital and growth in the export sector for a sample of semi industrial countries. They justify this result noting that it is likely that the export sector can utilize human capital more efficiently than the rest of the economy. This can be the case if for example, educated workers are better able to adapt quickly to the more sophisticated technologies and rapid production changes required for maintaining competitiveness in world markets. Similarly, using an analogous approach to Levin and Raut's (1997), Borensztein et al. (1998) present evidence of complementarity between FDI and human capital. That is, FDI would contribute to higher productivity and higher economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host country.

Why is this aspect important in the Latin American context? There are two main reasons. The first is because to the extent that education drives up the returns to physical investment it will imply that ceteris paribus for a given remittance flow, the higher the educational level of the country in question the higher the share of remittances devoted to investment and therefore the higher the growth rate associated to the remittances in question. The second reason is that, as noted in *Closing the Gap in Education and Technology*, even if the Latin American picture regarding net primary enrollment rates is quite encouraging, most Latin American countries have massive deficits in net enrollments in secondary education (see figure 8.1). Moreover, most of these educational deficits are also apparent even after controlling for income levels. In fact, for the region and controlling for per capita income levels the secondary enrolment deficit would be estimated at about 19 percent. For tertiary education, the estimated deficit would be lower but still above 10 percent.
Figure 8.1. Secondary net enrollment deficit in selected Latin American countries

Source: Closing the Gap in Education and Technology.

Policy complementarities and institutions

A second area that has received significant attention as a potential policy complement in the growth literature is institutional quality. Institutions, understood as the rules and norms constraining human behavior (North, 1990), would basically establish the rules of the game for a society. The importance of institutions in the process of development has long been understood—going back to the writings of Adam Smith. More recently, however, it has been argued that growth-enhancing policies, including in the areas of human capital accumulation and trade openness, are less likely to be effective where political and other institutions are weak. As a result, the adverse effects of weak institutions on economic performance are reinforced by their interaction with other policies.\(^\text{114}\) Thus could it also be the case that because of low institutional quality recipients of remittances tend to invest less and therefore remittances have little or no impact on growth?

A second question would be related to the extent to which Latin American countries could make progress on this front. To explore this issue Figure 8.2 plots the average for the six indices contained in the Kaufman, Kraay and Mastruzzi (2005) database of institutional quality against the log per capita income level of each country. The figure indicates that there is a very close association between per capita income levels and institutional quality, something that in turn would suggest that a comparison of institutional quality based on absolute indicators may be misleading. Yet, it also appears that a large number of the Latin American countries in the sample are below the regression line, an indicator of underperformance on the institutional front and therefore of potential progress.

\(^{114}\) For example, "Economic Growth in the 1990s, Learning from a Decade of Reform" argues that the effectiveness of financial liberalization on growth depends to a large extent on the underlying institutions: intermediaries, markets, and the informational, regulatory, legal and judicial framework. This same point is made by Calderon and Fuentes (2005) who explore whether the empirical evidence is supportive of this view finding that in effect institutional quality seems to play a significant role to understand the impact of both financial sector liberalization and openness to trade on growth.
Policy complementarities and the financial sector

There is now ample evidence from firm-level, industry-level and cross-country studies that financial development and well-functioning financial systems promote long-run growth. They influence economic efficiency and economic growth through different channels. Financial markets facilitate risk diversification by trading pooling, and hedging financial instruments. In this regard the impact of major economic shocks on the economy and therefore the risk faced by investors will be determined in a large measure by the role played by domestic financial markets, which together with world financial markets are perhaps the most important absorbers or amplifiers of external shocks.

The financial sector can also be critical to identify profitable investment projects and mobilize savings, which in principle could be related to remittances. Thus even if the recipient of remittances do not feel like undertaking an entrepreneurial activity but still is willing to save, the financial sector can facilitate the intermediation between that individual and those willing to take investment risks. Thus other things being equal one could expect that for a given flow of remittances, investment (and therefore growth) would be higher in countries with a more developed financial sector.

However, in this area it is also possible that remittances and financial sector development substitute for each other. In fact, with perfect capital markets, investment decisions in physical or human capital would depend on the expected returns of the investment and on the associated cost. When the returns are higher than the cost of capital, an individual would have the same incentive to invest regardless of his or her initial income level: poor people could always borrow the capital they need to make the investment and then repay the loan out of the returns of the investment.

However, in real life and especially in less developed countries to which remittances are likely to flow - capital and financial markets are plagued with imperfections. In many economies
large segments of the population may have not access to credit at all. The poor, for instance, may be constrained because of their lack of assets to be used as collateral, which may be required to gain access to credit. This is likely to be a larger issue if the institutional framework is such that financial operators find it difficult to enforce contracts, and make individual’s access to credit conditional on their initial wealth (i.e. those with low or none initial wealth may be excluded from capital markets). Moreover, even among those with access to credit there are important differences. Since deposit rates tend to be much lower than borrowing rates the opportunity cost of capital is lower for those who need to borrow less. This would imply that even if both a rich and poor person face a similar rate of return on a project, it is likely that the rich will invest much more than the poor. In other words, the opportunities and costs of borrowing can be very different for rich and poor people and play against the latter group.

Imperfect capital markets coupled with fixed costs will imply that important segments of the population may get excluded from investing in physical and human capital. For example, Banerjee and Newman (1994) stress the impact that an individual’s initial wealth has on the level of physical investment when there are credit constraints. Thus capital market imperfections coupled high poverty rates might result in low investment rates and hence in lower growth. A similar point is made by Galor and Zeira (1993), who note that a number of people at the bottom of the distribution may be in a situation where they can neither cover the cost of education nor access the financial sector to borrow for that purpose. As a result high poverty rates will result in low educational outcomes because poor individuals will likely opt out of the education sector and work as unskilled low-return-labor.

In this context, increases in remittances flows particularly if directed towards the poor that are excluded from the financial sector due to market imperfections, would have the effect of making the budget constraints of those individuals less binding and therefore would allow them to undertake investments (both in human and physical capital). Thus, higher remittances would result in higher growth in this case. Yet, if one considers the extreme case (and admittedly not very realistic in real life) of an economy without capital market imperfections, it is possible that remittances have no impact on growth, because all the profitable investment activities would have already taken place.

Similarly, for given levels of poverty and remittances, increases in financial sector development will lead to faster growth rates. In addition to the direct growth effect of a better developed financial sector, progress on this front would allow more individuals at the bottom of the distribution to participate in the investment and growth processes. Yet, going again to an extreme case, if nobody is constrained because the country is awash with remittances a more developed financial sector will have no impact.

Thus in principle it is not clear whether remittances will have more or less of a growth impact on growth in a country with a more or less developed financial sector. How does Latin America score in this area? The truth is that the region has significant room to improve. Figure 8.3 reports the ratio of domestic credit to the private sector to GDP for the six development regions of the world. Inspection of this figure indicates that in the 2004, Latin America is the region with the lowest ratio: below 26 percent of GDP. This contrasts sharply with what is found for high income countries where credit to the private sector is around 120 percent of GDP. Note

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that even Sub Saharan Africa has a ratio larger than LAC – although it is mostly driven by South Africa, where credit is 141 percent of GDP.

**Figure 8.3. Domestic credit to the private sector.**

Source: Own calculations using WDI data.

*Policy complementarities and macroeconomic distortions*

Following the approach in Burnside and Dollar (2000), the final set of policies that we consider as potential complements of remittances in their impact on growth is that associated with macroeconomic policy distortions. As noted above the larger the distortions the lower the incentives that recipients of remittances have to invest. As indicators of macroeconomic policies we compute an index (see below) that weights trade openness, inflation and government consumption as a measure of the government burden on the economy.

**Figure 8.4. Regional policy index.**

*Note:* A higher value (i.e. closer to 0) indicates a better policy index.
*Source:* Own calculations.

Figure 8.4 plots this policy index by region, for the periods 1996-2000 and 2001-05. The index is constructed in such a way that higher values (closer to 0) would imply that the region in question is implementing better policies. This figure indicates once more that Latin America has considerable room to improve in terms of macroeconomic distortions. In fact, in the first half of the present decade Latin America was, together with the Middle East and Sub-Saharan Africa,
the region with the lowest score. South Asia, East Asia, and Eastern Europe, all present better macroeconomic policy indicators. This should not be a surprise considering that LAC's relatively low levels of trade openness, which tend to drive down our macroeconomic policy index.

III. Empirical evidence

In order to investigate the questions of interest of this chapter we rely on variants of the following basic econometric specification:

\[
growth_{i,t} = \beta_0 X_{i,t} + \beta_1 R_{i,t} + \beta_2 Complement_{i,t} + \mu_t + \eta_i + \epsilon_{i,t} \quad (1)
\]

where \( i \) and \( t \) are a country and time index respectively, \( X \) is a set of control variables (see Box 2) including lagged income levels, \( R \) is the ratio of remittances to GDP, and \( \mu_t \) and \( \eta_i \) are a time and a country effect respectively. Finally \( \epsilon_{i,t} \) is an error term. In (1) \( growth \) is measured in per capita terms and \( Complement \) refers generally to each of the four areas under consideration which may also be included in \( X \). Thus (1) is basically an extension of the model used in Chapter 3 (see table 3.10).

<table>
<thead>
<tr>
<th>Box 2. Control set in the empirical model.</th>
</tr>
</thead>
</table>

The set of growth determinants used in the empirical model is selected from Loayza, Fajnzylber and Calderón (2005). It includes the following variables. Conditional convergence is proxied by the initial value of the GDP per capita (in logs). The ratio of total secondary enrollment (regardless of age) to the population of the age group corresponding to that level is the proxy for human capital. Our source is Barro and Lee (2001) and the World Bank (2005). Financial depth is measured by the stock of claims on the private sector by deposit money banks and other financial institutions, expressed as a ratio to GDP. The data on financial depth was obtained from Beck, Demirgüç-Kunt, and Levine (2000). On the other hand, trade openness is the log of the ratio of exports and imports (in 1995 U.S. dollars) to GDP (in 1995 U.S. dollars). Institutions are proxied by the ICRG index of political risk published by the PRS Group. We also classify the different indices of institutions according to the following groups as in Bekaert, Campbell and Lundblad (2005): political institutions (ICRG1 is the sum of the subcomponents: military in politics and democratic accountability), quality of institutions (ICRG2 is the sum of corruption, law and order and bureaucratic quality), socio-economic environment (ICRG3 is the sum of government stability, socio-economic conditions and investment profile), and conflict (ICRG4 comprises internal and external conflict as well as ethnic and religious tensions). In addition to indicators of structural policies and institutions, we include the average annual CPI inflation rate (Source: World Bank, 2002) as a proxy of lack of price stability, and the RER overvaluation as a proxy for external imbalances. Finally, the external conditions are captured by terms of trade shocks and period-specific shifts. The first variable is approximated by the log difference of the terms of trade and the data is taken from World Bank (2005). The second variable is approximated using time-dummy variables, which are not reported in our regression results.
In equation (1) our main interest centers on the value of the parameter $\beta_2$. Note that with this set up, the marginal impact of a change in remittances on growth is given by 
$$\frac{\partial \text{growth}}{\partial R} = \beta_1 + \beta_2 \cdot \text{Complement}.$$ 
Thus when $\beta_2$ is positive, this will be an indication that in general the higher the value of the index for the complementary policy in question the higher the impact of remittances on growth. It is also worth noting that when $\beta_2 \neq 0$, then $\beta_1$ can take values smaller than 0, since for remittances to have a positive impact on growth all that it is required is that $\beta_1 + \beta_2 \cdot \text{Complement} > 0$. We next move to explore what the empirical evidence has to say on this issue.

**Remittances, Human Capital and Economic Growth**

In our first experiment we test whether there are complementarities between education and remittances for the growth process. Empirically, we replace $\text{Complement}$ in (1) with our indicators of human capital: enrollment rates in primary and secondary schooling. Table 8.1 presents the estimation results for enrollment rates in each level of education as well as for three different sets of estimates depending upon the specific instrument used to control for potential reverse causality from growth to remittances. More specifically and as done previously in this report we rely on the Distance and Migration instruments first introduced by Aggarwal, Demiguc-Kunt, and Martinez Peria (2005). In all the cases, the models are estimated using a system GMM-IV estimator. Inspection of this table indicates that in most cases the coefficient of remittances is negative and significant, whereas that corresponding to the interaction between remittances and education is positive and also significant.\(^{115}\) This implies that the growth benefits of remittances rise as the level of human capital increases. In other words, education and remittances seem to be complementary factors in the growth process.

The estimates in table 8.1 can also be used to compute the educational threshold for which remittances have no impact on growth. For example, using the estimates corresponding to secondary schooling and the Distance instrument we find this threshold at a low 27 percent (located in the 40th percentile of the distribution of secondary enrollment in our developing country sample). Beyond this critical level, remittance-recipient countries would start reaping growth benefits. In fact, the marginal growth impact of remittances for the median countries in the distribution of secondary enrollment rates is 0.04, with a one standard deviation increase in remittances generating an increase in growth rate of 7 basis points. In contrast, countries with enrollment rates in the 75th percentile of the distribution have a marginal impact of remittances on growth of 0.19 percent per year.

\(^{115}\) To save space and lower the technicality of the discussion we do not discuss the results of the specification tests (Sargan test of overidentification and test for second order serial correlation). Yet, it is worth noting that the tests do not reveal any particular problem with the specification of the model.
### Table 8.1. Remittances, Education and Economic Growth

<table>
<thead>
<tr>
<th>Variable</th>
<th>Primary Schooling</th>
<th>Secondary Schooling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remittances</td>
<td>Instrument</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instrument</td>
</tr>
<tr>
<td>Transitional Convergence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial GDP per capita (in logs)</td>
<td>-0.501 **</td>
<td>-0.588 **</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.09)</td>
</tr>
<tr>
<td>Macroeconomic Policies and Institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>2.831 **</td>
<td>2.032 **</td>
</tr>
<tr>
<td></td>
<td>(0.53)</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Financial Depth</td>
<td>0.345 **</td>
<td>1.072 **</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Institutions</td>
<td>3.224 **</td>
<td>2.872 **</td>
</tr>
<tr>
<td></td>
<td>(0.31)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>Trade Openness (TO)</td>
<td>0.179</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td>(0.19)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>Lack of Price Stability (inflation rate, in log[100+inf.rate])</td>
<td>-0.010 **</td>
<td>-0.009 **</td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>RER Overvaluation (Proportional index in logs, overvaluation if &gt;0)</td>
<td>-0.014 **</td>
<td>-0.013 **</td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Government Burden (General Govt. Consumption in logs)</td>
<td>-0.756 **</td>
<td>-0.735 **</td>
</tr>
<tr>
<td></td>
<td>(0.20)</td>
<td>(0.19)</td>
</tr>
<tr>
<td>Workers' Remittances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-8.840 **</td>
<td>-4.164 **</td>
</tr>
<tr>
<td>(Workers Remittances to GDP, in logs)</td>
<td>(1.69)</td>
<td>(1.40)</td>
</tr>
<tr>
<td>Remittances and Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances * Education</td>
<td>1.834 **</td>
<td>0.960 **</td>
</tr>
<tr>
<td></td>
<td>(0.38)</td>
<td>(0.32)</td>
</tr>
</tbody>
</table>

Note: the table reports the results of regressing per capita growth on the variables in the variables in the first column using the GMM system estimator. For all the variables we use internal instruments except for remittances that can be treated as exogenous or instrumented with the Distance or Migration Instrument of Aggarwal, Demiguc-Kunt, and Martinez Peria (2005). Source: Author's calculations.
Panel A of Figure 8.5 plots the growth response of higher remittances as a function of the level of secondary schooling across developing regions and across regions. It shows that, ceteris paribus, regions with higher rates of enrollment in secondary education display the largest potential growth benefits associated to surges in remittances. A one standard deviation increase in the ratio of remittances to GDP would raise the growth rate of Eastern Europe by 33 basis points per year while, on average, annual growth in East Asia and Latin America would be higher by .26 and .25 percent per year, respectively. In panel B of figure 8.5, we repeat the same exercise but now focusing on Latin American countries. This panel indicates that there is substantial variation in the growth benefits of remittances across countries, a reflection of the significant differences in human capital within the region. For instance, 9 out of 19 countries with data on secondary enrollment for 2000 have a growth response to higher remittances below the average response for Latin America. Guatemala is the country with the smallest potential response—an increase in the growth rate of 0.08 percent per year. On the other hand, Brazil and Argentina have the largest potential growth benefits due to higher remittances (between 0.34 and 0.37 percent per year), with growth effects slightly larger than the ones observed by the average in Eastern Europe.

**Figure 8.5. Growth, education and remittances: Impact of a one std. dev. increase in remittances**

*Panel A. Regions of the world*

<table>
<thead>
<tr>
<th>Region</th>
<th>Growth Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>0.14</td>
</tr>
<tr>
<td>LAC</td>
<td>0.25</td>
</tr>
<tr>
<td>EAP</td>
<td>0.26</td>
</tr>
<tr>
<td>ECA</td>
<td>0.33</td>
</tr>
<tr>
<td>MENA</td>
<td>0.22</td>
</tr>
<tr>
<td>SA</td>
<td>0.14</td>
</tr>
</tbody>
</table>

*Panel B. Latin American Countries*

<table>
<thead>
<tr>
<th>Country</th>
<th>Growth Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTM</td>
<td>0.14</td>
</tr>
<tr>
<td>SLV</td>
<td>0.18</td>
</tr>
<tr>
<td>NIC</td>
<td>0.21</td>
</tr>
<tr>
<td>ECU</td>
<td>0.23</td>
</tr>
<tr>
<td>DOM</td>
<td>0.24</td>
</tr>
<tr>
<td>PRY</td>
<td>0.25</td>
</tr>
<tr>
<td>CRI</td>
<td>0.26</td>
</tr>
<tr>
<td>PAN</td>
<td>0.27</td>
</tr>
<tr>
<td>VEN</td>
<td>0.28</td>
</tr>
<tr>
<td>COL</td>
<td>0.29</td>
</tr>
<tr>
<td>SUR</td>
<td>0.30</td>
</tr>
<tr>
<td>MEX</td>
<td>0.31</td>
</tr>
<tr>
<td>Bol</td>
<td>0.32</td>
</tr>
<tr>
<td>TTO</td>
<td>0.33</td>
</tr>
<tr>
<td>PER</td>
<td>0.34</td>
</tr>
<tr>
<td>GUY</td>
<td>0.35</td>
</tr>
<tr>
<td>ARG</td>
<td>0.36</td>
</tr>
<tr>
<td>BRR</td>
<td>0.37</td>
</tr>
<tr>
<td>HBA</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Source: Author's calculations.
A complementary interpretation of the above results is that the impact of progress on the educational front is amplified when remittances are higher. Thus, the growth effect of increases in secondary enrollment rates in countries which start from low levels would be even larger if remittances flows are considerable. To get an idea, assume that Guatemala, El Salvador and Nicaragua (lowest levels of secondary enrollment in 2000) reform their educational system and raise their enrollment rates to the median level in the region (Colombia, 70 percent enrollment rate in secondary schooling in 2000). The growth benefits of this change, in excess to those attributed to their high remittances (i.e. the extra bonus), would range between .07 percent per year (El Salvador and Nicaragua) and .17 percent (Guatemala).

**Remittances, Institutions, and Economic Growth**

In our second experiment we explore the potential complementarity between remittances and institutions and to this end we rely on the ICRG index of political risk published by the PRS Group to proxy for our Complement variable in (1). In this subsection we also look at two of the components of this overall index of institutions in order to test the forces behind the impact of institutions and remittances on growth. Specifically, we use the indices of political institutions and the socio-economic environment. The former sub-index, captures the responsiveness of the government to its people. The latter sub-index, on the other hand, comprises information on the government’s ability to carry out its programs and stay in office, the socio-economic pressures at work in society that could restrain government actions, and factors affecting risk to investment (such as contract expropriation, profits repatriation, and payment delays).

Table 8.2 reports the estimates for this specification for each of the indices under analysis using once again the Distance and Migration variables to instrument for remittances.\(^{116}\) The first three columns of Table 8.2 correspond to the Distance instrument, whereas the latter three columns use the Migration instrument. Inspection of this table indicates that both groups of estimations show analogous results. The estimates in the table also indicate that the parameter of remittances enters the specification with a negative (and statistically significant) sign. Similarly, the parameter corresponding to the interaction term is always positive and significant suggesting that the marginal impact of remittances is higher for countries with higher levels of institutional quality.

Figure 8.6 shows the effects of a surge of remittances by region taking into account their average institutional levels. In each case we assume a positive shock equivalent to a one-standard deviation to remittances. The simulations indicate that in Latin America an increase in remittances would lead to a higher growth rate of .5 percent per year, only surpassed by Eastern Europe (about .63 percent) and only slightly by the Middle East (0.52 percent). The poor institutional records of Sub-Saharan Africa and South Asia would be reflected on their lower potential growth benefits across regions—all .36 and .25 percent respectively.

\(^{116}\) Although the results are not reported, we should note that when treating remittances as exogenous the results were qualitatively similar.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Using the &quot;Distance&quot; Instrument for Remittances</th>
<th>Using the &quot;Migration&quot; Instrument for Remittances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICRG Political Risk Index</td>
<td>Political Institutions</td>
</tr>
<tr>
<td>Initial GDP per capita (in logs)</td>
<td>-0.274 **</td>
<td>-0.511 **</td>
</tr>
<tr>
<td></td>
<td>(0.09)</td>
<td>(0.13)</td>
</tr>
<tr>
<td><strong>Macroeconomic Policies and Institutions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (in logs)</td>
<td>0.426 *</td>
<td>1.106 **</td>
</tr>
<tr>
<td></td>
<td>(0.24)</td>
<td>(0.30)</td>
</tr>
<tr>
<td>Financial Depth (in logs)</td>
<td>0.254 *</td>
<td>0.359</td>
</tr>
<tr>
<td>(Private Domestic Credit to GDP, in logs)</td>
<td>(0.13)</td>
<td>(0.28)</td>
</tr>
<tr>
<td>Institutions</td>
<td>4.304 **</td>
<td>1.241 **</td>
</tr>
<tr>
<td>(ICRG Political Risk Index, in logs)</td>
<td>(0.36)</td>
<td>(0.24)</td>
</tr>
<tr>
<td>Trade Openness (TO)</td>
<td>0.524 **</td>
<td>0.386 **</td>
</tr>
<tr>
<td>(Real Exports and Imports to GDP, in logs)</td>
<td>(0.15)</td>
<td>(0.19)</td>
</tr>
<tr>
<td>Lack of Price Stability (inflation rate, in log[100+inf.rate])</td>
<td>-0.007 **</td>
<td>-0.004 *</td>
</tr>
<tr>
<td>(Proportional index in logs, overvaluation if &gt;0)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>RER Overvaluation</td>
<td>-0.012 **</td>
<td>-0.009 **</td>
</tr>
<tr>
<td>Government Burden (General Govt. Consumption in logs)</td>
<td>-1.121 **</td>
<td>-0.768 **</td>
</tr>
<tr>
<td><strong>Workers’ Remittances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances (Workers Remittances to GDP, in logs)</td>
<td>-2.877 **</td>
<td>-0.840 *</td>
</tr>
<tr>
<td></td>
<td>(1.22)</td>
<td>(0.50)</td>
</tr>
<tr>
<td><strong>Remittances and Institutions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances * Institutions</td>
<td>0.760 **</td>
<td>0.557 **</td>
</tr>
<tr>
<td></td>
<td>(0.30)</td>
<td>(0.28)</td>
</tr>
</tbody>
</table>

Note: the table reports the results of regressing per capita growth on the variables in the variables in the first column using the GMM system estimator. For all the variables we use internal instruments except for remittances that are instrumented with the Distance or Migration Instrument of Aggarwal, Demiguc-Kunt, and Martinez Peria (2005). Source: Author’s calculations.
Across Latin American countries, the growth response to higher remittances also varies significantly. Countries with poorer institutions, such as Venezuela, only observe their growth rates increase by approximately 0.2 percent per year following an increase in remittances. On the other hand, countries with better institutions, like Costa Rica, would experience surges in growth rates higher than 0.7 percent per year. Our findings here indicate that if countries improve their overall institutional framework, remittances can be further allocated into productive activities and, hence, foster growth. For instance, if Latin American countries were to improve their institutional framework to the levels displayed by the regional leaders, growth gains would range from 0.1 percentage points (Panama) to more than 0.5 percentage points per year (Venezuela).
Remittances, Financial Depth, and Economic Growth

As discussed above, from a theoretical point of view it is not clear whether remittances and financial sector development should complement or substitute each other. To empirically explore this issue, Table 8.3 reports the results of a growth regression that includes an interaction term between workers' remittances and measures of financial development such as domestic credit to the private sector and liquid liabilities and money as a percentage of GDP. The first three columns of this table present the results for "Private Credit." As in previous tables each column corresponds to a different instrument set for our remittance variables. The results indicate that remittances promote growth, but that the effect declines as the financial system becomes deeper — that is $\beta_1 > 0$ and $\beta_2 < 0$. This finding is robust to the use of private credit or liquid liabilities as measures of financial development.

For instance, for Argentina the growth benefits of an increase in remittances is 0.46 percentage points for Argentina; for Peru it would be of 0.38 percent and for Brazil of 0.32 percent. These three countries roughly correspond to the 25, 50 and 75 percentile of the distribution of our financial development proxy. It is worth noting, however, that our estimates in Table 8.3 suggest that the impact of remittances on growth is always positive (the marginal impact of remittances on growth would turn negative for levels of financial development that are above the maximum value of that variable in our sample).

Which reasons can be behind these results? Although it is difficult to say from a single regression like this, one can hypothesize that the substitutability between remittances and financial depth is likely to reveal problems of access to credit by poorer households (especially those located in rural areas and devoted to agricultural activities), who may use remittances to finance high-return projects in their portfolio (e.g. human capital accumulation). In other words, remittances would make the budget constraint faced by the poor less binding, and this would be more important in countries with less developed financial sectors where the poor will have even less access to credit. In fact these results are in line with the findings of Giuliano and Ruiz-Arranz (2005) where remittance-driven growth is higher in countries with less developed financial systems.

Clearly, this should not be interpreted as an indication that countries should move towards shallower financial sectors. As it is clear from table 8.3 (and more generally from the growth literature), a well developed financial sector is a critical element in any growth strategy. If anything this result would indicate that countries experiencing a decline in remittances can partially make up for it by further developing the financial sector.

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117 As in previous exercises we assume that remittances increase by one standard deviation.
Table 8.3. Remittances, the Financial Sector and Economic Growth

<table>
<thead>
<tr>
<th>Variable</th>
<th>Private Credit</th>
<th>Liquid Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exogenous Remittances</td>
<td>Distance Instrument</td>
</tr>
<tr>
<td>Initial GDP per capita (in logs)</td>
<td>-0.453 ** (0.13)</td>
<td>-0.420 ** (0.12)</td>
</tr>
<tr>
<td>Education (in logs)</td>
<td>0.968 ** (0.25)</td>
<td>1.025 ** (0.24)</td>
</tr>
<tr>
<td>Financial Depth (Private Domestic Credit to GDP, in logs)</td>
<td>0.207 (0.18)</td>
<td>0.024 (0.18)</td>
</tr>
<tr>
<td>Institutions (ICRG Political Risk Index, in logs)</td>
<td>4.167 ** (0.31)</td>
<td>4.368 ** (0.31)</td>
</tr>
<tr>
<td>Trade Openness (TO) (Real Exports and Imports to GDP, in logs)</td>
<td>0.304 ** (0.12)</td>
<td>0.400 ** (0.12)</td>
</tr>
<tr>
<td>Lack of Price Stability (inflation rate, in log[100+inf.rate])</td>
<td>-0.010 ** (0.00)</td>
<td>-0.008 ** (0.00)</td>
</tr>
<tr>
<td>RER Overvaluation (Proportional index in logs, overvaluation if &gt;0)</td>
<td>-0.011 ** (0.00)</td>
<td>-0.011 ** (0.00)</td>
</tr>
<tr>
<td>Government Burden (General Govt. Consumption in logs)</td>
<td>-0.874 ** (0.16)</td>
<td>-0.857 ** (0.16)</td>
</tr>
</tbody>
</table>

**Workers' Remittances**

| Remittances | 0.408 ** (0.14) | 0.538 ** (0.15) | 0.469 ** (0.15) | 1.355 ** (0.16) | 1.327 ** (0.16) | 1.395 ** (0.15) |
| (Workers Remittances to GDP, in logs) | (0.04) | (0.04) | (0.04) | (0.05) | (0.04) | (0.04) |

**Remittances and Financial Development**

| Remittances * Financial Var. | -0.077 * (0.04) | -0.100 ** (0.04) | -0.074 * (0.04) | -0.351 ** (0.04) | -0.331 ** (0.04) | -0.314 ** (0.04) |
| (Workers Remittances to GDP, in logs) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |

Note: the table reports the results of regressing per capita growth on the variables in the variables in the first column using the GMM system estimator. For all the variables we use internal instruments except for remittances that are treated as exogenous, or instrumented with the Distance or Migration Instrument of Aggarwal, Demirguc-Kunt, and Martinez Peria (2005). Two financial variables are interacted with remittances in the regression, private credit and liquid liabilities. Source: Author’s calculations.
We have already discussed above the arguments put forward by Burnside and Dollar (2000, 2004) arguing that the effectiveness of international aid on raising the growth rate of the economy may depend on a sound economic policy environment that does not generate macroeconomic uncertainty. A similar argument is also made by Faini (2002) for remittances.

To further explore this possibility we follow Burnside and Dollar (2000) and use the coefficient estimates of the baseline growth regression reported in the first column of Table 3.10 in Chapter 3 to construct a policy environment index that comprises trade openness, inflation, and government burden:

$$Pol = 0.329 \times \text{Trade Openness} - 0.0073 \times \text{Inflation} - 0.862 \times \text{Government Burden}.$$  

In this setup higher (lower) values of Pol indicate a good (bad) policy environment, characterized by less (more) policy distortions and to the extent that a good policy environment is a complement of remittances we would expect a positive and significant coefficient for the parameter of the interaction term. Clearly, in this index trade openness is associated with a good policy environment whereas inflation and the government burden with a bad one.

Table 8.4 reports the results of the regression analysis where we replace the indicators of trade openness, inflation and government burden with our policy environment index. The first three columns present the base results including the Pol indicator, whereas in the fourth to sixth columns we include its interaction between remittances as an additional explanatory variable. Inspection of this table indicates that the coefficient estimates for the growth determinants have the expected sign: (a) there is conditional convergence, (b) growth is fostered by higher education, deeper financial markets, better institutions and a sound economic policy environment, and (c) growth is hindered by higher levels of real exchange rate overvaluation.

As seen in table 8.4, the parameter of remittances continues to be positive and significant with this specification. Our point estimates indicate that a one percent increase in remittances would lead to an increase in per capita growth of about .2 percent. Moreover, when the interaction term is included in the regression not only do we find that remittances still exert a positive impact on growth, but also that remittances are more effective in enhancing growth prospects in countries with better economic policies (as captured by our policy index). Our estimates suggest that a one-standard-deviation increase in workers’ remittances will raise the rate of growth in the recipient country by 0.32 percentage points for countries in the 25th percentile of the distribution of policy environment. Growth benefits are only slightly larger for countries in the median and 75th percentile (0.35 and 0.38 percentage points per year, respectively).
Table 8.4. Remittances, the Policy Environment and Economic Growth

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline Regression</th>
<th>Interacting Remittances and Policy Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial GDP per capita (in logs)</td>
<td>-0.177 *</td>
<td>-0.161 *</td>
</tr>
<tr>
<td>Education (Secondary Enrollment, in logs)</td>
<td>0.349 **</td>
<td>0.343 **</td>
</tr>
<tr>
<td>Financial Depth (Private Domestic Credit to GDP, in logs)</td>
<td>0.364 **</td>
<td>0.279 *</td>
</tr>
<tr>
<td>Institutions (ICRG Political Risk Index, in logs)</td>
<td>4.057 **</td>
<td>4.204 **</td>
</tr>
<tr>
<td>Policy Index 1/ (Openness, Inflation, Govt. Burden)</td>
<td>0.998 **</td>
<td>1.027 **</td>
</tr>
<tr>
<td>RER Overvaluation (Proportional index in logs, overvaluation if &gt;0)</td>
<td>-0.019 **</td>
<td>-0.019 **</td>
</tr>
<tr>
<td>Remittances (Workers Remittances to GDP, in logs)</td>
<td>0.213 **</td>
<td>0.245 **</td>
</tr>
<tr>
<td>Remittances * Policy Index (Remittances and Policy Environment)</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Note: the table reports the results of regressing per capita growth on the variables in the variables in the first column using the GMM system estimator. For all the variables we use internal instruments except for remittances that are treated as exogenous, or instrumented with the Distance or Migration Instrument of Aggarwal, Demirci-Kunt, and Martinez Peria (2005). Source: Author’s calculations.
Figure 8.7 reports the growth response to higher remittances conditional on the economic policy environment of the recipient country and region. We observe that, on average, the growth response in Latin America —an increase in growth rate by .36 percent— is in line with the average response of the developing countries as well as the Middle East and North Africa region. According to figure 8.7, the region that would benefit the most from a surge in remittances given its policy environment would be East Asia, where an increase of (one standard deviation in) remittances would be associated with a growth acceleration of .42 percent. This finding conforms to the discussion in Section II where we argued that the East Asian and Pacific region has the best policy indices. Within the Latin America region, growth benefits would be higher for those countries with better economic policy environments — e.g. Mexico or El Salvador (Panel B).

Figure 8.7. Growth, the policy environment and remittances. Growth impact of a 1-sd increase in remittances

Panel A. Regions of the world

Panel B. Latin American Countries

Source: Author’s calculations
IV. Remittances and Domestic Investment.

The argument used in this chapter to justify the complementarity in the growth process between remittances and other policy interventions relies on the idea that when some conditions are present in home countries those at the receiving end of remittances flows will have more incentives to invest the corresponding funds. It is thus natural to test whether the complementarities between remittances and other policies also extend to the determinants of domestic investment. In order to investigate this possibility we now proceed to estimate an empirical model that relates the investment rate to a set of controls, remittances, and an interaction between remittances and the variables used in the previous section to capture progress in the four different policy areas under analysis. That is, our model now is:

\[
\text{Investment rate}_{i,t} = \beta_0 Z_{i,t} + \beta_1 R_{i,t} + \beta_2 R_{i,t} \times \text{Complement}_{i,t} + \mu_i + \eta_t + \epsilon_{i,t} \tag{2}
\]

where now \(Z\) is a set of control variables (see Box 3) including the lagged investment rate and the rest of the notation is as in equation (1).

**Box 3. Control set in the empirical model for the investment rate.**

The empirical equation for the investment rate is based on the simple accelerator model relating the investment rate to per capita GDP growth and the cost of capital, which we proxy with the price of investment goods from the PWT6.1. This basic model is augmented with a number of variables aimed at capturing elements related to the investment climate. More specifically we also include among the explanatory variables the ratio of total secondary enrollment (regardless of age) to the population of the age group corresponding to that level as the proxy for human capital, the stock of claims on the private sector by deposit money banks and other financial institutions, expressed as a ratio to GDP as a measure of financial sector development. The empirical model also includes the ICRG index of political risk to capture country institutional aspects, and the average annual CPI inflation rate as a proxy for the macroeconomic environment. Finally, the model also takes into account potential dynamics in the investment rate by including the lagged dependent variable in the control set.

Table 8.5 reports the results of this new exercise. Each column in the table corresponds to one of the areas identified above as a potential complement to remittances (i.e. education, institutions, financial sector development, and the policy environment) and the reported results as based on the system GMM estimator using the Distance instrument. To a large extent the results echo those found in the previous section for the determinants of growth.

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118 Note in any case, that failure to support this hypothesis would invalidate the results of the previous section.

119 A full set of results can be found in “Remittances, growth, and policy complementarities” by C. Calderon, P. Fajnzylber, and H. Lopez.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Education</th>
<th>Institutions</th>
<th>Financial Sector</th>
<th>Policy Env.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Persistence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagged Investment Ratio</td>
<td>0.503 **</td>
<td>0.648 **</td>
<td>0.549 **</td>
<td>0.589 **</td>
</tr>
<tr>
<td>(in logs)</td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td><strong>Growth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Growth</td>
<td>0.041 **</td>
<td>0.042 **</td>
<td>0.033 **</td>
<td>0.039 **</td>
</tr>
<tr>
<td>(in percentages)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Macroeconomic Policies and Institutions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.101 **</td>
<td>0.056 **</td>
<td>-0.005</td>
<td>0.027 *</td>
</tr>
<tr>
<td>(Secondary Enrollment, in logs)</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Financial Depth</td>
<td>0.061 **</td>
<td>-0.080 **</td>
<td>0.062 **</td>
<td>-0.031 **</td>
</tr>
<tr>
<td>(in logs)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Institutions</td>
<td>-0.099</td>
<td>0.131 **</td>
<td>0.260 **</td>
<td>0.161 **</td>
</tr>
<tr>
<td>(ICRG Political Risk Index, in logs)</td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.08)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Price of Investment</td>
<td>0.026</td>
<td>-0.041</td>
<td>-0.040 *</td>
<td>-0.093 **</td>
</tr>
<tr>
<td>(in logs)</td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Lack of Price Stability</td>
<td>-1.06E-03 **</td>
<td>-1.23E-03 **</td>
<td>-4.64E-04 **</td>
<td>-1.37E-03 **</td>
</tr>
<tr>
<td>(inflation rate, in log[100+inf.rate])</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Workers' Remittances</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances</td>
<td>-0.144 **</td>
<td>-0.491 **</td>
<td>0.076 **</td>
<td>0.067 **</td>
</tr>
<tr>
<td>(Workers Remittances to GDP, in logs)</td>
<td>(0.07)</td>
<td>(0.18)</td>
<td>(0.02)</td>
<td>(0.03)</td>
</tr>
<tr>
<td><strong>Remittances and Complementary Policies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remittances * Complement</td>
<td>0.039 **</td>
<td>0.124 **</td>
<td>-0.023 **</td>
<td>0.030 **</td>
</tr>
<tr>
<td>(0.02)</td>
<td>(0.04)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td></td>
</tr>
</tbody>
</table>

Note: the table reports the results of regressing the investment rate on the variables in the first column using the GMM system estimator. For all the variables we use internal instruments except for remittances that instrumented with the Distance Instrument of Aggarwal, Demigue-Kunt, and Martinez Peria (2005). The heading at the top of each column reports the variable used as Complementary policy. Source: Author’s calculations.
First, remittances and human capital appear to be complementary factors in the process of physical capital accumulation. For instance, the investment effects of remittances are higher as the enrollment rate in schooling increases. Similarly, the marginal impact of remittances on investment is larger for countries with higher levels of institutional quality and better policy environment as captured by our policy index.

On the contrary, and consistently with the findings in Section III, we also found that remittances and the development of the domestic financial market appear to be substitutes in the capital accumulation process. In fact, according to the estimates in table 8.5, the impact of remittances is positive and decreasing as domestic financial markets become deeper. The marginal impact of remittances on investment becomes negative and (in most cases) not statistically significant for higher levels of financial development (beyond 85th and 90th percentiles). Thus, the largest increases in domestic investment driven by remittances take place in less financially developed countries. For instance, for countries with levels of private credit to the domestic sector (as a percentage of GDP) in the 25th percentile of the distribution (2.65 in logs) a one standard deviation increase in remittances would raise the investment coefficient by almost 1 percentage point of GDP – from an average of 20.3 to 21.3 percent of GDP. In turn, this higher investment would be transformed into an increase in the growth rate of the economy of 0.3 percentage points per year. On the other hand, for those countries with an average level of financial development the marginal impact of remittances on investment is 0.015. In this case, an increase in the ratio of remittances to GDP would lead to higher investments by approximately 0.5 percentage points of GDP and this would be transformed, in turn, in a growth increase of 0.17 percent per year.

V. Concluding remarks

In chapter 3 of the report we argued that remittances are likely to have a positive effect on growth and poverty reduction. This chapter has extended the analysis there and has explored the extent to which policy makers can enhance the development impact of remittances by implementing a number of policies that, in addition to being pro growth per se, can also result in an extra bonus in the presence of significant remittance flows.

The results discussed above suggest that the incentives to invest remittances in productive activities may be sensitive to some structural features and economic policies in the remittance-recipient country. More specifically, it has been found that remittances are more effective in raising investment and enhancing growth in countries with higher levels of human capital, strong institutions and good policy environments.

It then follows that in order to maximize the development impact of remittances countries need to (i) maintain sound macroeconomic economic policies; (ii) promote human capital development; and (iii) strengthen the institutional framework. The chapter has also explored whether a more developed financial sector may also complement remittances, but our results are more suggestive of substitution than of complementary effects.
Chapter 9

The Regulatory Framework for Remittances

Remittance transactions are inherently private operations and, as such, regulation does not address in any way the allocation of remittance funds, which receivers clearly have the freedom to spend or invest as they choose. Within this scope, regulatory concerns are aimed at facilitating the provision of formal remittance services at the lowest cost possible to as many users as possible, while maintaining high levels of security in the system. In most cases, regulatory issues are linked to the expansion of formal remittance channels, rather than with the regulation of informal ones, which is inherently difficult.

I. Introduction

For migrants sending money home, remittance services have been traditionally expensive, with fees of up to 20% of the principal sent, depending of the size and type of the transfer and destination. Fees structures themselves have been opaque (with hidden charges and poor exchange rates), and have penalized transfers of small amounts of the type commonly made by migrants. Moreover, cost savings achieved through technological advances in payment systems have not necessarily translated into lower prices for remittance services. Accordingly, reduction of the price of remittances has been considered a major target for many multilateral initiatives and regulatory efforts (see next section). However authorities have shied away from imposing direct price controls in remittance services, favoring mechanisms aimed at increasing transparency, enhancing competition in the system, and reducing barriers for users to access a wider range of service providers. Prices for remittance services have indeed decreased in those corridors where competition is highest, but have remained largely unchanged in corridors with low volume and competition.

Another important dimension of the regulation of remittances is related to the risk of remittance channels being used for illegal purposes, including money laundering (ML) and financing of terrorism (FT). While the same risk is faced by other financial sector activities, anonymous transactions, weak record keeping, non-transparent settlement systems, and the

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* This chapter is based on the background papers prepared for this report “Regulatory Issues related to Facilitating Remittances Flows and Security in the System” by Emanuel Salinas Muñoz, and “The Payment System Infrastructure and Remittances in LAC: Main Issues and Policy Recommendations” by Massimo Cirasino and Mario Guadamillas.

120 Frias, Michael. 2005
absence of regulatory oversight make remittance systems attractive vehicles for illicit activities.\textsuperscript{122} This is especially the case in informal systems, which usually have much weaker security mechanisms.

Regulation aimed at avoiding misuse of the system commonly requires service providers to positively identify their clients and assess the legality of their transactions. Compliance with these regulations is costly, increasing the price of the service for users, and posing barriers to entry or formalization of new Remittance Service Providers (See Box 1). Similarly, these regulations have made many financial institutions reluctant to service sectors of the population that cannot demonstrate lawful residency in the host country which, by some accounts, could be as much as 12 million people in the case of the United States.\textsuperscript{123}

In this respect, the main challenge for authorities is to ensure the integrity of the system by restricting the opportunities for misuse while minimizing the disruption and cost of the service for bona fide participants.

\textbf{Box 1. Formality in the provision of Remittance Services}

It is difficult to distinguish between the “informal” and “formal” remittance systems. Neither its cash basis nor the occasional character of its customer base provide a basis for saying that a transfer in which a person sends money through an unregistered travel agent (informal) is fundamentally different from a similar transaction conducted through a credit union (formal). Definition problems are compounded by the lack of consensus about terminology, ranging from “informal funds transfer systems,” “alternative remittance systems,” “underground banking,” “ethnic banking,” to “informal value transfer system”.\textsuperscript{124}

Although it is difficult to distinguish between the “formal” and “informal” sector, a clear distinction is whether or not a regulatory framework is applied to the remittance provider. In this paper, “informal” is defined as a provider functioning without regulation or oversight of financial supervisors for its remittance services. Therefore, a “formal” provider is one regulated and overseen by competent government agencies for its remittance services. In this paper, it is important to keep in mind that remittance providers who are registered or licensed under a regulatory regime become part of the formal sector.

In countries that have put in place a regime to regulate the remittance sector, providers that over time fail to be registered or licensed, would be illegal providers. In countries that have not yet issued regulations for remittance providers (i.e., no registration or

\textsuperscript{122} IMF (2005)

\textsuperscript{123} According to Passel (2006), the Current Population Survey by the Pew Hispanic Center shows that there were 11.1 million unauthorized migrants in the United States in March 2006. The Center developed an estimate of 11.5 to 12 million for the unauthorized population as of March 2006.

\textsuperscript{124} A more detailed description of the background, workings, and settlement methods of informal remittance systems is provided in El Qorchi et al (2003) and will not be further elaborated here.
licensing requirements or a supervisory structure), it seems appropriate to refer to a regulated formal sector and an unregulated informal sector, where the informal sector would not necessarily be deemed illegal.

Informal providers may interact with the banking (formal) sector for some aspects of their activities. For example, informal providers may utilize the payments mechanism of banks for settlements, but they also settle balances outside the banking system, for instance through other money transfer operators, trade transactions, and/or cash couriers.

Because formality usually entails observance of specific operational requirements, formal Remittances Service Providers (RSP) face compliance costs and rigidity in their processes. As opposed to this, informal remittance systems can be attractive to users because of their speed, low cost, convenience, versatility, and potential for anonymity. Accordingly, a major challenge for authorities seeking to strengthen the integrity of remittance systems is to have a suitable regulatory framework to bring the informal remittance providers into the formal arena. Effective regulations should not impede the flows of remittances nor drive remittance systems underground through excessive regulatory requirements.

This chapter is divided in five sections. Section 2 summarizes the multilateral initiatives to enhance remittance flows through regulatory mechanisms. Section 3 addresses competition in remittance services in light of regulatory requirements and access to payment systems. Section 4 focuses on accessibility considerations, reviewing the obstacles for remittances senders and receivers to use all formal channels. Section 5 addresses regulatory measures to ensure security in remittance services and Section 6 proposes policy recommendations and lists areas for further action.

II. Multilateral Initiatives

In January 2004, the Presidents of the Americas in the Declaration of Nuevo León, México, stated: “We recognize that remittances are an important source of capital in many countries of the Hemisphere. We commit to take concrete actions to promote the establishment, as soon as possible, of necessary conditions, in order to achieve the goal of reducing by at least half the regional average cost of these transfers no later than 2008 and report on progress achieved at the next Summit of the Americas in Argentina in 2005. We will adopt, as needed or appropriate, measures such as: the promotion of competition between the providers of these services, the elimination of regulatory obstacles and other restrictive measures that affect the cost of these transfers, as well as the use of new technologies, while maintaining effective financial oversight.”

Furthermore, at their meetings in Boca Raton, Florida in February 2004, the G-7 Finance Ministers and Central Bank Governors included in their general statement the following commitment: “We aim to reduce the impediments that raise the cost of sending remittances”. During the G8 Summit in the US, in June 2004, it was stated that “G8 countries will work with
the World Bank, IMF, and other bodies to improve data on remittance flows and to develop standards for data collection in both sending and receiving countries. G8 countries will also lead an international effort to help reduce the cost of sending remittances. The developmental impact of these flows may be fostered by increasing financial options for the recipients of these flows. The objectives of the G8 programs are:

- Make it easier for people in sending and receiving countries to engage in financial transactions through formal financial systems, including by providing access to financial literacy programs, where appropriate, and by working with the private sector to extend the range and reach of these services.

- Reduce the cost of remittance services through the promotion of competition, the use of innovative payment instruments, and by enhancing access to formal financial systems in sending and receiving countries. In some cases, remittance costs between sending and receiving countries have been reduced by up to 50 percent or more. G8 countries believe that similar reductions of high costs could be realized in the case of other countries.

- Promote better coherence and coordination of international organizations that are working to enhance remittance services and heighten the developmental impact of remittance receipts in developing countries.

- Encourage cooperation between remittance service providers and local financial institutions, including micro-finance entities and credit unions, in ways that strengthen local financial markets and improve access by recipients to financial services.

- Encourage the creation, where appropriate, of market-oriented local development funds and credit unions that give remittance-receiving families more options and incentives for productively investing remittance flows.

- Support dialogue with governments, civil society, and the private sector to address specific infrastructure and regulatory impediments. For example, governments should ensure non-discriminatory access to payment systems for the private sector, consistent with strong supervisory standards, and work together to modernize overall financial infrastructure."

Against this background, the World Bank and the Committee on Payments and Settlement Systems (CPSS) convened, in November 2004, a Task Force to address the needs of international policy coordination for remittance systems. The output from this Task Force forms a basis for the development, regulation and oversight of remittance systems in the future.

Following its mandate, in March 2006 the Task Force produced a report on "General Principles for International Remittances Services"125, describing key features and functions that should be satisfied by remittance systems, providers and financial intermediaries. These principles are intended to be clear and universally applicable international standards, its main

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125 Henceforth referred to as "the General Principles."
focus being to identify the main characteristics of sending and receiving remittances and the related infrastructures with a view to improving them. In this regard, the General Principles cover areas such as transparency and consumer protection, payment system infrastructure, legal and regulatory environment, market structure and competition, and governance and risk management. The Report also identifies what the role of the remittance service providers and authorities should be to achieve the public policy objective of a safe and efficient market for remittance services. The Principles and related roles of the authorities and remittance service providers are summarized in Box 2 below and are discussed in detail throughout the chapter.

In parallel with the finalization of the General Principles, the Bank is developing, together with other international financial institutions (IFIs), a Guidance Note with detailed guidelines and actions for the implementation of the General Principles, as well as practical suggestions on how to organize a stocktaking exercise. Remittance systems in sending and receiving countries will then be assessed against this framework. The methodology will be available in May 2006. The Bank plans to be involved in these assessments together with other development banks, the IMF and authorities of sending and receiving countries.

The Bank, in cooperation with other International Financial Institutions, will also support the implementation of policy recommendations and action points that stem from these assessments. In this regard, any necessary actions will be integrated in the context of the reform of national payment systems, a process in which the Bank has been involved in more than 70 countries over the past 12 years. Through these reforms, many of the preconditions for increasing efficiency in the provision of remittance services have been already created, both through better retail payment systems and by making payment system oversight more effective.

<table>
<thead>
<tr>
<th>Box 2: the General Principles and related roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>The general principles are aimed at the public policy objectives of achieving safe and efficient international remittance services. To this end, the markets for the services should be contestable, transparent, accessible and sound.</td>
</tr>
<tr>
<td><strong>Transparency and consumer protection</strong></td>
</tr>
<tr>
<td>General Principle 1. The market for remittance services should be transparent and have adequate consumer protection.</td>
</tr>
<tr>
<td><strong>Payment system infrastructure</strong></td>
</tr>
<tr>
<td>General Principle 2. Improvements to payment system infrastructure that have the potential to increase the efficiency of remittance services should be encouraged.</td>
</tr>
<tr>
<td><strong>Legal and regulatory environment</strong></td>
</tr>
<tr>
<td>General Principle 3. Remittance services should be supported by a sound, predictable, non-discriminatory and proportionate legal and regulatory framework in relevant jurisdictions.</td>
</tr>
</tbody>
</table>
Market structure and competition

General Principle 4. Competitive market conditions, including appropriate access to domestic payments infrastructures, should be fostered in the remittance industry.

Governance and risk management

General Principle 5. Remittance services should be supported by appropriate governance and risk management practices.

Roles of remittance service providers and public authorities

A. The role of remittance service providers. Remittance service providers should participate actively in the implementation of the General Principles.

B. The role of public authorities. Public authorities should evaluate what action to take to achieve the public policy objectives through implementation of the General Principles.

III. Enhancing Competition

As mentioned before the cost of sending remittances has been traditionally high, with fees of up to 20% depending of the size, type and destination of the transfer.\textsuperscript{126} By some accounts, reducing the cost of remittances to 5\% of the amount remitted would free up more than US$ 1 billion per year for migrants and their relatives.\textsuperscript{127} In turn, the positive effect in the disposable income of poor migrants is deemed to enhance their incentives to send money home.

The high fees charged by RSPs is a major challenge for policy makers and multilateral initiatives aimed at facilitating international migrant remittance flows to developing countries. However, rather than calling for direct regulation of prices, most of these initiatives focus on enhancing competition in the market as a way to create incentives for efficiency and make prices more representative of the costs to the RSPs.

Prices for remittances have decreased in the last few years in some Latin American corridors served by multiple RSPs. A well known example is that of the U.S.-Mexico corridor (see Figure 9.1). In contrast, prices have remained stable or even increased in less competitive corridors. Examples include the corridors between the US and Colombia, Honduras and Guatemala.\textsuperscript{128} This evidence suggests that pricing of remittance services is largely determined by the level of competition faced by operators, and does not necessarily reflect the actual costs of the services.

\textsuperscript{126} Frias (2005)
\textsuperscript{127} Suro and Bendixen (2002)
\textsuperscript{128} Orozco (2004)
In fact, according to the 2006 *Global Economic Prospects*, transaction costs for RSPs are much lower and dissociated from the fees charged to users, and there is room for decrease in both costs and prices. However, the incentives for incumbent RSPs to realize cost savings and reduce prices are limited in smaller corridors where the limited volume of operations represents a natural barrier to entry to new operators. In these cases many of the benefits of competition can be realized provided that there is contestability in the market (see box 3).

**Figure 9.1. Range of prices of remittance services in the U.S.-Mexico corridor, 1999-2005**

(\% of amount sent.)

![Graph showing range of remittance prices in the U.S.-Mexico corridor, 1999-2005.](image)

*Pink dots and upper line represent the maximum price, red dots and middle line represent average price and blue dots and lower line represent minimum price at each period.*
*Source: Procuraduria Federal del Consumidor (PROFECO)*

**Box 3. Enhancing efficiency in low-volume corridors through contestability**

Even in absence of regulatory or infrastructure barriers to entry, competition can be limited by the size of the corridor, as the volume of operations in small remittance corridors may not afford the existence of multiple RSPs. In these cases, many of the benefits of competition can be achieved if there is contestability in the market. A contestable market is one where transparency and absence of barriers to entry create incentives for incumbents to provide high quality services at fair prices, as new entrants could easily start up and reap the market.

Fostering contestability is arguably one of the most important responsibilities of authorities in low-volume corridors. The role of authorities is twofold:

- Eliminate unnecessary regulatory entry requirements to new operators, and
- Strive to ensure appropriate access to domestic payments infrastructures in fair conditions

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129 World Bank (2006a)  
130 Based on a remittance of US$300.
Regulatory barriers to entry

The most common regulatory barriers to entry refer to the process for authorization for new RSPs to set up business. These barriers are higher in countries where remittances originate than in recipient countries, and have helped to enhance and maintain the market position of incumbent RSPs. The legal or regulatory requirements to formalize a new RSP vary by country, and even by state, as in the case of the U.S. (see box 4). These requirements usually include a license to operate or the registration of the business, and the compliance with minimum standards aimed at avoiding illicit use of the system (see section on security issues below). A limited number of countries, including the United States, also impose prudential provisions such as surety bonds and minimum net worth requirements.

Depending on the jurisdiction, the authorization to set up a new RSP could be as simple as registering the new business as a commercial entity, or as complex as obtaining a license to operate (see the corresponding requirements in table 9.1 below). According to the Financial Action Task Force on money laundering (FATF), the main objective of the formalization of RSPs activities through either licensing or registration is to enhance the security in the system by defining basic entry requirements to operators, impose anti-money laundering and combating the financing of terrorism (AML/CFT) requirements and, in some cases, enable the monitoring of money transfer activities.

<table>
<thead>
<tr>
<th>Supervisory requirements:</th>
<th>Registration</th>
<th>Licensing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background checks</td>
<td>To identify providers, no consequences attached</td>
<td>Full fit-and-proper test</td>
</tr>
<tr>
<td>Internal procedures</td>
<td>Basic AML/CFT preventive measures</td>
<td>Detailed business plan, including AML/CFT preventive procedures</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Basic reporting requirements and risk-based inspections</td>
<td>Basic reporting requirements and regular onsite inspections</td>
</tr>
<tr>
<td>Sanctions</td>
<td>Ranging from informal warnings to fines</td>
<td>Ranging from warnings to withdrawal of license</td>
</tr>
<tr>
<td>AML/CFT requirements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer identification</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Record keeping</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Suspicious transactions reporting</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Security and cost:</td>
<td>Cost of setting up new RSPs Lower</td>
<td>Higher</td>
</tr>
<tr>
<td></td>
<td>Integrity of the system Lower</td>
<td>Higher</td>
</tr>
</tbody>
</table>

Source: IMF 2005 and information compiled by authors.

Importantly, the FATF advocates flexibility and consistency in formalization requirements in order to avoid creating excessive hurdles to the flow of remittances and uneven entry conditions to different operators. In turn, adequate and efficient rules are expected to

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[132] IMF 2005
encourage entities currently in the informal sector to come under the regulatory regime. However, in practice formalization requirements are far from being consistent, even within the same country (see Box 1), which demonstrates that they are still not based on objective security considerations, and do not create adequate incentives for the formalization of operators.

According to the FATF, countries should define the adequacy of licensing or registration requirements based on their specific circumstances. Licensing provides the authorities with the power to perform a pre-qualification due diligence on the RSPs’ operational and basic security systems, including those related to AML/CFT considerations. Moreover, a license for a limited period of time could allow the authorities to enforce periodic reviews of RSPs at the time of license renewals.

Registration, on the other hand, poses significantly lower entry barriers to new RSPs and its main objective is to encourage all RSPs to identify themselves and commit to comply with AML / CFT requirements in the course of their operations. However, since registered RSPs are not required upfront to have systems or procedures in place for basic security, authorities are required to set up monitoring mechanisms to ensure compliance throughout RSPs’ on-going operations. In determining whether a licensing or a registration requirement is imposed for new RSPs, authorities must consider that regulatory activities such as surveillance and enforcement of regulation pose significant resource requirements given the number of RSPs that can operate at any given time. Regulatory requirements should thus be set up in a realistic way considering not only the benefits of increased security but also the consequent costs for the authorities.

Since remittance services, by definition, imply operations in multiple jurisdictions, RSPs are subject to different regulatory frameworks at the same time, which increases the complexity and costs of regulatory compliance. The homologation of regulatory requirements for formalization of RSPs has been considered a way to enhance competition by providing certainty and a level playing field to new entrants. While international homologation may be difficult to achieve, authorities should strive to ensure standardization of entry requirements at a national level.

Moreover, in accordance with the General Principles, regulatory requirements to set up a new RSP should be clear, non-discriminatory and commensurate with the type and size of the operations of the RSP. The issue of proportionality of regulation is essential to ensure a fair and competitive market. Over-regulation or unduly high requirements to entry in the remittance market increases costs which are passed over to users through price increases.

Similarly, while regulatory hurdles can deter RSPs from formalizing their operations, they do not necessarily impede the operations of informal RSPs, which can operate without proper authorization. In turn, this can create an environment of unfair competition (where

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133 It is important to consider that regulatory activities such as surveillance and enforcement of regulation pose significant resource requirements for authorities, given the number of RSPs that can operate at any given time. Regulatory requirements should then be set up in a realistic way considering the costs and benefits for the authorities.
informal RSPs can offer lower prices by not being subject to regulatory costs), and where the system is more open to misuse.

Box 4. Regulatory requirements in the United States as barriers to entry

A recent survey of RSPs operating in corridors between the U.S. and different regions showed that the single most important regulatory barrier that they faced to enter the remittance market was obtaining a license to operate, a constraint mentioned by 40 percent of respondents. By the same token, surety bonds required to operate were seen as a constraint by 1 in 4 of these firms (see figure 9.2).

Figure 9.2. Barriers to entry as reported by surveyed RSPs in the U.S.

There is significant lack of consistency in regulatory requirements among different jurisdictions within the United States. Indeed, the minimum amount required by regulation to set up a new RSP (including net worth and bonding) varies drastically across states, from a low US$ 15,000 in Alabama to US$1.5 million in Pennsylvania.

Surety bonds requirements also differ significantly. Moreover, the fact that bonding requirements in many states are fixed irrespectively of the volume of operations of RSPs, creates a cost bias against smaller RSPs and diminishes the prudential merit of this requirement.

There is no evident rationale for these divergences in regulatory requirements across states, as they do not appear to be proportionate to the overall volume of remittances in each state (figure 134).

134 According to Andreassen (2005), around 55% of RSPs surveyed in the U.S. considered that informal competitors are a considerable or major obstacle, versus less than 30% that had the same view regarding formal competitors.
9.4) or each operator. In turn, this fragmented and inconsistent regulation within the United States has acted as a significant constraint to new operators, limiting competition and thus helping to maintain the preponderant situation of incumbent RSPs.

Figure 9.3. Minimum amount required to set up a new RSP (USD$ Thousand)

![Graph showing minimum net worth and minimum bond requirements for setting up a new RSP.]

Source: Ratha and Riedberg (2005)

Figure 9.4. Range in bonding requirements and level of remittances by state

![Graph showing range in bonding requirements and level of remittances by state.]


The role of payment systems in facilitating competition

RSPs require constant access to payment and settlement systems in the course of their operations. The degree of development of those systems and the extent to which new RSPs can access them largely determines the potential for competition in the market. Indeed, “remittance services, except perhaps those that are entirely cash based, depend at some stage on the domestic payment infrastructure for settlement (and sometimes also for transfer of information)”\(^{136}\). Even though from a technological perspective access of new RSPs to existing payment systems should be relatively easy to achieve either directly or indirectly (through a bank), many RSPs face formal restrictions to accessing these systems.

Direct access to national payment systems is normally granted to well capitalized and established banking institutions. Indeed, in a recent survey, De Luna and Martinez (2005) found that 35 out of 40 authorities in different countries were not favorable to opening the clearing and settlement systems to smaller institutions, which are perceived as lacking the required technology platform, and hence would arguably pose a risk to the system.

\(^{135}\) This case study draws on data and conclusions from Andreassen (2006). All figures are taken from the aforementioned document unless otherwise stated.

RSPs can have indirect access to payment and settlement systems through banks. In theory, this should not create unfair competitive disadvantages to RSPs as regulation of payment and settlement systems should ensure that indirect access to RSPs is provided in fair conditions. However, there are concerns that indirect access could be unduly constrained due to competition (when both the stand-alone RSP and the bank provide remittance services), or regulatory concerns.

For non-bank RSPs operating in the U.S., accounts with commercial banks are their only way to access the official payment and settlement systems and hence an essential component in their operations. However, more than 40 percent of RSPs recently surveyed\textsuperscript{137} considered that limited access to the bank settlement system was an obstacle for their ongoing operations. More importantly, 65 percent of respondent RSPs in the same survey reported problems opening and maintaining accounts with U.S. banks. This may be linked to the fact that many banks are concerned that participation in remittance activities could make them subject to heightened regulatory oversight and costs, even though authorities have expressed that this is not the case.\textsuperscript{138}

According to the General Principles, the problem of accessibility to payment systems, as well as the challenges for cross-border settlement can be addressed through bilateral or multilateral efforts linking existing networks in sending and receiving countries (see box 5).

**Box 5. Building cross-border payment systems\textsuperscript{139}**

The safety and efficiency of remittance services can be affected by payment systems in the relevant markets and the way that these systems are accessed and used by RSPs or by banks acting for RSPs. In addition to improvements in the domestic payment infrastructure, the safety and efficiency of cross-border remittances may be further improved by the coordination and/or adoption across the relevant payment systems of, for example, communications standards and payment message formats that facilitate greater interoperability as well as rules, procedures and operating hours that support straight-through processing. It may also be possible to link the relevant domestic retail payment systems of sending and receiving countries, particularly where the domestic payment systems in both countries are well developed and have wide geographical coverage and where remittance volume between the countries is high.

Sometimes such initiatives may be undertaken by the market itself. However, given, first, the diverse nature of the institutions involved and thus the potential for conflicting interests and, second, the uncertainty about the scale of future flows and thus whether investment in the initiative is justified, in many cases the authorities, and in particular central banks, may want to facilitate the consideration of these possibilities. In general, cross-border or cross-system initiatives require a high level of bilateral (or possibly

\textsuperscript{137} Andreassen (2005).
\textsuperscript{138} Bair (2005).
\textsuperscript{139} The text of this box is quoted from the CPSS-WB Consultative Report: General Principles for International Remittance Services, March 2006, pages 16-17
multilateral) cooperation on technical, regulatory and oversight matters and, accordingly, the extensive involvement of central banks, regulators, payment system operators, banks and bankers’ associations and other industry representatives from both jurisdictions. In some cases central banks themselves have established bilateral cross-border links between the payment systems they operate.

There are several other initiatives ongoing to evaluate ways to expand the use of existing international networks and platforms (e.g. the major international card networks, SWIFT) to provide new or improved remittance services. Also particularly important could be international initiatives to standardize the message formats used by individual payment systems and the international banking community generally, since, even without direct links between domestic payment systems, standardized formats could do much to enable banks and other RSPs to process payment instructions without the need for expensive manual intervention.

In Latin America, efforts to develop cross-border payment and settlement systems have been conducted through private or public initiatives with different degrees of success. For example official efforts to link US payments and settlement systems to Mexican banks (FEDAch\textsuperscript{140}) to eliminate costly wire-transfers have failed to raise significant interest from commercial banks largely due to revenue expectations.\textsuperscript{141} Conversely, private efforts to link networks of Credit Unions appear to be successful at attracting new entrants and providing remittances services at a significantly lower cost (see Box 6).

However, these arrangements can create barriers to new competitors if they require exclusivity. This is especially the case when the disbursing RSP has a large network such as those of the post office, telecom companies or large store chains. While exclusivity agreements between private businesses are difficult to prevent, local governments should ensure that public networks are open to different RSPs rather than being limited by exclusivity agreements.

Box 6. Linking credit unions through the International Remittance Network (IRnet)

The IRnet is a platform created by the World Council of Credit Unions (WOCCU), a multinational trade organization, creating a direct link for remittances between credit unions in origin and destination countries worldwide.\textsuperscript{142}

The stated objective of the IRnet is offering lower-price remittance services. Savings to

\textsuperscript{140} The Federal Reserve Bank's Automated Clearing House system for Mexico.
\textsuperscript{141} Exchange rate differentials in operations through the FEDAch facility are kept by the Central Bank. At the same time, many large commercial banks in Mexico can achieve higher profitability in remittances transactions when they use their own internal cross-border systems (as many are subsidiaries of foreign banks) or closed agreements with capturing agents in the U.S.
\textsuperscript{142} The coverage of IRnet includes Latin America, Asia, Africa, Europe and Australia.
users appear significant with a US$1,000 remittance from the US to Mexico costing US$10\textsuperscript{143} versus US$30\textsuperscript{144} for a similar service with a leading Money Transfer Operator (MTO).

Access to IRnet for new participants appears fairly simple and exceptionally affordable, with signup fees between US$300 and US$750 (depending on the size of the credit union) and maximum quarterly fees of US$150. But most importantly, transaction fees are between US$0.25 and US$0.75.

Even though the IRnet is primarily a network for credit unions, it is open to affiliated MTOs (MoneyGram, Travelex and Vigo Remittance Corporation\textsuperscript{145}), which can act as capturing or disbursing agents. An essential element for the development of this service is its accessibility. To this respect, after legal consultation, WOCCU has issued clear guidelines to member Credit Unions in the U.S. aimed at facilitating the access of undocumented migrants to financial services provided by these entities.\textsuperscript{146}

Source: WOCCU website www.woccu.org unless otherwise stated

Payment Systems Development and Oversight

A sound and appropriate legal framework is generally considered the basis for a sound and efficient system of payments, including remittance services. The legal environment should include the following: 1) laws and regulations of broad applicability that address issues such as insolvency and contractual relations between parties; 2) laws and regulations that have specific applicability to payment systems (such as legislation on electronic signature, validation of netting, settlement finality); and 3) the rules, standards and procedures agreed to by the participants of a payment system. The legal infrastructure should also cover other activities carried out by both public and private sector entities. For example, the legislative framework may establish clear responsibilities for the central bank or other regulatory bodies such as oversight of the payments system or the provision of liquidity to participants in these systems. Finally, relevant pieces of legislation that have impact on the soundness of the legal framework on the payments system include: law on transparency and security of payment instruments, terms and conditions; antitrust legislation for the supply of payment services; and legislation on privacy.

While laws are normally the appropriate means to enforce a general objective in the payments field, in some cases regulation by the overseers might be an efficient way to react to a rapidly changing environment. In other cases, specific agreements among participants might be adequate; in this case an appropriate professional assessment of the enforceability of these

\textsuperscript{143} Source: WOCCU (2006)

\textsuperscript{144} Source: Author’s calculation based on ‘Money in minutes’ service from Western Union. This figure does not include the exchange rate implicit fee.

\textsuperscript{145} Vigo Remittance Corporation has been recently acquired by Western Union. The scope of Vigo’s participation on IRnet going forward is not clear.

\textsuperscript{146} The guidelines also clarify that identification requirements to open an account can be met with a foreign government document such as passport or consular identity card (commonly known as \textit{matricula consular}).
arrangements is usually required. Finally, since the payments system typically includes participants incorporated in foreign jurisdictions or, the payments system might operate with multiple currencies or across borders, in some cases it may be necessary to address issues associated with foreign jurisdictions.

The oversight role of the central bank is currently at the heart of the international debate and the function is emerging as key in central bank activity. Direct involvement of the central bank in managing clearing and settlement systems has been, in all countries, the first step to governing the overall structure and operation of a country’s payments system and ensuring that the desire to limit systemic risk especially in the area of large-value payment systems is adequately taken into account. In many cases, this role stems from the need to ensure a widespread adoption of the more advanced technology in the fund transfer mechanisms and to avoid possible discriminations in the access to payment services. In all cases, in order to pursue the public interest in the payments system, central banks should ensure that the systems they operate comply with the principles and guidelines they establish, and as overseers, ensure the (financial and operational) reliability and efficiency of the clearing and settlement systems they do not operate. The oversight role of the central bank is more likely to emerge in its relevance when the payments reform is complete and the central bank will be called to ensure a proper monitoring of the reliability and efficiency of the domestic system on an on-going basis.

In recent years, in an increasing number of countries, payments system oversight has been explicitly entrusted to central banks by law (see Box 7). Specifying the objectives in relevant legislation may be the most direct way for providing a well-founded legal basis for the central bank to implement its policies and make it accountable in pursuing its goal and mandate in the payments system. For countries facing the implementation of reforms in the payments system, it is of utmost importance for the central bank to have a well-founded legal framework that clearly defines its payments system role and objectives.

In May 2005 the CPSS published a report totally devoted to payment system oversight in G10 countries. Among its main conclusions, this report stated that effective cooperation among market participants, between regulators and market participants and among regulators is essential for the development of a sound and efficient payments system. On one hand, the use of payment instruments generates significant externalities on the demand side, since the usefulness of an instrument is strictly linked to the degree of its acceptance and use for transaction purposes ("network economies"). Consequently, widespread use of new payment instruments and services relies heavily on public confidence in them. On the other hand, within the payments system, the supply of services can be affected by coordination failures due to the existence of conflicts of interests (and information costs) as well as the intermediaries’ unwillingness to cooperate. This can lead to “sub-optimal” equilibria in the organizational arrangements as to the system’s reliability and efficiency. One of the main roles of the payments system overseer is therefore that of making up for coordination failures in the market for payment services.

147 Recent examples are the focus on central bank’s responsibilities in the CPSS Core Principles report and the BIS/IOSCO recommendations for securities settlement systems and the paper on Payments system oversight of the Bank of England. See also Bossone B. and Cirasino M., (2001), “The oversight of the payments system – A framework for the development and governance of payment systems in emerging economies”, Western Hemisphere Payments and Securities Clearance and Settlement Initiative Research Series, CEMLA-World Bank, Mexico City.

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Box 7. Scope of the Oversight Function

As for the scope of the oversight function, at the international level there is consensus on the fact that systems posing systemic risks should fall under the direct control of the overseer. Typical examples of these systems are those that handle transactions of a high value at both the individual and aggregate level. For example, the CPSS Task Force on Core Principles identified the main responsibilities of the central bank in applying the core principles for systemically important payment systems. However, a broader scope including retail payment systems is common in many countries, especially developing ones.

"Central banks have different roles in retail payments, including remittance services, depending on their responsibilities, policies and powers. It may be desirable that central banks monitor developments in the market for remittances to assess their significance for safety and efficiency. In some cases, central banks' responsibilities may also make it appropriate for them to oversee certain remittance services. To the extent that central banks provide payment services, they may be able, where appropriate, to enhance these services to support the smooth functioning of international remittance services. Examples might include the development of new services that support cross-border payments or enhancing existing services to make them more useful for supporting cross-border payments. The central bank should cooperate with other public authorities to address significant policy issues arising from remittance market structures and performance. Central banks may wish to enter into discussions with the private sector and other central banks to facilitate the achievement of public policy objectives regarding remittance services and to foster international cooperation."  

Cooperation problems may be especially relevant within inter-bank clearing and settlement systems. In fact, in these systems the risk profiles – both at the system level and at the level of the individual intermediary – may not be fully assessed by participants. In addition, the concern with having to support less reliable intermediaries may lead larger participants to discriminate against smaller ones, even when these are technically eligible to participate in the system. Finally the payment system industry also depends on agreements between producers to ensure that different components of the system are compatible. Most recently, the emergence of new types of non-bank intermediaries and payment instruments has strengthened the need for a comprehensive level of cooperation in the payments system.

With regard to the cooperation among regulators, the safety and efficiency objectives of payment and securities settlement systems may be pursued by a variety of public sector authorities, in addition to the central bank and the securities commission. Examples of these regulators include: legislative authorities, ministries of finance and competition authorities. There are also complementary relationships between oversight, bank supervision and market surveillance. Appropriate cooperation among supervisors can be achieved in a variety of ways, for example, exchanges of views and information between relevant authorities may be conducted.

by holding regular or ad hoc meetings. Agreements on the sharing of information may be useful for such exchanges.

IV. Transparency in the provision of remittance services

In order to ensure that users can make informed decisions and have the ability to choose their best service option, the elimination of unnecessary barriers to entry for RSPs, and the development of an efficient and fair payment system, must be complemented by measures directed at guaranteeing transparency in the remittances market, together with accessibility to formal RSPs (see section 5). As discussed below, this is a responsibility for both the authorities and service providers.

The role of service providers

Lack of transparency in the remittance markets has been constantly highlighted as a significant problem. Remittance senders are often unaware of the different direct and indirect costs and fees charged by RSPs and therefore ignore the total price of their remittance transaction until the money is delivered to their relatives. Moreover, many senders are unaware that there are costs in addition to the initial fee they are charged. In a recent survey of remittance senders, more than half of the respondents mentioned that the sums delivered to their relatives were lower than they expected, but they did not know why (figure 9.5). Only a small proportion of respondents identified exchange rate differentials as an additional cost in their transaction.

The calculation of the total price of a remittance services is complex and requires the collection of various explicit and implicit components (see box 8). The components of the price of remittances include fees, exchange rate differentials and other less transparent implicit costs such as float and fees charged by disbursing agents. Even in presence of many different options for remittance services, users may find it very difficult and costly to calculate the total cost for various competing services. Accordingly, the choice of provider may not necessarily be the best or the least costly for the users’ needs, and is likely driven by the marketing tactics of RSPs. The problem of transparency is exacerbated when a given RSP offers various remittance services with similar features but significantly different prices (see box 9).

According to the General Principles, RSPs should disclose the total price of their remittance services, the conditions and the characteristics of the service in a way that is clear and easy to understand by their common users. Arguably, the way in which this information is presented should be standardized, in order to facilitate the comparison across different RSPs. However, the General Principles do not call for direct regulation of providers regarding disclosure of price information. Rather they suggest that other mechanisms such as self-regulatory efforts or definition of best practices at an industry level may prove more efficient as ways to enhance transparency.

149 Suro and Bendixen (2002).
Figure 9.5. Perceptions on why the total cost of remittance is higher than the flat commissions paid by senders

![Bar chart showing perceptions on why the total cost of remittance is higher than the flat commissions paid by senders.]

Source: Suro and Bedixen (2002).

Box 8. The calculation of the total price of remittances

Direct fees are the most explicit component of the price and are charged on a transaction basis. Frequently these are flat fees with little or no variation regardless of the amount of the transaction, which works in detriment of smaller remittances as it can represent a large percentage of the money sent (figure 9.6).

Figure 9.6. Fees as percentage of the money sent - Illinois to El Salvador (March 2006).

![Bar chart showing fees as percentage of the money sent.]

Source: Author’s calculation based on information from RSP.

Exchange rate differential represent a second important component of remittances costs. RSPs usually obtain additional revenues from the differential between the exchange rate in the market and the rate set by the RSP for disbursement of the remittance in local currency. It is often the case that the RSP with the lowest fees charges a high exchange rate differential.

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150 Based on the service ‘Money in Minutes’ from Illinois to El Salvador. March 31st 2006.
rate differential (see figure 9.7). Given the fact that many users are not aware of this additional cost, advertisement of fees by RSPs provides incomplete information and can be misleading.

**Figure 9.7. Fees and exchange rate costs.**

![Bar chart showing fees and exchange rate costs for different remittance services.](chart.png)

Source: Author's calculations based on data from PROFECO and Oanda Currency Exchange.

Float. RSPs can also make revenues by holding the remittance funds for a period longer than needed and investing them in overnight transactions. Accordingly, the speed of the service is also a factor determining the overall cost of the remittance.

Additional fees may be charged by at disbursement, especially when this is done by agents rather than through branches of the capturing RSP.

### Box 9. Money in minutes or next day

Western Union is the largest RSP in the US – Mexico corridor, with the largest market share. In this corridor Western Union offers six different remittance services, which are mainly differentiated by the speed of the service, and the disbursing agent locations. The information on total pricing (including fees and the exchange rate differential) of only one of the six types of services is publicly available (through the internet).

Information on total pricing can be disclosed on an ad-hoc basis to users by capturing agents. However, comparative price of the same transaction under different types of services are not directly provided. The total price of the service is usually disclosed to the users in the receipt of the transaction, issued after the operation has been processed.

As shown in table 9.2 below, immediate availability of the remittance at destination is priced almost 60% higher than next-day service. Considering that the same capturing and disbursing agents (and presumably same network and infrastructure) are used in both

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151 Based on a US$300 remittance from New York to Mexico calculated with data as of March 6 2006. The exchange rate cost was calculated using the differential between the exchange rate applied by each RSP and the average interbank exchange rate of the same date (MXP 10.5958 per USDS1).
cases, it is not clear that the incremental costs incurred by the RSP for immediate delivery of remittance can justify the high price differential.

It is frequently the case that users cannot easily differentiate among the different services offered by a given RSP or do not know that cheaper options are also provided by the same operator.

<table>
<thead>
<tr>
<th>Service</th>
<th>Speed</th>
<th>Disbursing agent</th>
<th>Total price of remittance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinero en minutos</td>
<td>Immediate</td>
<td>Partner banks, stores,</td>
<td>$13.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telecom153</td>
<td></td>
</tr>
<tr>
<td>Dinero dia siguiente</td>
<td>Next day</td>
<td>Partner banks, stores,</td>
<td>$8.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telecom</td>
<td></td>
</tr>
<tr>
<td>Dinero a domicilio</td>
<td>3 – 7 days</td>
<td>Home delivery</td>
<td>NA depends on location of recipient</td>
</tr>
<tr>
<td>Giro Paisano</td>
<td>Immediate</td>
<td>Telecom</td>
<td>$10.6</td>
</tr>
<tr>
<td>Giro Telegrafico</td>
<td>Next day</td>
<td>Telecom</td>
<td>$8.3</td>
</tr>
<tr>
<td>Giro Telegrafico con Aviso</td>
<td>Next day</td>
<td>Telecom (includes a home-delivered telegram notification)</td>
<td>$15.5</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on information from Western Union website and capturing agent.

The role of authorities in enhancing transparency in the market

Even in among the most competitive corridors, there is still a wide divergence in pricing of services. Figure 9.8 below shows the range of prices for remittances within the same corridor and similar conditions.154 The wide divergence observed (with the most expensive service costing 235% more than the cheapest) can largely be attributed to lack of transparency.155

Senders are often unaware of the prices that other providers would charge for the same type of service156, and this is due to several reasons. First, it is difficult and costly for users to collect the relevant information to make a complete assessment of costs. Relevant information is difficult to obtain and is frequently provided only in English. Second, frequently there are costs such as exchange rate differentials and fees at disbursing agent that cannot be quantified until after the transaction has been made. Lastly, total prices for remittance services change frequently. An informed choice of RSP would require a continuous monitoring of the different providers.

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152 Includes fees, commissions and exchange rates differential.
153 Telecomm is the state-owned telegraph service, still widely used in Mexico.
154 Although the services vary in terms of the speed of the service and additional accessory features the basic services are similar.
155 Given the fact that all the RSPs listed in this figure are MTOs, accessibility restrictions are equally low in all cases.
156 A survey of remittance senders conducted by PROFECO, the consumer protection agency in Mexico, found that 61 percent of respondents did not know how much they would be charged by a different provider for the same remittance transaction. PROFECO 1998
The role of the authorities is thus to actively facilitate transparency through collection and publication of comparative prices and conditions of service among different RSPs. These efforts can be complemented by the provision of basic financial literacy to users in order to foster awareness of the different service options available to them. At the present time, there are many official efforts in this direction in recipient countries (see Box 10). However, transparency in origin countries is likely to have a higher impact as it is senders who ultimately decide on the choice of service provider.

As per regulatory considerations, it is important to note that the General Principles suggested that a 'name-and-shame' approach through the abovementioned publication of comparative prices would create public awareness and consequently put pressure on RSPs to lower their prices. This would be an alternative mechanism to direct intervention in the market to enforce transparency.

Box 10. Official efforts for transparency in the US – Mexico remittance market

In 1998 PROFECO, the consumer protection agency in Mexico, created a unilateral program to increase transparency in the remittance corridor from the U.S. Although the program initially relied on Mexican Consulates in the U.S. to collect the information on transaction costs, many RSPs eventually requested participating actively by providing the information themselves. At the present time, PROFECO monitors and reports on a weekly basis comparative statistics of the prices charged by 24 different RSPs. Even though the program has expanded geographically over time, it currently monitors prices in only the nine cities with the largest concentration of Mexican migrants. Since RSPs’ prices vary by state in the U.S., there may be significant differences between the states monitored and those not covered by the program.
Both commissions and exchange rate differentials have indeed decreased significantly in the states where this program operates. At the same time, price differential across different origin states have also decreased (see figure 9.9 below). However, several other factors may have also supported this improvement. A significant constraint to the program is the limited dissemination of the information collected. At the present time, the main dissemination channels are postings in Mexican Consulates, a dedicated information hotline (within Mexico), and PROFECO’s internet website. In this respect, diffusion of this information, and overall transparency in the market could be further enhanced by the participation of a counterpart in the U.S. such as the Bureau of Consumer Protection.

**Figure 9.9. Total price of remitting US$300 from various cities in the U.S. to Mexico 1998 – 2005 (average of all RSPs monitored).**

Source: PROFECO

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**V. Accessibility to formal remittance services**

As mentioned in the previous sections, the existence of numerous providers of remittance services in a given corridor does not ensure the efficiency of the market. The wide divergences in prices still observed among RSPs can be explained in part by lack of transparency. However, these divergences can also be caused by differentiated access to specific service providers, at both the countries of origin and destination of the transaction.

Over the past two decades, the market has evolved from one dominated by labor-intensive physical transmission and courier services to a market dominated by cash-to-cash wire transfers through MTOs (see figure 9.10). The entrance of financial institutions into the remittances market has made available more cost-efficient transactions such as account-to-cash and account-to-account remittances, which are slowly gaining market share.
Informal providers and courier services

MTOs

Financial Institution with disbursing agent.

Financial Institutions only

People traveling

Bank

Mail

Credit Union

However, constraints to accessibility appear to be inversely related to the level of efficiency of new channels. For example, while remittance services can be cheapest through bank services (see table 9.3), a large percentage of migrants do not have access to banking facilities.158

Table 9.3. Types of remittance service and accessibility considerations

<table>
<thead>
<tr>
<th>Type of service</th>
<th>Provider</th>
<th>Price</th>
<th>Accessibility constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical delivery</td>
<td>Informal providers and courier services</td>
<td>Difficult to monitor and quantify due to informal nature of the service.</td>
<td>Lowest: no identification or reporting requirements and arguably few constraints to amounts.</td>
</tr>
<tr>
<td>Cash-to-cash</td>
<td>MTOs</td>
<td>Usually highest among formal RSPs</td>
<td>Low: identification usually required only for transactions above US$300. Foreign IDs accepted</td>
</tr>
<tr>
<td>Account-to-cash</td>
<td>Financial Institution with disbursing agent.</td>
<td>Usually cheaper than many MTOs</td>
<td>High: Requires that sender has a bank account</td>
</tr>
<tr>
<td>Account-to-account</td>
<td>Financial Institutions only</td>
<td>Cheapest. Can be nil due to cross-selling of other financial services</td>
<td>Highest: Requires that both sender and recipient have bank accounts</td>
</tr>
</tbody>
</table>

Historically, migrants’ access to bank accounts in the U.S. has been constrained by founded and unfounded considerations, of which the most important one related to the legal status of migrants (figure 9.11). Other constraining factors appear to be related to expectations of costs, level of income and, to a lesser extent, distrust in financial institutions. In these cases, lack of information, rather than regulation may be the sources of constraints. These factors are analyzed below.

158 A survey of remittance senders in 2002 showed that only in 26% of the cases both sender and recipient of the remittance had a bank account.

Source: Multilateral Investment Fund, IDB
Regulatory constraints to accessibility at the country of origin\textsuperscript{159}

The regulation in the U.S. requires that, for security purposes, financial institutions verify the identity of applicants when opening up new bank accounts. While federal regulation does not expressly forbid the provision of financial services to undocumented applicants, this issue is far from being clear, creating concerns among both financial institutions and a large segment of prospective clients.\textsuperscript{160}

To date, many financial institutions provide financial services only to individuals that can prove their legal residence in the U.S. (see table 9.4 below). This appears to be largely due to seemingly unfounded concerns among many banks that provision of financial services to undocumented migrants or specific ethnic groups could subject them to more stringent regulatory oversight, with the consequent increased costs and loss of efficiency (Bair, 2005).

There have been significant efforts both from the private and the public sector to reduce accessibility constraints to migrants. According to Orozco (2005), the Treasury Department opened access to bank accounts to undocumented individuals of Mexican nationality.\textsuperscript{161} In 2002, the Treasury Department advised Congress that, under the terms of the regulation to ensure security in the system (USA PATRIOT Act), an official identification issued by the Mexican government (consular identity card) can be used as a valid form of identification to open an account with a financial institution. Authorities from other recipient countries should seek to implement similar programs to provide their nationals with a form of identification that facilitates access to banks in the U.S.

\textsuperscript{159} This section focuses on the situation in the U.S., as the country of origin of most of the remittances to Latin America.
\textsuperscript{160} According to some estimates (Lowell and Suro, 2002), at least two-fifths of the adult Latino immigrant population is made up of individuals not authorized to be in the country.
\textsuperscript{161} It is not clear whether identifications of migrants of other nationalities would have similar treatment.
Table 9.4. Requirements to open a bank account in the U.S. (March 2006)

<table>
<thead>
<tr>
<th>Bank</th>
<th>Requirements to open an account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citibank</td>
<td>• Be a U.S. citizen or Resident Alien</td>
</tr>
<tr>
<td></td>
<td>• Have a U.S. address</td>
</tr>
<tr>
<td></td>
<td>• Have a Social Security Number or Tax ID</td>
</tr>
<tr>
<td>Bank of America</td>
<td>• Social Security numbers</td>
</tr>
<tr>
<td></td>
<td>• Home addresses for the last twelve months</td>
</tr>
<tr>
<td></td>
<td>• Driver's license, US Passport or State ID numbers</td>
</tr>
<tr>
<td></td>
<td>• Credit card or bank account number for funding your new account</td>
</tr>
<tr>
<td></td>
<td>• Current email address</td>
</tr>
<tr>
<td>US Bank</td>
<td>• Social Security Number</td>
</tr>
<tr>
<td></td>
<td>• Driver's License, State ID or Military ID number and expiration date.</td>
</tr>
<tr>
<td></td>
<td>• Email address</td>
</tr>
<tr>
<td>Harris Bank</td>
<td>• Social Security number</td>
</tr>
<tr>
<td></td>
<td>• Employment information (company name, address and phone number)</td>
</tr>
<tr>
<td></td>
<td>• Driver's license or other ID numbers</td>
</tr>
</tbody>
</table>

Source: Information provided in the website of each institution. Compiled by author.

Financial institutions are increasingly providing services to undocumented migrants in a simplified way, for example:

- The World Council of Credit Unions (WOCCU) has issued a recommendations document\(^{162}\) to member Credit Unions in the U.S. clarifying that a) official documents issued by foreign governments are acceptable forms of identification for opening up an account, and b) federal regulation does not prohibit providing services to undocumented individuals. However, it highlights that state-specific regulations may do so.
- The Coalicion Internacional de Mexicanos en el Extranjero (CIME) has reached agreements with various banks in Illinois in order to reduce requirements for opening up new bank accounts and to provide these services to undocumented migrants. However, this initiative is limited to banks in Chicago and has recently been expanded to Indianapolis.

Non-regulatory determinants of accessibility

From the demand side, beside the constraints posed by regulation and banks’ policies, there appears to be a significant problem of information as many undocumented migrants have the perception that banks might share their information with immigration authorities, which would expose them to deportation. By the same token, many migrants do not trust financial institutions in general, and many consider that financial services are inadequate for them. Many of these reservations appear to be based more on word-of-mouth than on first-hand negative experience with banks.

\(^{162}\) WOCCU, “How to serve undocumented individuals”, World Council of Credit Unions, Inc., Washington D.C.
The cost of the financial services can be significant, and is frequently considered too burdensome both by clients and by some market practitioners. Banks typically charge transaction fees and commissions for account management to users that have an average balance below certain threshold (frequently set above US$1,000), which is above the means of many migrants given their low income. In a recent survey among migrants that use remittance services (MIF 2004) only 38% of respondents that have a yearly income of below US$ 30,000 have a bank account. This is particularly noteworthy considering that the majority of migrants seem to be concentrated in that income bracket.

Accessibility issues in receiving countries

The quality of the financial services infrastructure in recipient countries is critical to ensure security and efficiency of the service, and hence create incentives for senders to use more efficient channels. Even though migrants are wary of high fees, their choice of channel for remittances is significantly influenced by the convenience, security and reliability at the receiving end.

Accessibility can be improved by enabling more financial institutions to participate in remittances. In particular, savings and loans, credit unions and microfinance companies may be well positioned to act as disbursing agents, as their networks may be closer to the usual recipients of remittances than that of large commercial banks. In this sense, authorities at recipient countries should ensure that there are no unduly regulatory constraints to the participation of these entities.

VI. Security Issues

Remittance channels can and have been used for illicit purposes, which include money laundering, as well as fraud and financing of terrorism activities. Any funds transfer system can be misused for money laundering or terrorist financing. As put in an IMF report, "like their counterparts in the traditional financial sector, operators of remittance systems could be misled

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163 Suro and Bendixen (2002).
164 According to recent remarks by Citibank officials, the process of sending remittances through commercial banks is "expensive, challenging and time consuming" both for the customer and the bank, [largely due to regulatory requirements]. From Balancing Competition and Regulation in the Remittance Market, Citibank, Bob Annibale, IDB International Forum on Remittances 2005
165 Remittance providers have been associated with facilitating tax evasion, capital flight, circumventing excise requirements and smuggling. See El Qorchi et al (2003)
166 Examples of remittances being used to fund terrorism, civil wars and liberation struggles include remittances being used to acquire arms for guerrilla in Somalia, remittances originated in Sweden to fund the Free Aceh Movement, in Canada for the Liberation Tigers of Tamil Eelam and from the U.K. for the Kashmiri cause. Based on Kapur, Davesh, 2004, "Remittances: The New Development Mantra?", G-24 Discussion Paper No.29, UN Conference on Trade and Development, Geneva, Switzerland. And Chee Sung Lee and Maud Boekkerink "Two current issues facing developing countries".
by persons in terms of both the nature and intended purpose of the transaction as well as the identity of the persons sending and receiving the funds in question.\textsuperscript{167}

The risk of misuse of remittance channels is highest among informal remittance providers that are completely unknown to the regulatory or supervisory bodies. As argued by the IMF, informal providers may not fully understand the consequences of not undertaking adequate due diligences regarding their customers' identities, the nature of their businesses, and their possible engagement in illicit activities. Thus, "while some customers may value anonymity, this is a key risk for ML/FT. It is believed that the risk of misuse of remittance systems would be reduced if transfers were channeled through remittance systems that are subject to regulations and monitoring by national authorities."\textsuperscript{168}

Accordingly, the FATF considers that security in the system can be enhanced by a combined approach including:

- Efforts by national authorities to encourage and enable the use of formal systems (such as banks) by lowering the costs and increasing access to these systems to all users as discussed in the previous section, and

- Putting in place a regulatory framework which includes licensing or registration together with AML/CFT requirements for money transfer providers. Moreover, the FATF recommends that those requirements should be the same as those followed by banks and other financial institutions.

The main AML / CFT regulations are the Bank Secrecy Act\textsuperscript{169}, the Patriot Act\textsuperscript{170} and directives from the Office of Foreign Assets Control (OFAC) in the U.S (see box 11).

\textbf{Box 11. AML and CFT regulations}

\textit{FATF recommendations.}\textsuperscript{171}


Recommendation 5: Financial institutions should undertake customer due diligence measures, including identifying and verifying the identity of their customers, when carrying out occasional transactions that are wire transfers.

Recommendation 7: Financial institutions should, in relation to cross-border

\textsuperscript{167} IMF (2005)
\textsuperscript{168} IMF (2005)
\textsuperscript{169} Regulation included in 31 USC Sections 5311-5330 and 12USC Sections 1818, 1829 and 1951 - 1959
\textsuperscript{170} Regulation included in Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001.
\textsuperscript{171} Extract from World Bank (2006a)
correspondent banking and other similar relationships, in addition to performing normal due diligence measures: (a) Gather sufficient information about a respondent institution to understand fully the nature of the respondent's business and to determine from publicly available information the reputation of the institution and the quality of supervision, including whether it has been subject to a money laundering or terrorist financing investigation or regulatory action. (b) Assess the respondent institution's anti-money laundering and terrorist financing controls. (c) Obtain approval from senior management before establishing new correspondent relationships. (d) Document the respective responsibilities of each institution. (e) With respect to “payable-through accounts”, be satisfied that the respondent bank has verified the identity of and performed on-going due diligence on the customers having direct access to accounts of the correspondent and that it is able to provide relevant customer identification data upon request to the correspondent bank.

Recommendation 8: Financial institutions should pay special attention to any money laundering threats that may arise from new or developing technologies that might favor anonymity and take measures, if needed, to prevent their use in money laundering schemes. In particular, financial institutions should have policies and procedures in place to address any specific risks associated with non-face to face business relationships or transactions.

Recommendation 23: ... Other financial institutions should be licensed or registered and appropriately regulated, and subject to supervision or oversight for anti-money laundering purposes, having regard to the risk of money laundering or terrorist financing in that sector. At a minimum, businesses providing a service of money or value transfer, or of money or currency changing should be licensed or registered, and subject to effective systems for monitoring and ensuring compliance with national requirements to combat money laundering and terrorist financing.

Extracts from Special recommendations on terrorist financing, FATF, revised 22 October 2004.

VI. Alternative remittance: Each country should take measures to ensure that persons or legal entities, including agents, that provide a service for the transmission of money or value, including transmission through an informal money or value transfer system or network, should be licensed or registered and subject to all the FATF Recommendations that apply to banks and non-bank financial institutions. Each country should ensure that persons or legal entities that carry out this service illegally are subject to administrative, civil or criminal sanctions.

VII. Wire transfers: Countries should take measures to require financial institutions, including money remitters, to include accurate and meaningful originator information (name, address and account number) on funds transfers and related messages that are sent, and the information should remain with the transfer or related message through the payment chain.

172 This section draws from MoneyGram (2006a)
Countries should take measures to ensure that financial institutions, including money remitters, conduct enhanced scrutiny of and monitor for suspicious activity funds transfers which do not contain complete originator information (name, address and account number).

The Patriot Act

The Patriot Act required that all RSPs adopt a written anti-money laundering program that is designed to ensure monitoring and reporting of suspicious transactions. This program must include:

- Internal policies, procedures and controls to verify customers identification, file reports, keeping records and respond to law enforcement requests
- Designation of a compliance officer responsible for ensuring that procedures are followed
- Provision of on-going training to employees on compliance to procedures
- Independent review of the anti-money laundering program

Record keeping requirements:
- Transactions below US$1,000 require presentation of identification of sender that includes name and address (identification cards issued by a foreign government can be accepted). Identification of the receiver is not required.
- Transactions (both send and receive) above US$3,000 require collecting information on identification, address and occupation of sender and receiver.
- Transactions above US$10,000 require filing of a standard Currency Transaction Report (CTR). CTRs must be filed with the Internal Revenue Service.
- Records of transactions above US$3,000 must be retained for five years.

Similarly, RSPs must report 'suspicious activity' such as structuring (splitting remittances in small transactions to avoid reporting) through a Suspicious Activity Report. However there are no clear guidelines as per the definition of 'suspicious', and this is left to the individual agent or operator to identify and report.

Reporting to the Office of Foreign Assets Control (OFAC)

The OFAC is the unit of the U.S. Department of the Treasury in charge of enforcing economic and trade sanctions against targeted foreign countries, terrorists and drug cartels. OFAC issues a list of governments, terrorists, drug traffickers and those engaged in proliferation of weapons of mass destruction. This list is known as Specially Designated Individuals (DSN List).

Any transaction with individuals or entities included in the DSN List is prohibited by OFAC regulation, and businesses are required to identify and freeze assets of organizations or individuals included in the list and report to the Department of Treasury.
Criminal penalties

Non-compliance with the anti-money laundering regulations derived from the Bank Secrecy Act, USA Patriot Act and OFAC can be punished by high fines and prison terms. Businesses can be held criminally liable for the acts of the employees.

Enforcing Regulations

Even if regulations for ensuring adequate security in payments and remittances systems are rightly established, their application at the local level can be challenging, requiring a balance between strict enforcement, proportionality to the risk of misuse and avoidance of disruption caused by unduly burdensome requirements (see Box 12).

According to the General Principles, AML and CFT regulations should be equally applicable to all RSPs irrespectively of their legal form (i.e. financial institutions or commercial companies). The regulatory framework for remittances should thus be defined on a functional, rather than institutional basis so that it can be extended to any RSPs that are not currently under regulatory oversight. As opposed to this, the uneven application of regulatory requirements across RSPs creates both loopholes that can be used for illicit purposes, as well as competitive disadvantages for regulated entities.173

However, this principle is difficult to apply in many countries, where authorities and applicable regulations depend on whether the RSP is a financial institution or just a commercial company. Moreover, regulation is not harmonized throughout Latin America and in many countries appears to be minimal and enforcement limited (Orozco, 2005).

Box 12. The FATF’s Best Practices on regulatory requirements

According to the FATF, the implementation of adequate regulatory requirements should take into consideration the following tasks:

- Supervisors need to have a better understanding of the nature of the remittance business to design a regulatory framework;
- Supervisors should show sufficient flexibility in dealing with remittance providers, but ensure that a regulatory system works effectively;
- Supervisors should have adequate resources and capacity to regulate remittance

173 Non regulated RSPs can offer services at an artificially low price as they are not subject to the considerable regulatory costs incurred by formal competitors.
systems;

- Supervisors need to analyze the flow of remittance funds to detect irregularities and possible misuse of the system;

- Supervisors need to issue clear policies on how to deal with remittance providers that choose not to participate in the regulatory system.

Source: IMF (2005)

The cost of compliance

The cost of compliance with AML / CFT regulations can be very high. It includes the setting up of monitoring and reporting systems, the establishment and enforcement of internal procedures, the constant training of personnel and frequent external audits to the various systems. Moreover, RSPs are subject to reporting requirements with multiple authorities and, in the case of the U.S. also to additional regulation at the state level. Not surprisingly, in a recent survey of RSPs the costs of regulatory compliance have been identified as the third most important expense, after rent and salaries, mentioned by 45 percent of RSPs (figure 9.12).

Figure 9.12. Largest expenses reported by RSPs

![Bar chart showing the largest expenses reported by RSPs]


The FATF advises that countries should ensure that oversight is commensurate with the risk of misuse to avoid unnecessary costs and inefficiency. At the same time, countries should seek to ‘formalize’ RSPs through licensing or registration, as a mechanism to help enforce AML/CFT requirements. In turn, the decision to either license or register RSPs should take into account that the former creates relatively high costs of pre-qualification (due diligence) which could deter new entrants, while registration poses low barriers to entry, but requires sufficient resources for ex-post monitoring by authorities.
Similarly, the General Principles suggest that any regulation of remittances should balance the benefits of increased safety of the system with the potential costs and inefficiencies created. Regulatory costs can translate into higher remittance prices for formal RSPs, they can increase barriers to entry for new formal competitors, and create incentives for the proliferation of informal RSPs. All in all, regulators need to take into account the trade off between increased security and the creation of unnecessary constraints to the flow of bona fide remittances.

VII. Policy Recommendations

*Competition*

- Regulatory requirements for new RSPs should balance the need to maintain security in the system with eliminating unnecessary hurdles to bona fide entrants. Entry requirements must be clear, transparent and uniformly applicable to all entrants of similar characteristics. These requirements should also be proportional to the risk and volume of operations. While homogeneity across countries is a desirable but hard to achieve goal, requirements should at least be homogenized within the same country.

- Unduly regulatory barriers to the use of payment and settlement systems (either directly or indirectly) should be removed. While direct access may not be strictly necessary, indirect access through financial institutions should not translate into competitive disadvantages for RSPs.

- Exclusivity agreements between capturing and disbursing RSPs can limit competition in the market, especially when they involve wide networks. While these may be difficult to prevent when both RSPs are private entities, local authorities at destination countries should maintain public networks – e.g. the postal systems – open to different service providers.

- Authorities in low volume corridors should ensure contestability in their local markets as a way to create incentives for efficiency of incumbent RSPs.

*Transparency*

- Authorities should take an active role in the collection and dissemination of information on comparative prices of remittance services by different providers. This information should be disseminated through adequate channels in a form that is clear and easily understandable. Bilateral efforts should be made so that this information is disseminated both at countries of origin and destination of remittances.

- Many authorities have avoided direct regulation and enforcement of transparency by RSPs. However, the experience in some countries shows that RSPs have found in their best interest to cooperate with official efforts for transparency on a voluntary basis. Similarly, the

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*See Orozco (2005).*
establishment of best practices at the industry level can be encouraged as a form of self-regulation. The price information disclosed by RSPs should be clear, easily understandable, and provided in the languages of the corresponding corridor. This information should also be presented under an industry-wide format to facilitate users' comparisons across RSPs.

Accessibility

- Accessibility to financial services at the country of origin of remittances can be limited by unnecessarily high documentation requirements that affect particularly illegal immigrants.
  - In the cases where this is due to actual regulation, authorities should review the merit and need for such constraints.
  - In other cases this is not a direct regulatory requirement, but appears to be derived from misinterpretation of regulation or unfounded banks' expectations of stronger oversight by regulators if they provide services to undocumented migrants. Authorities should ensure clarity in regulatory requirements and transparency in their oversight processes in order to avoid misinterpretations that can translate into artificial constraints to accessibility.

- Financial services may also be under-utilized by immigrants based on perceptions of high costs or distrust of financial institutions. Financial services such as bank accounts can indeed pose significant transaction costs and administration fees, especially to users that cannot maintain a minimum balance. While it is unlikely that this is an issue that can be addressed by authorities, there is room for the provision of basic financial literacy that can lower mistrust on banks while helping migrants to understand the costs and benefits of using financial institutions for remittances and other services. Joint efforts by authorities and financial institutions should be considered.

- Accessibility to financial services at the country of destination of remittances can be improved by permitting access to remittance services to smaller financial institutions such as credit unions, savings and loans and microfinance companies. Because of their focus, these institutions may be closer to the recipients of remittances than mainstream commercial banks.

Security

- The definition and implementation of regulatory measures to ensure security in the system must be based on authorities' efforts to collect information and fully understand the characteristics of the remittances markets.

- Basic security regulations to avoid criminal misuse of remittance channels should be applicable to all RSPs. Uneven application of these regulations can hamper the security of the system by creating loopholes than can be exploited for illegal purposes. Similarly uneven regulation can create market disruptions through unfair competitive advantages in favor of less-regulated entities. However, the even application of security regulation may pose significant challenges to authorities in countries where the regulatory framework is different.
across RSPs that operate as financial institutions and those that are established as commercial companies.

- Given the fact that compliance with regulatory requirements is costly and can create operational inefficiencies, regulation to ensure security of the system should be proportionate to the risk of misuse and the volume of operations of the RSPs.
REFERENCES


Attanasio, O. and M. Székely (2000): "Saving in Developing Countries: Inequality, Demographics and all that", mimeo, University College London, London.


Banco de la República de Colombia (2004): “Principales Resultados de la Encuesta de Costos de Transacción de Remesas de Trabajadores en Colombia”.


Hanson, G. H. and C. Woodruff (2003): “Emigration and Educational Attainment in Mexico” mimeo, University of California, San Diego, California.


(2005): “World Economic Outlook” International Monetary Fund, Washington, DC.


http://www.oecd.org/document/5/0,2340,en_2825_494553_34063091_1_1_1_1_00.html


