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# Measuring Economic and Social Impacts of Migration in Colombia: New evidence<sup>\*</sup>

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## Abstract

This paper analyses a comprehensive dataset on migration using robust econometric methodologies to assess a range of economic and social impacts of migration on individuals and households left behind. Our findings indicate that there is no significant impact on labour force participation in households with migrants, but remittances do appear to have a negative effect on labour force participation. Migration (either absent or returned) increases total per capita expenditure by nearly US\$35 per month while households that receive remittances increase per capita expenditures by US\$49 per month on average. Expenditures in health and education also increase. However, there is no effect on school attendance, while individuals living in a household with an absent migrant are almost 4 per cent less likely to state that their health is good. Households with migration experience are around 8 per cent less likely to keep their immediate families together, with this effect particularly pronounced in the sub-group of households with return migrants. Our policy recommendations emphasize the importance of family reunification, and issue that deserves more decisive policy actions on the part of the Colombian government.

**Keywords:** International Migration, Remittances, Program Evaluation.

**JEL Codes:** F20, F22, F24

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# 1. Introduction

Although Colombia was not a major sender or recipient of migrants until recently, migration reached unprecedented levels in the late 1990s and since then has become a major social and economic issue. According to various sources of data, around 8 per cent of Colombians live abroad, mostly in the US, Spain and Venezuela. In 2008, international remittances constituted 3 per cent of Colombia's GDP, compared to just 1 per cent in 1998. That this is a relatively recent phenomenon is also illustrated by the fact that 45 per cent of Colombians living in the US in 2000 arrived during the previous decade (according to the US Census).

These trends have generated an increasing interest in the causes and consequences of international migration in Colombia. In this study we focus on the effects of international migration, looking in particular at impacts on household members that stay in Colombia. Although this issue has been previously analysed, the existing research has two limitations. First, surveys have been limited to very specific areas of the country. Second, surveys do not contain sufficient information on the migrant. To overcome these limitations, we carried out our own survey as part of the *Development on the Move* (DOTM) project, an initiative led by the Global Development Network (GDN) and the Institute for Public Policy Research (ippr). The survey is representative of the main 13 metropolitan areas of the country where international migration is concentrated. It asked household members about their own characteristics and those of absent and returned migrants. Importantly, the survey also included questions about the socio-economic characteristics of the household at the moment of departure of the migrant. This allows us to investigate the effects of migration using more robust and non-experimental estimations than previous work (more information about our survey sampling strategy and report methodology can be found in Appendices A and B).

Throughout the paper we define households with migration experience as those in which at least one member of the household, Colombian by birth, left the country within the last 10 years and is still absent out of the country; or that stayed for at least three months in another country and then returned (see Box 1 below). A three month definition of migration differs from the usual definition used in official data sources, which only includes people who moved for a year or more. We feel our definition is more useful as it allows us to capture short-term, irregular and seasonal movement, as well as more permanent emigration. We also differentiate the effects of migration experience from those of remittances: some households may record migration experience and no remittances, and vice versa.

## Box 1: Definitions of migration

- **Migrant:** Someone who has spent three months or more living continuously in a country other than that of their birth.
- **Household:** people presently living together in the same dwelling most of the time, regardless of their legal place of residence, and who share income and expenses.
- **Absent migrant:** A person who was born in the country of our study but who is currently living in another. We only examine people who went to live abroad in the last 10 years in order to try to minimise 'recall errors' when respondents discuss them, so anyone who left more than 10 years ago is not included in this category.
- **Returned migrant:** A person who was born in the country of our study and who lives there now but who at some point has lived in another country for three months or more.

Specifically, we use the DOTM dataset to assess the effects of migration and remittances on a broad set of household outcomes, such as labour participation, total per-capita expenditures,

and expenditures on education, health, and other social goods. We also address the impact of migration and remittances on access to financial services, and pay special attention to the consequences of migration for poverty and inequality. Finally, we investigate whether migration has any gender-specific impacts, and look into the non-monetary dimensions commonly referred as quality of life.

The remainder of the paper is organised as follows. Section 2 gives an historical overview of international migration in Colombia and describes the socio-economic characteristics of migrants, using evidence from the DOTM dataset as well as other sources. Section 3 presents the findings of our impact analysis and offers some interpretations of these results. Section 4 makes some policy recommendations based on our findings and analysis.

## **2. Patterns of migration in Colombia**

This section provides some background information on migration in Colombia, focusing particularly on outwards migration to the US, Spain and Venezuela, which have been the main destination countries for Colombian migrants. Based on various sources of information, including US census data in particular, we also describe some socio-economic features of the average Colombian migrant.

### **2.1 History of Colombian migration**

A recent consensus has been built regarding the number of international Colombian migrants, based on the 2005 Colombian Population Census, the Department of Administrative Security (DAS) and other sources. According to these data, there are 3.3 million Colombians living abroad (approximately 8 per cent of the Colombian population). Unlike other Latin American and Caribbean countries, such as Argentina and Mexico, migration has not played a crucial role in the country's history. Although migratory waves have taken place in the past, they have tended to be relatively small. For example, Guarnizo (2003) and Gamarra (2003) show that the era of violence that took place in the country during the 1950s led to some migration to countries such as Venezuela, the US, Ecuador and Panama.

Examining the causes of migration in the latter half of the twentieth century, Medina and Posso (2009) use the 2000 US Population Census to uncover the year that Colombian and other South American migrants living in the US first arrived there, illustrating that periods of Colombian migration to the United States match those of other South American countries. This suggests that past migration flows were driven to a large extent by migration reform and rules in the US, rather than specific conditions in the sending countries. Gaviria (2004) argues that drug trafficking was another reason why Colombians migrated to the United States between 1975 and 1990 (mainly to New York and Florida).

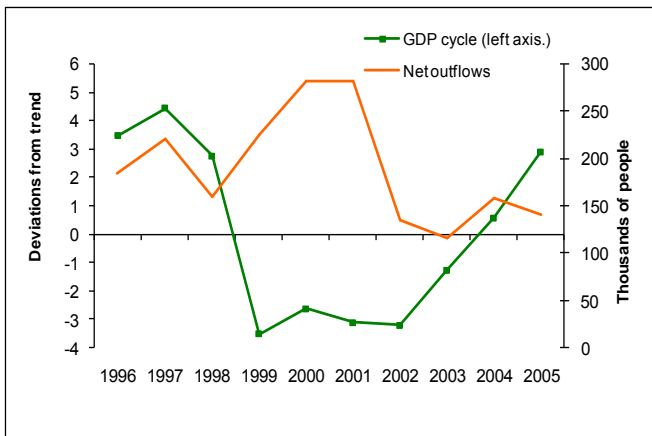
Since the late 1990s Colombia experienced its largest recorded migration wave. According to border control authorities (DAS), almost 2 million Colombians migrated between 1998 and 2008. The determinants of these outflows have been studied, and the dominant viewpoint is that the main cause was the deep economic crisis of 1998-2000, which resulted in unemployment rates reaching an unprecedented 20 per cent.<sup>1</sup> Authors also typically mention the effects of the deterioration of social conditions in the country. Figures 1 and 2 illustrate how the timing of the economic cycle, and the internal conflict conditions, matched that of the net outflows of Colombians in the late 1990s to Spain and the United States (Figures 3a and 3b).

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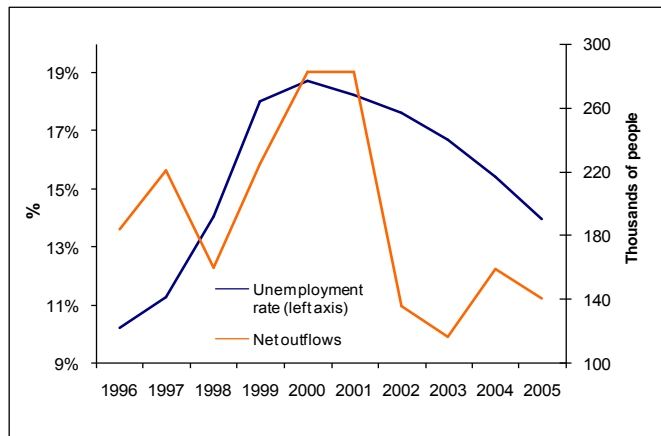
<sup>1</sup> See Solimano (2003), Centro de Estudios Monetarios Latinoamericanos (2007) and Cárdenas and Mejía (2009).

**Figure 1: Economic fluctuations and Colombian migration**

*GDP cycle and Net outflows of migrants*



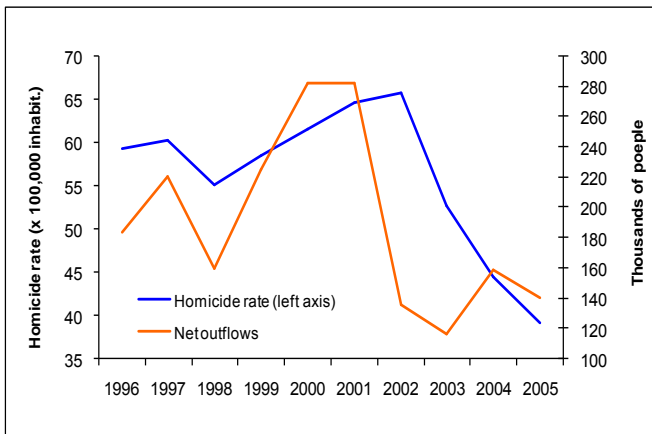
*Unemployment rate and net outflows of migrants*



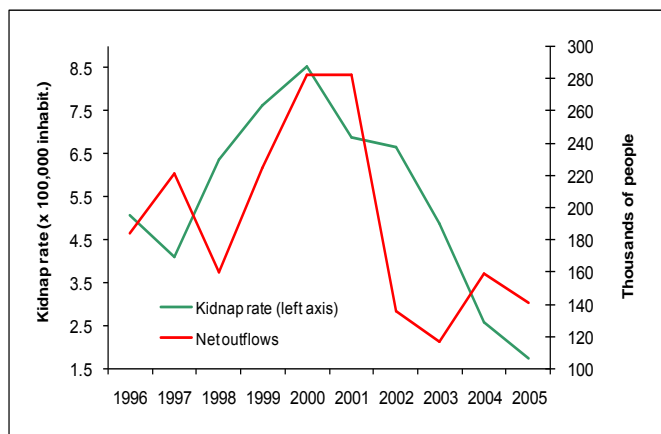
**Source:** Administrative Department of Security (DAS) and Department of National Statistics (DANE)

**Figure 2: Conflict and Colombian migration**

*Homicides and migration*

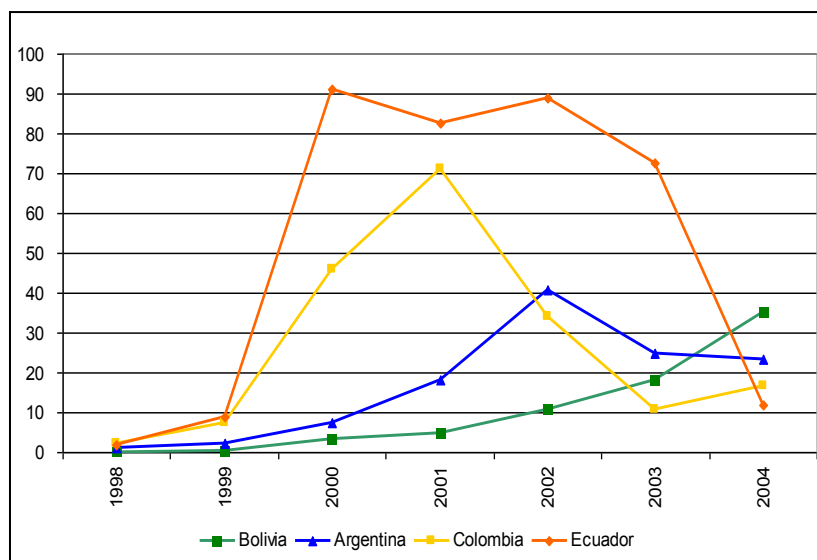


*Kidnappings and migration*



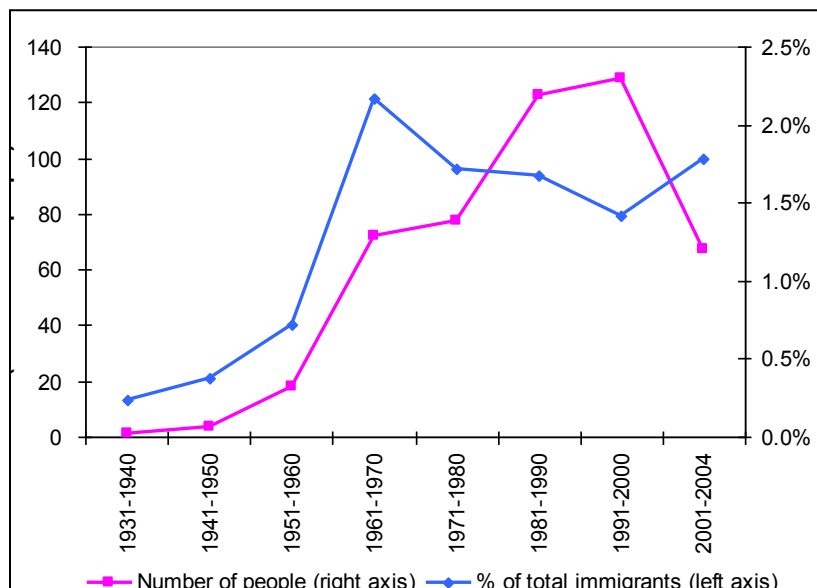
**Source:** Administrative Department of Security (DAS) and National Department of Planning (DNP)

**Figure 3a: Selected South American migration flows to Spain (in thousands of people)**



Source: Instituto Nacional de Estadística de España

**Figure 3b: Colombian migration to the US (in thousands of people)**

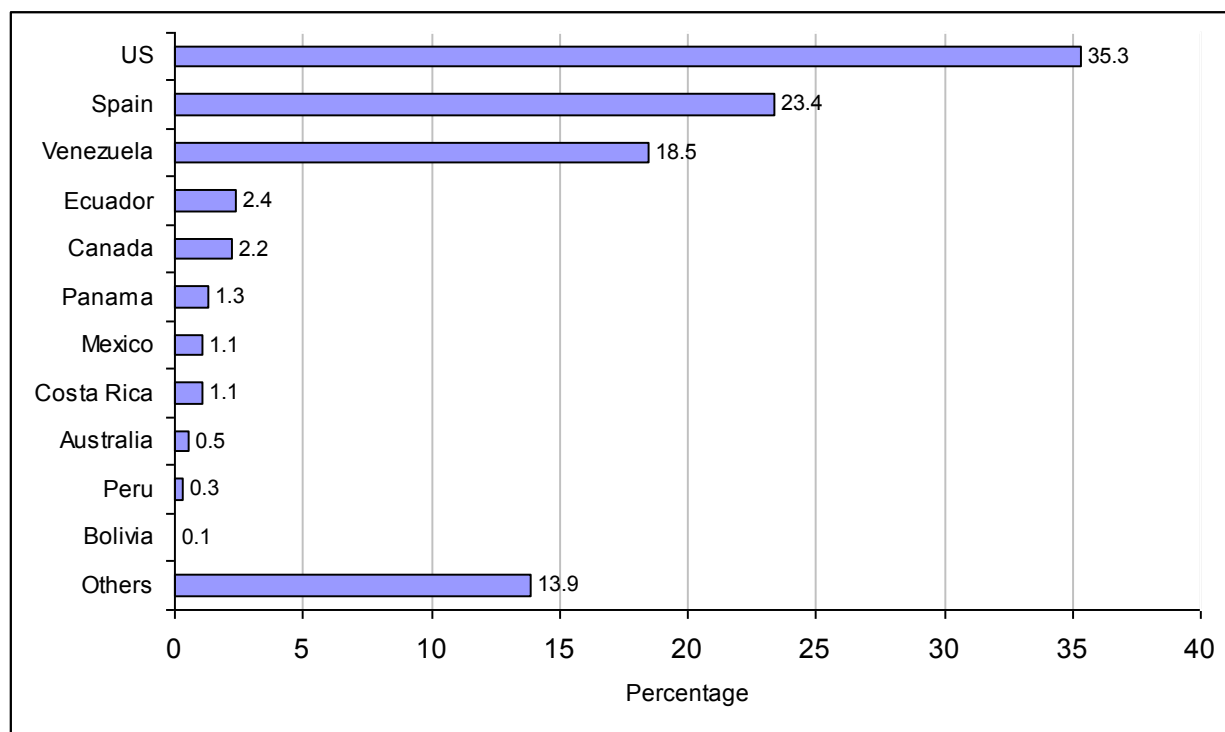


Sources: US Citizenship and Immigration Services

According to the 2005 Colombian census raw data, there are only about 460,000 Colombians abroad; just 14 per cent of the estimated figure previously reported, and around 1 per cent of Colombia's population (as opposed to the estimated 8 per cent). This difference is large but unsurprising as some individuals are reluctant to report having relatives abroad when they are illegal. Also, census data does not include entire families that migrate. For these reasons the census data has been adjusted to reflect a number closer to 8 per cent of the population (which is Colombia's official migrants figure). Figure 4 shows that according to the 2005 Colombian Population Census, most Colombian migrants currently live in the United States (35 per cent),

followed by Spain (23 per cent) and Venezuela (20 per cent). These three countries together host more than 78 per cent of Colombian migrants.

**Figure 4: Residence of Colombian migrants in 2005**



**Source:** 2005 Population Census (National Administrative Department of Statistics (DANE))

## 2.2 The geography of Colombian migration

In order to illustrate the spatial composition of migration, we map the specific places in Colombia which migrants are leaving from, and the countries they are moving to (again using the information from the 2005 Colombian Population Census). Map 1 shows the share of migrants in the population of each municipality organized by quintile (the darkest black is the top quintile and white represents the bottom quintile). The map on the top left is for the total migrant population, whereas the other three represent the same figures by main destination: United States, Spain, and Venezuela.

To simplify the analysis, Map 2 includes only the main agglomerations of municipalities with the largest shares of migrants by destination.<sup>2</sup> There are four main agglomerations of municipalities with large share of their populations represented by international migrants: the northeast zone, which includes municipalities in the states of Atlántico, Bolívar and Magdalena; the western zone, which includes the states of Risaralda, Quindío, Caldas, Valle del Cauca, and Cauca; the northeast zone, which includes the states of Santander, Norte de Santander, and Boyacá; and Bogotá.

As shown in the maps, municipalities sending migrants to the United States are mainly located in the states of Valle del Cauca, Cauca, Risaralda, Quindío, Caldas and Antioquia; those

<sup>2</sup> These are clusters of municipalities from where there are a number of migrants significantly higher than that of their neighbours according to the local Moran index. See Moran (1948) and Anselin (1988).

sending migrants to Spain are located mainly in the same zone as those sending to the United States, and finally, those sending migrants to Venezuela are located mainly in Atlántico, Bolívar, Magdalena, Boyacá, and Norte de Santander.

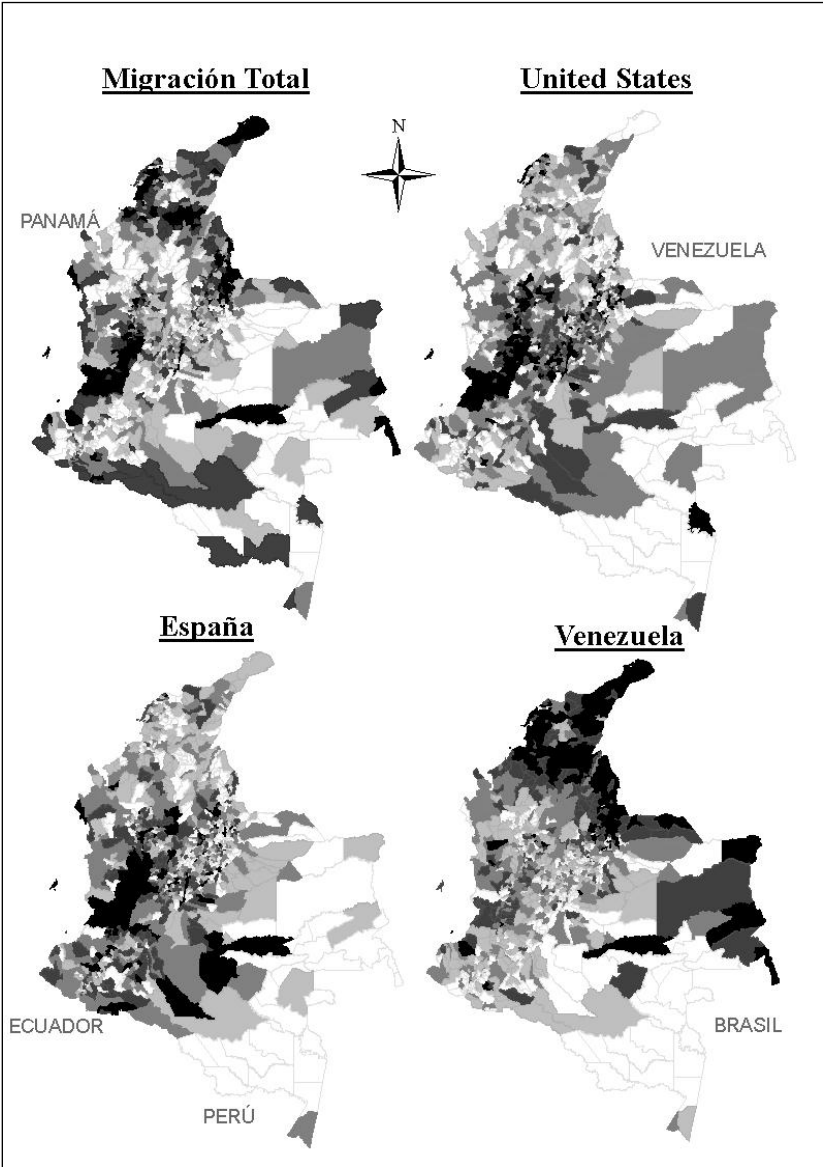
Identifying the driving forces that determine where people from specific regions are more likely to migrate to is beyond the scope of this paper. Proximity seems an important determinant for migration and immigration to and from neighbouring countries, and that seems evident for the cases of Venezuela and Ecuador. Nonetheless, it is not clear why there is more migration to countries like the US or Spain from specific regions of the country. Migrating to the US or Spain is costly, requiring minimum levels of income and the existence of networks to reduce those costs. Apart from that general observation, it is interesting that the coffee producing departments of Antioquia, Caldas and Valle are the main regions exporting migrants to the US and Spain. These can be the result of a combination of economic factors (higher income and years of schooling) and cultural (descendants of internal migrants that came from Antioquia in the late 19<sup>th</sup> century, export-oriented sources of income, etc.). Also, between 1970 and 1990, the production and trafficking of marijuana, cocaine and heroin, mostly to the US market, mainly stemmed from Antioquia and Valle (where the Medellín and Cali drug cartels were based). Gamarra (2003) goes further to argue that the second migratory wave of Colombians to the US, which he reports to have taken place since the late 1970s until the mid 1990s, was related to the movement of migrants linked to the growth in the international trade of narcotics.<sup>3</sup> He cites various sources that allow him to affirm that between 40 to 50 per cent of Colombians in Florida might be illegal, and that nearly 75 per cent of all Colombians going to the US enter the country through Miami.

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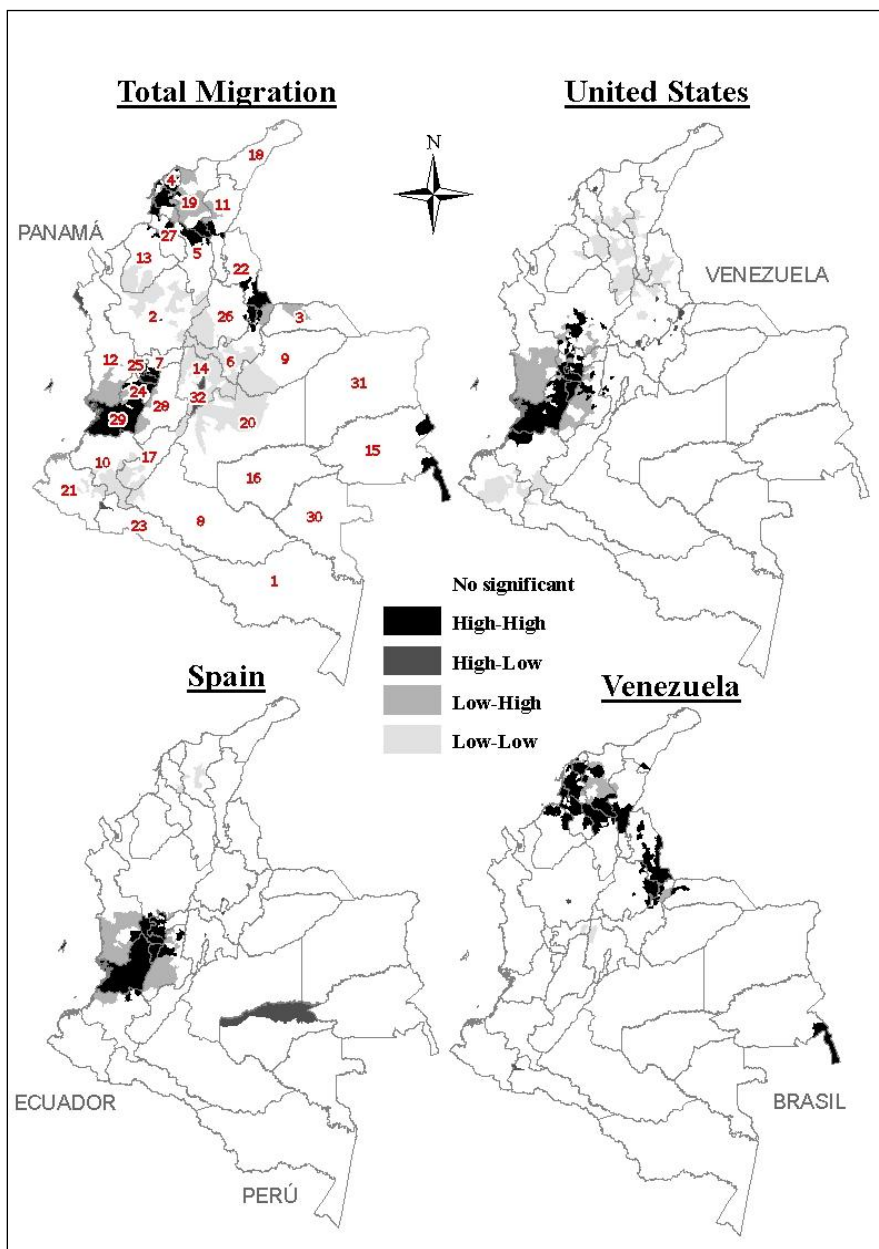
<sup>3</sup> See also Thouni (1995) and Gugliotta and Leen (1989)



**Map 1: Quintiles of the share of migrant population per municipality in 2005 (total and by destination)**



**Map 2: Clusters of the share of migrant population per municipality in 2005 (total and by destination)**



1. Amazonas 2. Antioquia 3. Arauca 4. Atlántico 5. Bolívar 6. Boyacá 7. Caldas 8. Caquetá 9. Casanare 10. Cauca 11. César 12. Chocó 13. Córdoba 14. Cundinamarca 15. Guainía 16. Guaviare 17. Huila 18. La Guajira 19. Magdalena 20. Meta 21. Nariño 22. Norte de Santander 23. Putumayo 24. Quindío 25. Risaralda 26. Santander 27. Sucre 28. Tolima 29. Valle 30. Vaupés 31. Vichada 32. Bogotá

### 2.3 Characteristics of migrants

To develop a picture of Colombian absent and return migrants we use different sources of data which complement one another and provide a more accurate socio-economic description of Colombians living abroad than has been produced to date:

- the 2000 US Population Census;
- the AMCO (West Central Metropolitan Area) Survey conducted in 2004 by DANE, the national statistical office, which interviewed a random sample of households living in Pereira's metropolitan area;
- the RCN survey, which is a survey implemented by the Colombian radio and TV private firm *Radio Cadena Nacional* which migrants freely fill out on the web; and
- our DOTM survey.

When we compare the figures in the different columns of Table 1 above, we find that return migrants tend to be older than absent migrants. Looking at the educational levels of both types of migrants, we also find that while in our DOTM survey return migrants appear to be less educated, they seem to be more educated in the sample of the AMCO and RCN surveys.

The difference in these results might be explained by a few factors: first, since the RCN survey was completed by people who self-select themselves on the web, it is likely that the subset of returnees who answered it are more familiar with new technologies like the internet, and are therefore less representative of the typical return migrant but rather a subset of them that is, on average, more educated. Second, the AMCO survey only covers the metropolitan area of Pereira, which was subject to an enormous volume of migration in the late 1990s and thus has a younger migrant population than the average of the 13 main metropolitan areas surveyed in our project. Since younger generations in Colombia have on average more schooling, an older return migrant (more likely to be captured by the DOTM survey) is likely to have less years of education than a younger one (more likely to be captured by the AMCO survey).

There is also a considerable difference in our DOTM sample in terms of the number of return migrants that speak English, which is much smaller than the number reported by returnees in the AMCO or RCN surveys. This difference might be partly explained by the fact that according to the DOTM survey, returnees from Venezuela (who are less likely to speak English) represent 40 per cent of all returnees, while according to the 2005 census they constitute just 21 per cent. Meanwhile, returnees from the US represent 21 per cent of all returnees in the DOTM survey, while according to the 2005 census they are just over 32 per cent.

**Table 1: Characteristics of absent and returned Colombian migrants**

	Absent migrants				Returned migrants			
	AMCO	US Census	RCN Survey	DOTM	AMCO	RCN Survey**	DOTM	2005 Colombian Census
Age	36.14	41.80		33.51	39.40		42.83	36.27
Years of schooling	11.52	12.30	14.50	10.04	12.88	14.25	7.60	11.02
Sex (Men)	46.9%	43.9%		43.7%	66.7%		47.3%	51.1%
Single	29.8%	22.8%			19.7%		21.1%	36.3%
Years of residence abroad	6.80		5.50	5.66	3.80	5.30	2.17	
Residence	64.7%							
Communicates frequently by telephone with family	62.9%		81.0%	81.8%				
Employed	82.0%	64.2%		76.8%	76.7%		48.1%	47.9%
Unemployed	5.3%	7.7%					6.5%	4.2%
Speaks English		62.3%	79,1%*		55.6%	75,7%*	9.4%	41.7%
Spouse has lived abroad					21.8%		38.9%	
Parents have lived abroad					18.6%			
Sends remittances	71.2%		73.2%	54.5%	99.1%	70.2%	31.8%	
Monthly average amount in US\$	166.8		247.6	254.1				
Spouse lives in Colombia			5.0%	8.5%		5.7%		
Children live in Colombia			21.0%	41.5%		21.5%		
Parents live in Colombia			73.8%			73.2%		

**Sources:** Medina and Cardona (2006) and authors' calculations based on the DOTM Colombian Household Survey (\* In this survey applies if speaks a language different to English. \*\* In this survey applies to those who claim they wish to return).

The different concentration of migrants in different destination countries in the DOTM and other surveys, in turn, may be related to the fact that DOTM examines short term and seasonal migration (including migration for 3–12 months), as well as the longer movements which tend to be the focus of other surveys. Given that seasonal and short term moves frequently take place over shorter distances, this may help to explain why the DOTM survey finds that a greater proportion of migration takes place between Colombia and its neighbouring countries than previous analyses.

Drawing out some of the other key facts from the different data sources, it appears that:

- Both absent and return migrants are more likely to be female.
- According to the AMCO survey, 67 per cent of absent migrants reported leaving for work-related reasons, 17 per cent migrated to study, 11 per cent left for family related reasons and 5 per cent departed because of armed conflict.
- According to the 2000 US Population Census, the majority of Colombians living in the US are not US citizens, while 80 per cent live with their families, and half of these have children under 18 years of age. Slightly more women (54 per cent) have migrated to the US than men (46 per cent), which is consistent with data from other sources.
- Migrants tend to have more years of schooling than the average Colombian: just over 12 years compared to nearly 9 years. In addition, 30 per cent of the migrants over 25 years of age have tertiary education, compared to only 5 per cent of the population in Colombia.
- The average income of migrants is approximately US\$25,000 per year in the US, compared to US\$6,200 in Colombia (PPP adjusted).<sup>4</sup>

Following this broad review of migrants' characteristics taken from the various available surveys, we use the DOTM dataset to examine certain characteristics in greater depth. Table 2 provides some descriptive statistics for households with and without experience of migration, while Table 3 compares households that do and do not receive remittances.

The characteristics of households receiving remittances are similar to those of households that contain migrants. This will be explained in part by the fact that many households fall into both groups (though households can receive remittances even if one of their own members has not migrated, and vice versa). Findings from the DOTM survey indicate that almost 43 per cent of households with experience of migration (i.e. containing absent and/or return migrants) receive remittances, with nearly 30 per cent of these being households with return migrants only. Meanwhile, nearly 4 per cent of households without experience of migration receive remittances. This figure sounds small, but as this group make up the vast majority of the Colombian population, it actually adds quite significantly to the total number of households receiving remittances. In fact, they make up 64 per cent of all Colombian households that receive remittances. Households with absent migrants that receive remittances make up the other 36 per cent.

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<sup>4</sup> Throughout this report, we use \$ to denote Colombian pesos and US\$ for US dollar figures. The exchange rate is approximately COP\$2,000 per US dollar (June 2009). Unless indicated otherwise, monetary figures correspond to per month measures.

**Table 2: Descriptive statistics for households with and without experience of migration**

	Households with migration experience		Households without migration experience		t
	Mean	Standard deviation	Mean	Standard deviation	
0-5 (number of people 5 years ago)	0.379	0.729	0.383	0.62	-0.1
6-17 (number of people 5 years ago)	0.762	0.978	0.922	1.036	-2.76**
18-29 (number of people 5 years ago)	0.712	0.899	0.828	0.899	-2.24**
30-39 (number of people 5 years ago)	0.485	0.702	0.536	0.705	-1.25
40-49 (number of people 5 years ago)	0.442	0.645	0.559	0.736	-2.92**
50-59 (number of people 5 years ago)	0.362	0.651	0.295	0.588	1.86*
60+ (number of people 5 years ago)	0.524	0.708	0.314	0.607	5.51**
Highest number of years of education for members of the Hhold aged 25+	10.837	4.082	8.737	3.571	9.29**
[Highest number of years of education for members of the Hhold aged 25+]²	134.102	92.634	89.093	63.666	9.63**
Lowest number of years of education for members of the Hhold aged 25+	5.892	4.148	6.064	3.745	-0.74
[Lowest number of years of education for members of the Hhold aged 25+]²	51.921	64.021	50.791	51.465	0.33
Number of people in household 5 years ago	4.355	2.121	3.643	2.086	5.86**
Did any current member of the household respond differently to other members to the question: "Where did you live 5 years ago?"	0.06	0.237	0.08	0.271	-1.36
Did the household have an account in a financial institution 5 years ago?	0.412	0.492	0.365	0.482	1.66*
If so, did the household use this account to fund a business 5 years ago?	0.051	0.22	0.06	0.237	-0.69
Labour participation 5 years ago (males)	0.604	0.436	0.614	0.429	-0.36
Labour participation 5 years ago (females)	0.396	0.43	0.421	0.427	-0.99
Did the household own the home that it lived in 5 years ago?	0.713	0.452	0.553	0.497	5.84**
Did the household have access to land 5 years ago?	0.034	0.182	0.028	0.166	0.58
Did the household own at least one business 5 years ago?	0.112	0.315	0.15	0.357	-1.98**

Source: DOTM Colombian Household Survey (authors' calculations)

**Table 3: Descriptive statistics for households with and without remittances**

	Households receiving remittances		Households not receiving remittances		t
	Mean	Standard deviation	Mean	Standard deviation	
0-5 (number of people 5 years ago)	0.5	0.672	0.377	0.62	2.65**
6-17 (number of people 5 years ago)	0.995	0.789	0.914	1.047	1.28
18-29 (number of people 5 years ago)	0.714	0.692	0.83	0.907	-2.10**
30-39 (number of people 5 years ago)	0.651	0.684	0.528	0.706	2.50**
40-49 (number of people 5 years ago)	0.468	0.718	0.563	0.735	-1.82*
50-59 (number of people 5 years ago)	0.233	0.545	0.3	0.592	-1.67*
60+ (number of people 5 years ago)	0.462	0.71	0.311	0.602	3.14**
Highest number of years of education for members of the Hhold aged 25+	9.896	3.677	8.719	3.575	4.46**
[Highest number of years of education for members of the Hhold aged 25+]²	111.456	71.489	88.799	63.913	4.54**
Lowest number of years of education for members of the Hhold aged 25+	6.125	4.247	6.044	3.714	0.28
[Lowest number of years of education for members of the Hhold aged 25+]²	55.545	60.283	50.321	50.889	1.26
Number of people in household 5 years ago	4.134	1.647	3.641	2.116	3.79**
Did any current member of the household respond differently to other members to the question: "Where did you live 5 years ago?"	0.046	0.209	0.081	0.273	-2.10**
Did the household have an account in a financial institution 5 years ago?	0.293	0.455	0.37	0.483	-2.31**
If so, did the household use this account to fund a business 5 years ago?	0.05	0.219	0.06	0.237	-0.59
Labour participation 5 years ago (males)	0.489	0.444	0.543	0.449	-1.69*
Labour participation 5 years ago (females)	0.336	0.387	0.411	0.429	-2.61**
Did the household own the home that it lived in 5 years ago?	0.558	0.497	0.557	0.497	0.03
Did the household have access to land 5 years ago?	0.025	0.157	0.028	0.166	-0.26
Did the household own at least one business 5 years ago?	0.128	0.334	0.151	0.358	-0.94
Number of people with complete tertiary education or more	0.131	0.394	0.102	0.367	1.05

Source: DOTM Colombian Household Survey (authors' calculations)

### 3. Impact analysis of migration and remittances

In this section, we evaluate the impacts of migration and remittances on a broad set of economic, educational, health, quality of life, and gender outcomes (for the household members that stay in Colombia). These impacts can take place through various different channels, from the most straightforward - income in the form of remittances (which has been widely analysed, for example by Rapoport and Docquier (2006)) – to others such as diaspora networks and return migration, as suggested by Katseli *et al.* (2006). In our impact analysis we do not specifically examine the channels through which the impacts are occurring, but we do make suggestions as to the main channels through which migration and remittances might be driving our results. We use a propensity score matching methodology to undertake our impact analysis, which should provide relatively accurate estimations. An outline of this methodology is provided in Appendix B.

#### 3.1 Labour market impacts

In this section we consider the effects of migration and remittances on labour market participation and unemployment. The experience of migration may affect decisions regarding labour market participation in various ways.

For example, income from remittances can reduce the incentive to participate in the labour force for some members of the household through increasing the ‘reservation wage’ (that is, the lowest wage for which they would be willing to work). In other cases, remittances may facilitate the establishment of family businesses, leading some household members to shift to self employment. In the case of returned migrants, greater labour market participation could result from higher human capital accumulated abroad. There are also potential general equilibrium effects – effects which spread beyond the migrant and their household out into wider society – with migration impacting upon on the unemployment rate, for example, or on wage rates paid.

In the case of returned migrants, greater labour market participation could be the result of higher human capital accumulated abroad. There are also potential general equilibrium effects resulting from the impact of migration on the unemployment rate and the equilibrium wage. The empirical evidence available for other countries points in the direction of lower participation rates for households receiving remittances. This is what Acosta (2006) has found for adult females in El Salvador and Mishra (2003) in rural Mexico. In addition, the World Bank (2006) finds that for a large sample of Latin American countries, remittances reduce both labour force participation and hours of work.

Table 4 presents the labour market results based on matching estimates.<sup>5</sup> The ‘ATT column’ is the estimate of the impact of migration experience or remittances according to the row studied, and the final column presents the *t*-statistic of the estimate. Table 4 has cross section (CS) and difference-in-differences (DD) results at the individual level for the impact of migration experience and remittances on labour participation, the unemployment rate and self-employment (only CS estimates in this case).

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<sup>5</sup> Unless otherwise noted, all graphs use the following definitions:

ATT: Average effect of Treatment on the Treated; ME: Effect of Migration Experience; RR: Effect of Receiving Remittances: *Family* (compares households receiving remittances from relatives with households that do not receive remittances), and *All* (compares households receiving remittances from any source with households not receiving remittances).



**Table 4: Effects of migration experience and remittances in the labour market**

	Males and Females			Males			Females		
Cross Section Estimators									
	ATT	Std. Err.	t	ATT	Std. Err.	t	ATT	Std. Err.	t
Labour Participation									
ME	-0.028	0.017	-1.659*	-0.047	0.029	-1.61	-0.012	0.024	-0.51
ME Absent	-0.058	0.019	-3.071**	-0.083	0.023	-3.594**	-0.030	0.025	-1.17
ME Returnee	-0.032	0.022	-1.46	-0.054	0.032	-1.673*	-0.012	0.027	-0.44
RR Family	-0.089	0.021	-4.195**	-0.110	0.028	-3.961**	-0.063	0.027	-2.384**
RR All	-0.072	0.021	-3.392**	-0.096	0.029	-3.259**	-0.041	0.028	-1.44
Unemployment Rate									
ME	0.007	0.008	0.95	0.029	0.015	1.992**	-0.014	0.007	-1.93*
ME Absent	0.003	0.008	0.39	0.030	0.016	1.817*	-0.018	0.008	-2.328**
ME Returnee	0.010	0.012	0.88	0.021	0.018	1.18	0.001	0.012	0.09
RR Family	0.008	0.013	0.67	0.050	0.025	2.037**	-0.022	0.009	-2.507**
RR All	0.008	0.011	0.75	0.044	0.021	2.045**	-0.017	0.008	-2.114**
Self-Employment									
ME	0.007	0.013	0.56	0.023	0.026	0.90	-0.010	0.015	-0.68
ME Absent	0.004	0.016	0.23	0.018	0.027	0.68	-0.003	0.019	-0.18
ME Returnee	0.000	0.017	0.01	0.014	0.025	0.55	-0.011	0.018	-0.61
RR Family	-0.011	0.014	-0.74	-0.020	0.028	-0.74	0.002	0.024	0.07
RR All	-0.007	0.013	-0.57	-0.027	0.028	-0.96	0.014	0.019	0.72
Difference-in-Differences Estimators									
	ATT	Std. Err.	t	ATT	Std. Err.	t	ATT	Std. Err.	t
Labour Participation									
ME	-0.010	0.017	-0.60	-0.007	0.022	-0.33	-0.011	0.023	-0.49
ME Absent	-0.027	0.017	-1.57	-0.020	0.026	-0.78	-0.032	0.029	-1.10
ME Returnee	-0.024	0.020	-1.22	0.000	0.023	-0.01	-0.031	0.030	-1.04
RR Family	-0.027	0.019	-1.46	-0.004	0.029	-0.15	-0.040	0.024	-1.645*
RR All	-0.035	0.021	-1.642*	-0.016	0.026	-0.61	-0.047	0.027	-1.754*
Unemployment Rate									
ME	0.000	0.009	0.03	0.023	0.018	1.25	-0.020	0.011	-1.909*
ME Absent	0.002	0.012	0.18	0.034	0.020	1.737*	-0.022	0.010	-2.106**
ME Returnee	-0.002	0.012	-0.13	0.004	0.021	0.20	-0.006	0.014	-0.44
RR Family	0.010	0.012	0.85	0.062	0.026	2.365**	-0.023	0.013	-1.792*
RR All	0.004	0.010	0.36	0.039	0.026	1.51	-0.022	0.013	-1.63

Source: DOTM Colombian Household Survey (authors' calculations)

Although it might be expected that the labour force participation rate of household members would be affected if the household contained an absent and/or return migrant, the reported results suggest that this is not the case. According to our CS estimates, there is some weak evidence that migration experience would reduce labour participation by nearly 3 per cent, and almost 6 per cent in households with an absent migrant. As it becomes clear from the table, the effect is driven by the response of males living in households with an absent migrant, who would

be just over 8 per cent less likely to participate. However, according to our DD estimates, which are more accurate, these magnitudes are smaller and not significant.

On the contrary, remittances do seem to have a negative effect on labour force participation according to both our CS and DD estimates. Here we rely more on our DD estimates, according to which individuals in households receiving remittances from any source are between 3-4 per cent less likely to participate in the labour market, an effect mostly driven by the responses of females, who are almost 5 per cent less likely to participate.

In terms of the unemployment rate in Colombia, both CS and DD estimates lead to similar conclusions. Migration does not affect unemployment for the whole set of surveyed individuals, although we find that the unemployment rate for females falls by 2 per cent, in particular, if they belong to a household with an absent migrant. There is also a weakly significant positive effect for males living in households with an absent migrant. In that case, male unemployment rates increase by a little over 3 per cent. Meanwhile, remittances sent by family members increase the unemployment rate of all individuals by around 2 per cent, which is the result of opposite effects on males' and females' unemployment rates, with males' rising by between 6-7 per cent, and females' declining by just over 2 per cent.

Cross section estimates of the effects of migration experience and remittances on self-employment are shown in the bottom panel of the cross section estimates in Table 4. Results show that neither the experience of migration nor remittances have a significant effect on the probability that household members become self-employed.

### **3.2 Impacts on household per-capita income and expenditure**

In this section we study the effect of migration experience and remittances on households' per capita income with and without remittances, that is, including all sources of income in the household but remittances. Although our main objective is related to the latter, the former will allow us to see how vulnerable households would be if they stopped receiving these funds.

Table 5 shows that household per-capita income without remittances is only affected by migration in households with an absent migrant, in which case monthly income is increased about \$143,000 (or US\$71.50), while household per-capita income with remittances increases on average for households with migration experience, mostly due to the effect of households with an absent migrant, in which case income is increased by about \$195,000 (US\$97.50).

These results imply that the largest share of any increase in household per capita income is more likely to be caused by benefits derived from migration other than the current level of remittances received. Those other benefits may derive from previous remittances received by the household members, and used for example for human capital accumulation (such as investments in education or health), savings or to build up the household's stock of assets (such as businesses, or to improve housing). They may also result from transfers of knowledge either directly (through the absent migrant) or indirectly (by being in touch with the absent migrant's environment and culture).

**Table 5: Effects of migration and remittances on per-capita income and expenditure**

	ATT	Std. Err.	t	ATT	Std. Err.	t
	<b>Household Per-capita Income without Remittances</b>			<b>Per-capita Home Products Expend.</b>		
<b>ME</b>	83,140	63,657	1.31	12,859	9,479	1.36
<b>ME Absent</b>	143,000	64,006	2.228**	33,658	12,456	2.702**
<b>ME Returnee</b>	85,524	68,479	1.25	16,479	9,926	1.66*
<b>RR Family</b>	-5,957	75,966	-0.08	31,546	14,417	2.188**
<b>RR All</b>	77,047	67,816	1.14	28,753	12,661	2.271**
	<b>Household Per-capita Income with Remittances</b>			<b>Per-capita Recreation Expenditure</b>		
<b>ME</b>	107,000	66,599	1.60	3,857	2,354	1.638*
<b>ME Absent</b>	195,000	72,245	2.702**	4,291	2,774	1.55
<b>ME Returnee</b>	98,957	77,055	1.28	2,605	1,416	1.839*
<b>RR Family</b>	48,486	73,773	0.66	2,834	1,725	1.643*
<b>RR All</b>	125,000	58,127	2.154**	3,386	1,513	2.238**
	<b>Total Per-capita Expenditure</b>			<b>Per-capita Housing Expenditure</b>		
<b>ME</b>	69,749	25,413	2.745**	-6,322	4,919	-1.29
<b>ME Absent</b>	83,384	37,078	2.249**	-11,500	22,502	-0.51
<b>ME Returnee</b>	87,722	23,307	3.764**	-5,486	7,018	-0.78
<b>RR Family</b>	96,878	38,879	2.492**	-7,807	7,071	-1.10
<b>RR All</b>	74,152	29,137	2.545**	-9,441	6,712	-1.41

Source: DOTM Colombian Household Survey (authors' calculations)

When we study the effect on households' per-capita income including remittances in households' income, we also find a positive effect of remittances. According to our estimates, monthly household per-capita income would increase up to \$125,000 (about US\$62) for households receiving remittances from any source.<sup>6</sup>

Table 5 also shows the impacts of migration and remittances on several types of expenditures. Both migration and remittances increase total per-capita expenditure. Migration experience increases it by nearly \$70,000 (US\$35), while remittances increase it by between \$74,000 (US\$37) and \$97,000 (US\$48.50). The table looks at the effects on per-capita expenditure of home products (groceries, toiletries and cosmetics, supplies for cleaning the house, food and alcoholic drinks consumed within the household), recreation, and housing (buying or repairing the house).

Migration does not appear to have a significant effect on the whole population for any of these expenditures except for recreation (at the 10 per cent level of significance), and mostly in households with return migrants. Expenditure on home products also increases when we assess households with absent and return migrants. Remittances also seem to have a positive effect on spending on home products and recreation, but not on housing expenditure.

<sup>6</sup> This may appear to contradict the result discussed in the paragraph above, where it appeared as though the effect of remittances was \$52,000. It should be noted, however, that households receiving remittances from any source include many households who do not have migration experience, and vice versa.

### 3.3 Impacts on inequality

Existing evidence of the effect of remittances on income inequality in Latin American countries is mixed. Acosta et al. (2008) find that remittances reduce income inequality in Haiti, Guatemala, El Salvador, Nicaragua, and Honduras; have a negligible effect in Bolivia, Ecuador, Paraguay and Peru; and increase inequality in Dominican Republic and Mexico. In the Colombian case the anecdotal evidence suggests that migration is expensive so households at the lower end of the income distribution cannot afford it. This means that low income households have fewer chances of benefiting from international migration, and then, from remittances.

But to be able to say something conclusive on the subject we need additional calculations. To study changes in income distribution we present and contrast two approaches. We start with an *accounting approach* where we assume that income without remittances would have been equal to the current income minus the amount of remittances reported (for those households with remittances). In the alternative *counterfactual approach*, we use estimated income (from the matching estimates) in order to infer the income households would have had without migration and/or remittances.

#### a. Accounting Approach

Table 6 shows some basic information regarding the distribution of total annual remittances.<sup>7</sup> The panel on the left classifies households that receive remittances by income quintile, where the income quintile is that in which households receiving remittances are located once we order *all* households (receiving and not receiving remittances) according to their per capita income without remittances. According to this criterion, households that receive remittances are more likely to belong to the bottom and top quintiles (49 percent and 29 percent, respectively). The table also has information about the distribution of remittances. Households in the first quintile of the income (without remittances) distribution receive 16.3 percent of remittances, while households in the top quintile receive 45.4 percent of remittances.

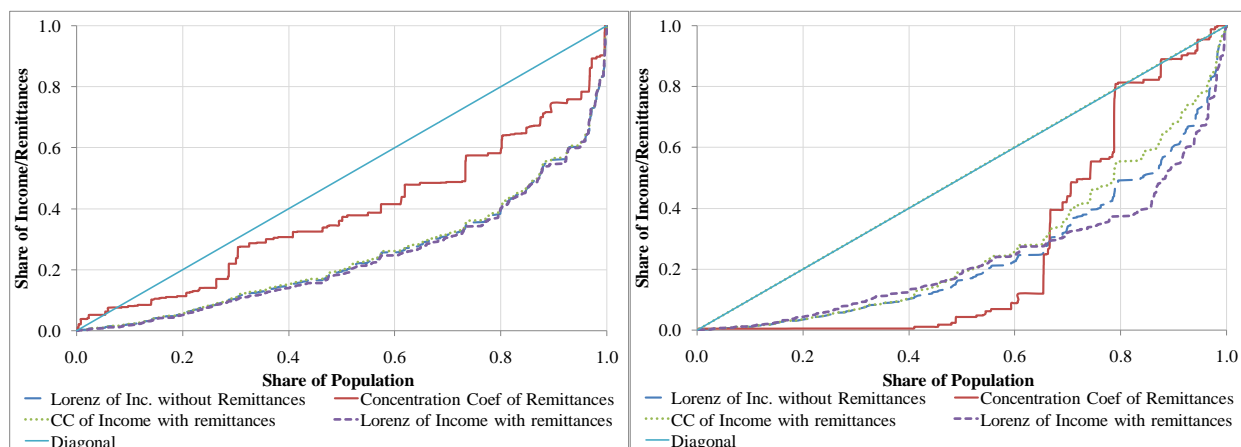
The second panel classifies households into quintiles but now using total per capita income (including remittances). In this case, 41.3 percent of households receiving remittances belong to the bottom quintile. Interestingly, 61.3 percent of the remittances are received by households in the top quintile of the income (with remittances) distribution. This means that when remittances are included in the definition of income, fewer households receiving remittances belong to the bottom quintile, and more remittances go to the top quintile.

**Table 6. Households and remittances distributions using total and accounting income. Households receiving remittances**

Quintile	Income quintile organised by:											
	Income without remittances				Income with remittances				Difference			
	Households		Remittances		Households		Remittances		Households		Remittances	
	N	%	\$ MI	%	N	%	\$ MI	%	N	%	\$ MI	%
1	42.1	49.0	8.3	16.3	35.5	41.3	4.1	8.1	-6.6	-7.7	-4.2	-8.2
2	9.0	10.4	11.0	21.5	11.3	13.1	5.4	10.5	2.3	2.7	-5.6	-11.0
3	3.4	3.9	2.1	4.0	5.7	6.6	4.5	8.9	2.3	2.7	2.5	4.8
4	6.4	7.5	6.6	12.8	7.2	8.4	5.7	11.2	0.8	0.9	-0.8	-1.6
5	25.1	29.2	23.2	45.4	26.3	30.6	31.4	61.3	1.2	1.4	8.2	15.9
<b>Total</b>	85.9	100.0	51.1	100.0	85.9	14.5	51.1	100.0	0	0	0	0
<b>CC</b>	-0.170		0.198		0.088		0.359					

To quantify the redistributive effect of remittances we calculate the Gini coefficient before and after remittances. Figure 5 helps us to understand this exercise. Each point in the figure shows the share of income (in the vertical axis) accruing to a corresponding share of population (in the horizontal axis). The closer the curve to the diagonal line, the more egalitarian is the distribution of income in the population.

**Figure 5. Distribution of Remittances and their Effect on Income Distribution**  
**Accounting Approach** **Counterfactual Approach**



The dashed curve illustrates the distribution of income without remittances, our baseline income distribution according to the *accounting approach*. Twice the area between that curve and the diagonal is what is defined as the Gini coefficient of income before remittances. The solid line shows the distribution of remittances. The line depicts what we already know from table 6: the poorest 20 (60) percent of the households receive about 16 (42) percent of total remittances.

Once we add remittances to the income without remittances, and maintain the order of households according to the income without remittances, we get the dotted curve, which is closer to the diagonal. This illustrates the gains in progressivity with respect to the initial distribution of income. However, changes in the income distribution shown in figure 5 are very small due to the fact that although remittances are very important for their beneficiary households, they are only received by a small share of households, thus having a small impact on income distribution when adopting the *accounting approach*.

In sum, we use two definitions of income: (i) income without remittances (our baseline income) and (ii) income with remittances. We use two criteria for ordering households: (i) according to their per capita income without remittances, and (ii) according to their per capita income with remittances. Households must be ordered according to their per capita income without remittances when we want to calculate the baseline Gini coefficient, and with remittances when we want to calculate the final Gini coefficient.

We follow Kakwani (1977 and 1984) to estimate the concentration coefficient of remittances, a concept which is similar to that of the Gini coefficient, and tells us whether remittances are received proportionally more by the poor or the rich. To estimate the concentration coefficient, we perform a similar calculation to that made to estimate the Gini coefficient, but in this case, we do not use income but remittances only, and we keep the order households had with their

income without remittances.<sup>8</sup> Positive values of this coefficient imply that on average remittances are regressive and negative values imply that they are on average progressive. Our estimate of the concentration coefficient of remittances is 0.198 (see last row in table 6), meaning they are on average more likely to be received by the rich. However, this value is lower than the Gini coefficient without remittances (0.3676), meaning the remittances are considerably less regressive than the other sources of income.

Then we estimate the concentration coefficient of income with remittances maintaining the order households had according to their per capita income without remittances. If remittances are less concentrated than other sources of income, then the concentration coefficient of income with remittances must be smaller than the Gini coefficient. This is indeed what happens: The concentration coefficient obtained once we include remittances in household's income, keeping the order they had without remittances, is 0.3661. Here again, the gain in distribution is small due to the small share of households receiving remittances.

Remittances are equitable according to the vertical criteria whenever there are more remittances received by individuals in the lowest percentiles of the income distribution. Nonetheless, if the amount is considerably large, recipients can become richer than other households that were richer than them before receiving remittances. In this case, a phenomenon known as horizontal inequity (in the targeting of remittances) arises. Note that if there were no horizontal inequities in the assignment of remittances, income with remittances would be already ordered in per capita terms, and thus the concentration coefficient of income with remittances would actually be the Gini coefficient of income with remittances.

However, the amount of remittances received by households is of an important magnitude so it is very likely that remittances involve large horizontal inequities. For example, per capita income without remittances over all households is less than \$310,000, and with remittances is slightly below \$350,000. Once we order households according to their income with remittances, we find that the final Gini coefficient is 0.3670, slightly smaller than the initial coefficient.

Although the accounting approach is very useful to give insights about the magnitude of the distributive effects of remittances, it has several limitations that prevent it from accurately capturing what actually happens to households with either migration experience or receiving remittances. The key assumption is that income without the *effect* of remittances is just the total income of households minus their remittances. This means that no household ends up with lower income than the income it had without remittances. But there is no reason to impose ex ante the condition that income (without remittances) remains the same, regardless of whether the household receives remittances or not. In the case of households with migration experience and remittances this assumption implies that the contribution of the migrant to income was nil.

Although remittances can generally be higher than the migrant's original contribution to household income, there is evidence suggesting that this is not always the case. For example, Ozden (2006) shows that only 47 percent of Colombians with university degrees living in the United States have skilled jobs. The figures for Mexico and Brazil are 32 and 51 percent, respectively. In addition, Medina and Posso (2009) show that Colombians perform less qualified tasks than migrants from most South American countries like Argentina, Bolivia, Chile, Uruguay and Venezuela.

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<sup>8</sup> A straightforward formulation of the Gini coefficient if we used only information by income quintile would be:  $G = (2/5) * \sum_{i=1 \text{ to } 5} i * x_i - 1 - 1/5$ , where  $x_i$  is the share of income of quintile  $i$ , and households are sorted through quintiles according to their per capita income, with those with the lowest per capita income in quintile 1. For the concentration coefficient the formula is the same, but in this case  $x_i$  is the share of remittances of quintile  $i$ , and households are still sorted through quintiles according to their per capita income.

Stakeholders also pointed to the difficulties migrants and their families face when they often leave behind their relatives and work in other countries with much lower socioeconomic status, at times subject to discrimination and abuses. Under plausible conditions remittances might not always be enough to compensate the migrant's household income before migrating. In other words, households with migration experience and remittances can experience a net income loss.

The previous discussion suggests the need to introduce the *counterfactual approach*, which allows us to simulate the earnings migrants would have had if they had not migrated. This is essential in order to assess the distribution of income before and after migration and remittances.

### b. Counterfactual Approach

The migrants' counterfactual income is the income a household would have had if it had not experienced migration. This approach is in the spirit of those undertaken by Adams (1989), Barham and Boucher (1998), and Acosta et al. (2008), which estimated migrant's earnings without remittances based on a set of their characteristics and compare the distribution of that income with and without migration experience. Rather than replicating their exercise, we take advantage of the matching estimates of migration experience and remittances discussed above. Specifically, we estimate income for each household as a weighted average of the income of a set of households with similar characteristics without migration experience (or not receiving remittances).<sup>9</sup>

As shown in Figure 5, households at the bottom 40 percent of the counterfactual income distribution do not receive remittances; while according to the accounting approach, households at the bottom 40 percent of the income distribution receive approximately 37 percent of all remittances (see Table 7). This means that by subtracting remittances from observed income we underestimate the income households would have had if they were not receiving remittances. From the distributional viewpoint this implies that the share of poor households that are beneficiaries of remittances is overestimated in the accounting approach.

**Table 7. Households and remittances distributions using counterfactual and accounting income. Households receiving remittances**

Quintile	Income quintile organised by:											
	Income without remittances				Counterfactual income				Difference			
	Households		Remittances		Households		Remittances		Households		Remittances	
	N	%	\$ MI	%	N	%	\$ MI	%	N	%	\$ MI	%
<b>1</b>	42.1	49.0	8.3	16.3	12.5	14.5	0.6	1.2	-29.6	-34.4	-7.7	-15.0
<b>2</b>	9.0	10.4	11.0	21.5	12.5	14.5	0.6	1.2	3.5	4.1	-10.4	-20.3
<b>3</b>	3.4	3.9	2.1	4.0	16.5	19.3	7.6	14.9	13.2	15.3	5.6	10.9
<b>4</b>	6.4	7.5	6.6	12.8	32.3	37.6	36.7	71.8	25.9	30.1	30.2	59.0
<b>5</b>	25.1	29.2	23.2	45.4	12.1	14.0	5.5	10.8	-13.0	-15.1	-17.7	-34.6
<b>Total</b>	85.9	100.0	51.1	100.0	85.9	14.5	51.1	100.0	0	0	0	0
<b>CC</b>	-0.170		0.198		0.088		0.359					

Table 7 compares the distribution of households and total annual remittances per quintiles of the population according to the accounting and counterfactual approaches. According to the counterfactual approach, remittances are received mostly by households at the top 60 percent of the income distribution, implying greater concentration than what the simple accounting

<sup>9</sup> Notice that in this section we have to rely on the more restrictive assumption explained above, according to which  $Y_0 \perp D|X$ , rather than on the less restrictive one related to the average  $E(Y_0|D=1, X) = E(Y_0|D=0, X)$ .

approach suggests. In fact, the concentration coefficient of remittances is 0.198 using the accounting approach and 0.359 measuring income with the counterfactual approach. Table 8 shows how remittances change the income distribution according to the *counterfactual approach*. In net, 16.6 percent of households move to the top 20 percent of the distribution after remittances. Under this approach, inequality actually increases due to remittances, from an initial Gini coefficient of 0.3638 to a final of 0.3821.

**Table 8. Households and remittances distributions using counterfactual and total income. Households receiving remittances**

Quintile	Income quintile organised by:											
	Counterfactual income				Income with remittances				Difference			
	Households		Remittances		Households		Remittances		Households		Remittances	
	N	%	\$ MI	%	N	%	\$ MI	%	N	%	\$ MI	%
1	25.0	29.1	1.3	2.5	35.5	41.3	4.1	8.1	23.0	26.7	3.5	6.9
2					11.3	13.1	5.4	10.5	-1.2	-1.4	4.7	9.3
3	16.5	19.3	7.6	14.9	5.7	6.6	4.5	8.9	-10.9	-12.7	-3.1	-6.1
4	32.3	37.6	36.7	71.8	7.2	8.4	5.7	11.2	-25.1	-29.2	-31.0	-60.6
5	12.1	14.0	5.5	10.8	26.3	30.6	31.4	61.3	14.2	16.6	25.8	50.5
<b>Total</b>	85.9	100	51.5	100	85.9	100	51.1	100	0	0	0	0
<b>CC</b>	0.088		0.359		-0.104		0.429					

Figure 6 shows the results of assessing the effects of migration experience on income distribution. It shows the distribution of counterfactual income which is the income households with migration experience would have had if they had not experienced migration. In this case, that Gini coefficient is 0.3780, the concentration coefficient of remittances is 0.4849, the concentration coefficient of income with remittances is 0.3713, and finally, the Gini coefficient of the income with remittances is 0.3812, actually larger than the one households had before migration experience. That is, both remittances and migration experience increase income inequality.

**Figure 6. Effect on Income Distribution of Migration Experience**



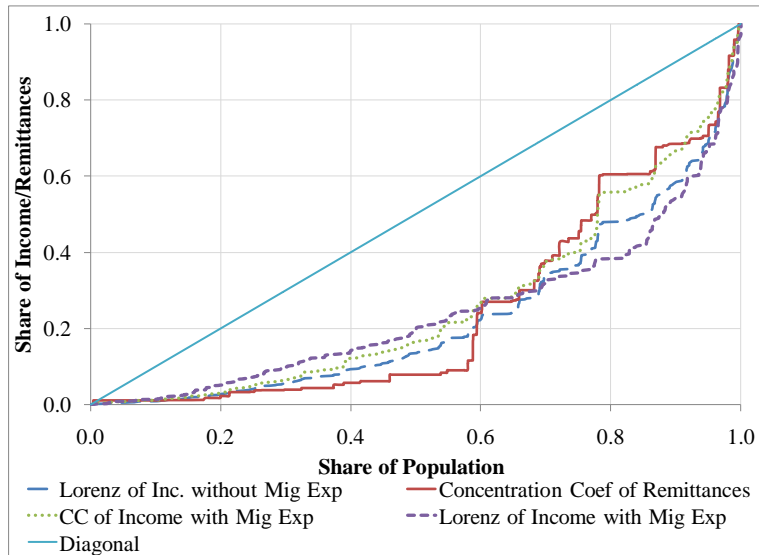
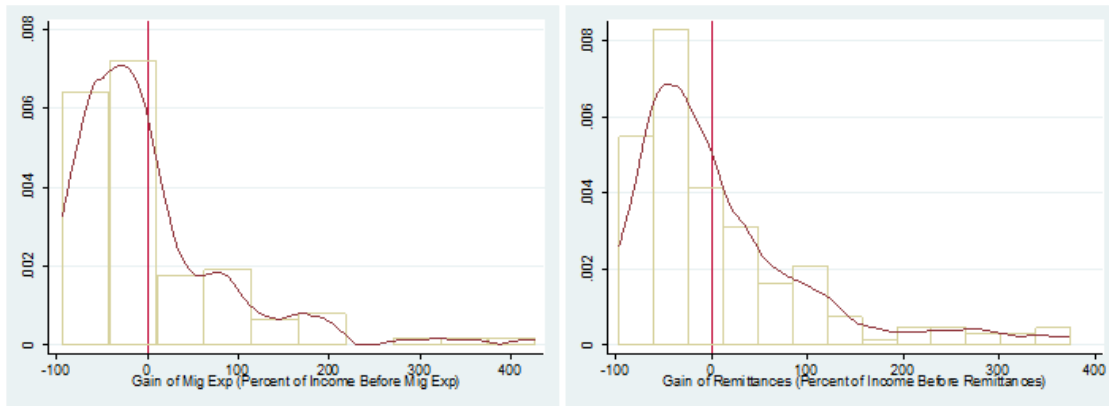


Figure 7 illustrates the distribution of gains from migration experience (on the left) and remittances (on the right). Although the expected gain is positive in both cases, there are risks too (associated with the possible loss of up to 100 percent the counterfactual income). This means that a risk averse individual who knows this distribution in advance, would only be willing to migrate if the expected gain is large (which is more likely to occur for individuals at the very bottom of the income distribution).

**Figure 7. Distribution of Gains of Migration Experience and Remittances.**



In sum, both migration experience and remittances involve a risky decision from the part of the households. After such decisions there are winners and losers, with a net gain in both cases that increases inequality.

### 3.4 Impacts on poverty

We estimate the impacts of migration and remittances on the probability of households being under the poverty line using several different poverty measures: the US 1-dollar and 2-dollar per day lines (adjusted by purchasing power parity (PPP)), and the national *extreme poverty* and *poverty* lines.<sup>10</sup> Figure 8 illustrates the distribution of household income before and after

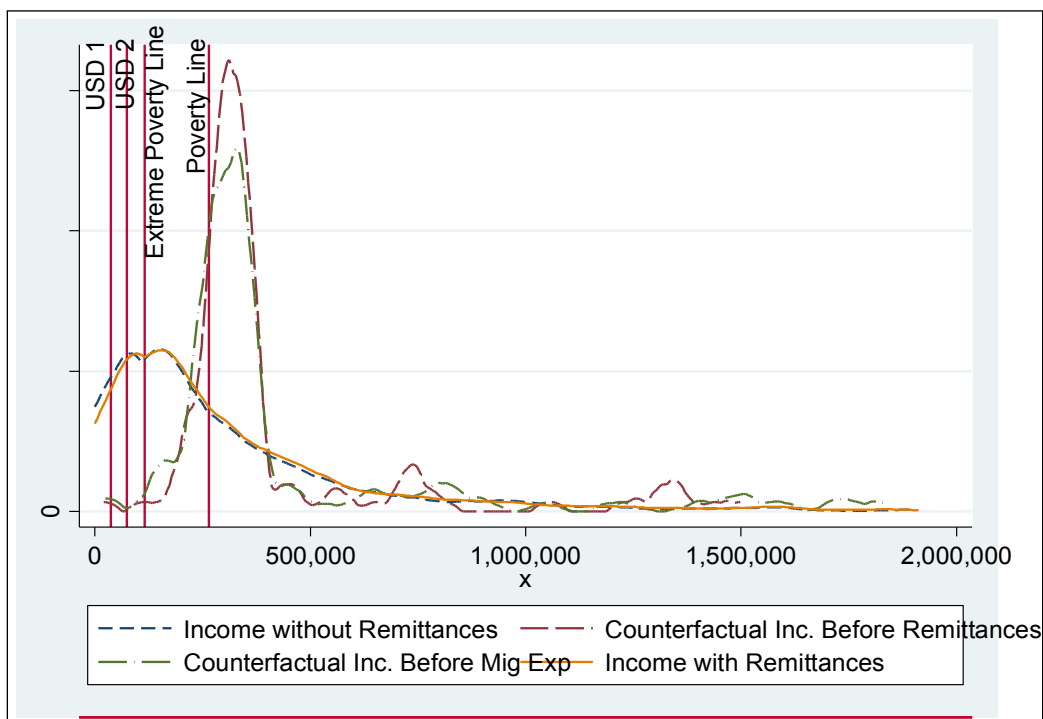
<sup>10</sup> By December 2008 the one and two dollar per day lines were equivalent to \$37,400 and \$74,800 monthly per person respectively, while the extreme poverty and poverty lines were \$116,292 and \$264,026 monthly per person. According to the official definition, the extreme poverty line represents the minimum amount required to meet one

remittances, and it also depicts the distribution of the counterfactual income among those receiving remittances and among those having migration experience. If counterfactual incomes were correctly describing the income that households would have had without migration experience or remittances, according to the figure, since households actually benefiting from migration and remittances are likely to have been located just around the poverty line before migration, then we should expect both migration experience and remittances to have the largest impact on the share of households under the poverty line, rather than those under the extreme poverty line or the US\$2 and US\$1 lines.

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person's food needs, and the poverty line also includes the amount required to satisfy other needs like housing, clothing, etc.

**Figure 8: Distribution of income before and after remittances and poverty lines**



Source: DOTM Colombian Household Survey (authors' calculations)

When we use the one and two-dollars per day lines (adjusting by PPP) and we analyse the income households would have without remittances, we find that households with migration experience would be between 2.4 and 3.2 per cent more likely to be under the US\$1 and US\$2 lines, respectively. Once we take remittances into account, households with migration experience become as likely to be under either of those lines as any other household. For households receiving remittances, we find no effect of remittances on the likelihood to be under the US\$1 or US\$2 lines.

When we use the national extreme poverty line, we find again that households with migration experience are more likely (by nearly 7 per cent) to be under the extreme poverty if they are not receiving remittances, but as above, they are as likely to be in extreme poverty once we take remittances into account. When we examine the group of households receiving remittances we find that they are as likely, with or without remittances, to be extremely poor.

A different picture emerges with the national poverty line cut off. In that case, both households with migration experience and that receive remittances would be as likely as the others to be poor when we consider only their income without remittances, but households with migration experience or that receive remittances would now be less likely to be poor once we take remittances into account. The estimates indicate that households with an absent migrant would be 14 per cent less likely to be poor, while those with a return migrant would be 9 per cent less likely to be poor. Households receiving remittances from relatives would be 14 per cent less likely to be poor, while on average, those receiving remittances from any source would be 12 per cent less likely to be poor. Table 9 presents the results of the impact of migration experience and remittances on poverty.

**Table 9: Effects of migration and remittances on poverty**

	ATT	Std. Err.	t	ATT	Std. Err.	t
	<b>Poverty without Remittances (US\$ 1 PPP)</b>			<b>Extreme Poverty without Remittances (Extreme Poverty Line)</b>		
<b>ME</b>	0.024	0.015	1.60	0.069	0.034	2.036**
<b>ME Absent</b>	0.003	0.024	0.12	0.037	0.041	0.88
<b>ME Returnee</b>	0.023	0.016	1.47	0.045	0.038	1.19
<b>RR Family</b>	0.027	0.027	1.01	0.062	0.054	1.13
<b>RR All</b>	0.016	0.027	0.58	0.040	0.051	0.78
	<b>Poverty with Remittances (US\$1 PPP)</b>			<b>Extreme Poverty with Remittances (Extreme Poverty Line)</b>		
<b>ME</b>	0.013	0.013	0.96	0.043	0.032	1.35
<b>ME Absent</b>	-0.013	0.031	-0.41	0.000	0.041	-0.01
<b>ME Returnee</b>	0.023	0.015	1.52	0.030	0.033	0.89
<b>RR Family</b>	-0.005	0.013	-0.36	-0.002	0.040	-0.06
<b>RR All</b>	-0.006	0.034	-0.18	-0.033	0.050	-0.66
	<b>Poverty without Remittances (US\$ 2 PPP)</b>			<b>Poverty without Remittances (Poverty Line)</b>		
<b>ME</b>	0.032	0.017	1.925*	-0.010	0.038	-0.26
<b>ME Absent</b>	0.006	0.032	0.20	-0.078	0.055	-1.42
<b>ME Returnee</b>	0.033	0.024	1.41	-0.078	0.055	-1.42
<b>RR Family</b>	0.021	0.021	0.98	-0.058	0.064	-0.90
<b>RR All</b>	0.017	0.028	0.61	-0.054	0.061	-0.90
	<b>Poverty without Remittances (US\$2 PPP)</b>			<b>Poverty with Remittances (Poverty Line)</b>		
<b>ME</b>	0.017	0.017	1.00	-0.044	0.043	-1.02
<b>ME Absent</b>	-0.014	0.045	-0.32	-0.140	0.050	-2.807**
<b>ME Returnee</b>	0.026	0.020	1.28	-0.085	0.041	-2.083**
<b>RR Family</b>	-0.011	0.023	-0.49	-0.143	0.064	-2.243**
<b>RR All</b>	-0.012	0.027	-0.44	-0.120	0.050	-2.399**

Source: DOTM Colombian Household Survey (authors' calculations)

For each household we use the cut offs previously described to determine whether or not that household would be under the poverty or extreme poverty lines. In the case of households receiving remittances we make the same calculation using their income with and without remittances, which gives an idea of whether households receiving remittances would be under the poverty lines if they were not receiving remittances.

These results highlight the importance of migration and remittances in reducing poverty and are in line with our interpretation of Figure 8. They also tally with previous estimates by Garay and Rodríguez (2005), who find that if remittances are not taken into account in household income, poverty and extreme poverty rates rise by 5 percentage points in the metropolitan area of Pereira (although by using an accounting approach in their study, Garay and Rodríguez may be overestimating the impact of remittances at the lower end of the income distribution). Using the 2005 Colombian Population Census, Cárdenas and Mejía (2009) show that about 16 per cent of

individuals in Pereira live in households with experience of migration. If we apply our impact estimates - no impact for extreme poverty, and 12 per cent for poverty - then remittances would only reduce poverty, and they would reduce it by about 1.9 percentage points at the most.

### **3.5 Impacts on savings, homeownership and access to financial services**

The results presented in Table 10 show that households with migration experience increase their monthly total and per-capita savings by \$34,000 (US\$17) and \$11,000 (US\$5.5), respectively. This is mostly due to the effect on households with a return migrant, which is about three times the size of the impact in households with an absent migrant. Remittances from relatives increase total and per-capita savings by \$24,000 (US\$12) and \$8,000 (US\$4) respectively; as do remittances from any source.

Owning a house tends to be the most important form of savings for most Colombian households. Although our cross section estimates show that both migration and remittances increase the probability of owning a house, the more accurate difference-in-differences estimates show that migration experience does not have a significant effect, while the effect of remittances, although still positive and statistically significant, is smaller than the one found with the cross section estimates. Households receiving remittances from a relative are 5 per cent more likely to own a house, while households receiving remittances from any source are 4 per cent more likely to own a house.

Our survey enables us to know whether any member of the household has an account in a financial institution, and whether they had one five years ago. We use this information to assess whether migration or remittances increase the probability that a household has an account in a financial institution. Cross section and difference in differences estimates of this effect are presented in Table 10. Neither our cross section nor our difference-in-differences estimators show any effect of migration or remittances on the probability of holding an account in a financial institution.

The next step is assessing whether migration or remittances increase the likelihood of households having a financial account for the purpose of establishing and running a business. The only effect we find is that according to our DD estimates, households receiving remittances from any source are nearly 5 per cent more likely to have an account that is used to fund a business.

### **3.6 Impacts on education**

Households that receive remittances are less credit constrained, and are therefore able to spend more on human capital formation, such as education and health services. Previous work by Medina and Cardona (2005) finds evidence supporting this hypothesis, and also suggesting higher enrolment rates in private education for remittance recipients, using data from a survey for the metropolitan area of Pereira collected in 2004, and from another LSMS survey at the national level collected in 2003. Cárdenas and Mejía (2009) cite additional evidence of positive effects in other Latin American countries, although there is important heterogeneity in the results across countries. The reduction in child labour is another channel through which remittances might affect human capital accumulation, increasing school attendance and performance, as found by Mansuri (2006).

**Table 10: Effects of migration and remittances on monthly savings, homeownership and access to financial services**

	ATT	Std. Err.	t	ATT	Std. Err.	t
	<b>Savings of Hhold (Colombian pesos)</b>			<b>Hhold with Account in Financial Institution</b>		
<b>ME</b>	34,010	12,316	2.761**	0.015	0.033	0.45
<b>ME Absent</b>	16,754	8,689	1.928*	0.018	0.047	0.37
<b>ME Returnee</b>	50,183	25,878	1.939*	0.032	0.034	0.94
<b>RR Family</b>	23,721	11,321	2.095**	0.021	0.054	0.39
<b>RR All</b>	21,209	9,863	2.15**	0.074	0.045	1.637*
	<b>Per-capita Savings (Colombian pesos)</b>			<b>Hhold with Account in Financial Institution (DD)</b>		
<b>ME</b>	10,975	5,193	2.113**	-0.011	0.021	-0.55
<b>ME Absent</b>	5,879	2,819	2.086**	0.005	0.036	0.15
<b>ME Returnee</b>	15,566	9,570	1.63	-0.030	0.029	-1.02
<b>RR Family</b>	8,253	3,285	2.512**	0.041	0.036	1.13
<b>RR All</b>	7,508	4,056	1.851*	0.017	0.030	0.56
	<b>Hhold Owns Housing</b>			<b>Hhold with Account for Credit to Fund Business</b>		
<b>ME</b>	0.090	0.028	3.259**	0.027	0.015	1.811*
<b>ME Absent</b>	0.108	0.033	3.242**	0.014	0.014	1.03
<b>ME Returnee</b>	0.087	0.037	2.372**	0.035	0.019	1.862*
<b>RR Family</b>	0.157	0.033	4.729**	0.030	0.019	1.56
<b>RR All</b>	0.136	0.042	3.262**	0.035	0.017	2.06**
	<b>Hhold Owns Housing (DD)</b>			<b>Hhold with Account for Credit to Fund Business (DD)</b>		
<b>ME</b>	0.015	0.021	0.72	0.003	0.018	0.19
<b>ME Absent</b>	0.038	0.026	1.46	-0.001	0.022	-0.05
<b>ME Returnee</b>	0.001	0.021	0.06	-0.002	0.027	-0.06
<b>RR Family</b>	0.049	0.023	2.173**	0.013	0.023	0.54
<b>RR All</b>	0.036	0.022	1.61	0.045	0.026	1.687*

Source: DOTM Colombian Household Survey (authors' calculations)

Similarly, Cox-Edwards and Ureta (2003) find that remittances reduce the probability of dropping out of the school to a larger extent than labour income growth in El Salvador, while Yang (2003) estimates that a 10 per cent increase in remittances leads to an increase of just over 10 per cent in the enrolment rates of students between 17 and 21 years of age in the Philippines.

However, as pointed by Katseli *et al.* (2006) and the World Bank (2006), migration alters family composition and means that children often grow up in single parent households, which can potentially have a negative effect on their school performance.

Migration might also affect school performance by changing children's expectations, depending on whether the migrant needed to have high levels of education or not in order to migrate, and have 'successful' experiences abroad. For example, Cárdenas and Mejía (2008) suggest that in

the case of Mexico, the successful experience of unskilled migrants might encourage younger individuals to prefer migrating than studying.

Finally, households with returned migrants - who may have a higher level of educational attainment and may also bring with them savings that could allow them to work less and spend more time at home with their children - might be expected to present better education and health indicators.

*Monthly total and per-capita expenditure on secondary and higher education*

To assess the overall impact of migration and remittances on the monthly expenditures of households on education, we first estimate their effects on the sub-sample of households with at least one member between 6 to 18 years old, which allows us to look at impacts on primary and secondary education expenditure. Since we do not have enough households in our survey sample to perform the same exercise for households with members 19 to 25, we repeat the exercise for households with members aged 6 to 25. The estimation for that sub-sample of households would give us an insight into the effects on expenditure on primary, secondary and higher education.

Table 11 shows the results of these two estimations. The panel at the top shows the results for households with at least one member between 6 to 18 years old, and the second panel shows them for households with at least one member aged between 6 to 25 years.

In the results for households with at least one member aged between 6 to 18 years, we find that households with return migrants spend nearly \$40,000 more on education, but do not find any other significant effect. For households with at least one member aged between 6 to 25 years, we find again a positive effect of migration, mostly in households with return migrants. The results show that households with experience of migration spend about \$34,000 more per month on education, while households receiving remittances spend between \$59,000 and \$77,000 more per month on education.

**Table 11: Educational factors**

	ATT	Std. Err.	t	ATT	Std. Err.	t	ATT	Std. Err.	t
	<b>Basic Education Expenditure (Colombian Pesos)</b>			<b>Per-capita Basic and Higher Education Expenditure (Colombian Pesos)</b>			<b>School Attendance (All)</b>		
<b>ME</b>	10,775	12,347	0.87	10,102	5,145	1.963**	-0.036	0.030	-1.20
<b>ME Absent</b>	11,579	10,164	1.14	16,289	7,823	2.082**	0.005	0.040	0.12
<b>ME Returnee</b>	39,036	14,628	2.669**	9,375	4,998	1.876*	0.001	0.046	0.02
<b>RR Family</b>	10,424	14,158	0.74	26,159	9,568	2.734**	0.010	0.039	0.25
<b>RR All</b>	3,476	12,338	0.28	21,746	10,460	2.079**	-0.030	0.036	-0.84
	<b>Basic and Higher Education Expenditure (Colombian Pesos)</b>			<b>% of Children Between 6 and 18 Years Attending School</b>			<b>School Attendance (Males)</b>		
<b>ME</b>	33,785	18,116	1.865*	-0.028	0	-1.02	-0.027	0.037	-0.74
<b>ME Absent</b>	45,737	32,085	1.43	-0.006	0	-0.27	0.035	0.048	0.74
<b>ME Returnee</b>	43,855	24,230	1.81*	-0.035	0	-1.32	-0.015	0.052	-0.28
<b>RR Family</b>	76,980	32,865	2.342**	-0.047	0	-1.13	0.010	0.054	0.18
<b>RR All</b>	59,130	29,713	1.99**	-0.048	0	-1.23	0.008	0.051	0.16
	<b>Per-capita Basic Education Expenditure (Colombian Pesos)</b>			<b>% of Children Between 6 and 25 Years Attending School</b>			<b>School Attendance (Women)</b>		
<b>ME</b>	3,009	3,230	0.93	-0.019	0	-0.61	-0.040	0.043	-0.95
<b>ME Absent</b>	4,342	3,064	1.42	0.006	0	0.17	-0.013	0.055	-0.23
<b>ME Returnee</b>	10,299	6,167	1.67*	-0.019	0	-0.51	-0.058	0.057	-1.02
<b>RR Family</b>	2,090	3,017	0.69	0.027	0	0.54	-0.012	0.063	-0.19
<b>RR All</b>	-239	2,801	-0.09	-0.001	0	-0.02	-0.011	0.047	-0.23

Source: DOTM Colombian Household Survey (authors' calculations)

When we use per-capita expenditure rather than total expenditure on education, we again find a positive effect in households with return migrants, but do not find any other significant effect on expenditure on basic education, and again, a positive and significant effect on basic and higher education expenditure for both migration experience and remittances. Migration experience increases per-capita expenditure on basic and higher education by \$10,000 per month (slightly more in households with absentees), while remittances increase it between \$22,000 and \$26,000 per month. This magnitude is just about one third that of total educational expenditure, a figure, it is worth noting, which is consistent with the size of households with migration experience (3.6 people per household with migration experience).

#### *School Attendance*

We also assess the impact of migration and remittances on school attendance for households with members aged 6 to 18 and with members aged 6 to 25. First, we do it at the household level by creating a variable equal to the share of individuals in the household in a specific age range (6-18 or 6-25) that attend school; and then we do it at the individual level for all individuals in those age ranges, and separately for males and females. We find no significant effect of migration experience, or remittances from any source, on school attendance in any of these analyses.



### 3.7 Impacts on health

Migration might affect health outcomes directly through remittances by enabling households to demand more and better health services, just as they do for education. As Hildebrant and McKenzie (2005) point out, migration may also give individuals and households knowledge and experience of foreign health habits and practices that could foster healthier behaviours at home. Nonetheless, they also note that by raising the opportunity costs of time for parents, migration might reduce breastfeeding and the application of vaccines in a timely fashion.<sup>11</sup>

#### *Total and per-capita health expenditure and health perception*

Table 12 presents the matching estimates of the effect of migration experience and remittances on total and per-capita health expenditure. Migration experience has a positive effect on total health expenditure per month of nearly \$29,000, mostly driven by the effect on households with return migrants, while remittances from any source increases total health expenditure by nearly \$49,000 per month. The impact of migration on per-capita health expenditure is \$7,000 per month, and that of remittances is around \$11,000 per month. Finally, we found no overall effect of migration experience on people's perception of their health, but only a negative effect on individuals living in a household with an absent migrant: they are almost 4 per cent less likely to perceive that their health is good.

As shown in the table, this result is explained by the answers given by female survey respondents, who are almost 5 per cent less likely to perceive that their health is good. A similar result is found for households receiving remittances: their recipients are between 4-6 per cent less likely to perceive they have good health, where again, females are driving this result, since females in households receiving remittances are between 5-8 per cent less likely to perceive they have good health. This negative result for females might be linked to emotional distress caused by the absence of migrants, which may have knock-on impacts for their physical health. As some stakeholders observed, members of sender households can suffer from emotional problems if they are concerned about the welfare of their relatives abroad (especially those who may have migrated illegally). Similarly, living in a situation of family fragmentation might also have an impact on the household members' health status.

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<sup>11</sup> Further evidence is also presented in Cárdenas and Mejía (2009).

**Table 12: Health factors**

	<b>ATT</b>	<b>Std. Err.</b>	<b>t</b>
<b>Health Expenditure of Hhold (Colombian pesos)</b>			
<b>ME</b>	28,572	14,331	1.994**
<b>ME Absent</b>	18,272	17,035	1.07
<b>ME Returnee</b>	56,691	20,871	2.716**
<b>RR Family</b>	53,825	33,726	1.60
<b>RR All</b>	49,120	22,818	2.153**
<b>Per-capita Health Expenditure (Colombian pesos)</b>			
<b>ME</b>	7,435	2,835	2.622**
<b>ME Absent</b>	2,986	3,840	0.78
<b>ME Returnee</b>	13,289	4,711	2.821**
<b>RR Family</b>	11,357	4,739	2.396**
<b>RR All</b>	11,570	4,527	2.555**
<b>Good health (All)</b>			
<b>ME</b>	-0.023	0.017	-1.35
<b>ME Absent</b>	-0.039	0.017	-2.327**
<b>ME Returnee</b>	0.009	0.019	0.48
<b>RR Family</b>	-0.058	0.020	-2.882**
<b>RR All</b>	-0.046	0.016	-2.895**
<b>Good health (Males)</b>			
<b>ME</b>	-0.016	0.021	-0.77
<b>ME Absent</b>	-0.025	0.021	-1.17
<b>ME Returnee</b>	0.018	0.023	0.78
<b>RR Family</b>	-0.030	0.027	-1.10
<b>RR All</b>	-0.029	0.026	-1.15
<b>Good health (Females)</b>			
<b>ME</b>	-0.032	0.019	-1.662*
<b>ME Absent</b>	-0.048	0.019	-2.527**
<b>ME Returnee</b>	0.006	0.026	0.25
<b>RR Family</b>	-0.073	0.026	-2.785**
<b>RR All</b>	-0.056	0.022	-2.504**

Source: DOTM Colombian Household Survey (authors' calculations)

### **3.8 Impacts on quality of life and living standards**

Measuring quality of life usually requires a comprehensive examination of living standards and habits, and trying to measure differences in these standards between migrant and non migrant households, which is not an easy task. In addition, there are multiple dimensions which have an important impact on the quality of life but are very difficult to account for, such as the influence of social networks.

The life satisfaction approach provides a relatively simple way to measure quality of life.<sup>12</sup> Following this type of research, our survey included the following question: “Considering all aspects, how satisfied are you with your life currently? Use a 1 to 10 scale, where 1 is unsatisfied and 10 is satisfied.” To assess the effect of migration experience and remittances on life satisfaction, we define three dummy variables (these take a value of one when: (i) the individual answered 6 or more, (ii) the answer was 8 or more; (iii) the answer was 3 or less). These three variables indicate whether individuals are on average satisfied, if they are very satisfied or very unsatisfied respectively, with their lives.

Table 13 shows the results of our matching estimates. Migration experience makes individuals just over 6 per cent more likely to feel very satisfied (if they answered 8 or more in our life satisfaction question) mainly due to its positive effect on women living in households with returned migrants, while remittances from relatives make their beneficiaries between 9-11 per cent more likely to feel very satisfied, here again, due to their effect on women. Neither migration experience nor remittances have an effect on the whole population’s average life satisfaction (answering 6 or more) or dissatisfaction (answering 3 or less), although men living in households with an absent migrant are about 4 per cent more likely to feel not satisfied.

**Table 13: Life satisfaction**

	Males and Females		Males		Females	
	ATT	<i>t</i>	ATT	<i>t</i>	ATT	<i>t</i>
<b>Average Overall Life Satisfaction of Household (6-10)</b>						
<b>ME</b>	-0.027	-1.05	-0.019	-0.49	-0.034	-1.28
<b>ME Absent</b>	-0.007	-0.30	-0.023	-0.56	-0.002	-0.06
<b>ME Returnee</b>	-0.032	-0.94	-0.012	-0.25	-0.058	-1.39
<b>RR Family</b>	-0.007	-0.17	0.002	0.03	-0.010	-0.20
<b>RR All</b>	-0.019	-0.52	0.022	0.39	-0.035	-0.90
<b>Household Very Satisfied (8-10)</b>						
<b>ME</b>	0.063	2.00**	0.046	0.66	0.069	1.51
<b>ME Absent</b>	0.074	1.77*	-0.032	-0.37	0.078	1.54
<b>ME Returnee</b>	0.077	2.30**	0.052	0.88	0.090	1.89*
<b>RR Family</b>	0.113	2.73**	0.125	1.37	0.108	2.21**
<b>RR All</b>	0.051	1.34	0.076	0.97	0.044	0.82
<b>Household Not Satisfied (1-3)</b>						
<b>ME</b>	0.020	1.39	0.031	2.03**	0.016	0.88
<b>ME Absent</b>	0.010	0.64	0.041	1.66*	-0.002	-0.09
<b>ME Returnee</b>	0.021	1.21	0.023	1.26	0.025	1.10
<b>RR Family</b>	-0.014	-0.63	0.015	0.59	-0.033	-0.88
<b>RR All</b>	0.002	0.16	0.009	0.58	-0.003	-0.17

Source: DOTM Colombian Household Survey (authors’ calculations)

<sup>12</sup> This approach has now been widely applied, as documented in Frey and Stutzer (2002) and van Praag (2007), among others. Applications in which the approach is used to value public goods have become common, as it has been shown by Frey *et al.* (2004). For the foundations of the approach, see Layard (2005), which presents evidence from the neuroscience supporting the fact that this apparently subjective method actually has strong objective grounds.

### 3.9 Impacts on household structure and gender roles

All interviewed stakeholders agree that international migration has had an impact on family structure in Colombia. They claim that since the largest migratory wave is very recent, only some members of the core (or nuclear) family are likely to have left the country, thereby directly affecting the structure of the household. We use our data to assess how migration affects family structure.

#### *Family structure*

We define the variable 'core family', which is equal to one when the household members include both parents and at least one child (in the case of a widowed parent the variable is also one). Whenever the absent migrant is the spouse of a household member or is the parent of a child in the household, the value is zero.

Table 14 presents the results of this exercise. Households with migration experience are around 8 per cent less likely to keep their core family together, and interestingly enough, households with return migrants are even less likely (just over 10 per cent) to keep it together. This result suggests that some people who return are in a situation in which it is even more difficult to keep their core family together than households who have an absent migrant. This finding is discouraging for those who believe that the separation brought about by international migration is only temporary. It may well be that the longer the period of separation due to migration, the more difficult it can be for the core family to reunite later on.

Households receiving remittances also appear to be more likely to have their core families split, particularly when these are sent by relatives; although this is less surprising since several of the households receiving remittances from relatives are actually receiving them from a member of the core family. We extend the results in order to look at the situation of family fragmentation ignoring information that is available from the survey in the case of households with migration experience (which complete a more detailed questionnaire). In this case, which we label core family\*, we again find negative effects of both migration experience and remittances, even though they are of smaller magnitude, and not significant in the specific cases of households with either absent or return migrants, and for households receiving remittances from any source. These results give additional support to the conclusion that both migration experience and remittances cause family fragmentation, though perhaps not to the extent that might have been expected by stakeholders.

**Table 14: Family structure**

<b>Core Family</b>		
	<b>ATT</b>	<b>t</b>
<b>ME</b>	-0.079	-3.768**
<b>ME Absent</b>	-0.071	-1.777*
<b>ME Returnee</b>	-0.103	-3.121**
<b>RR Family</b>	-0.146	-3.554**
<b>RR All</b>	-0.061	-2.172**
<b>Core Family*</b>		
	<b>ATT</b>	<b>t</b>
<b>ME</b>	-0.060	-2.854**
<b>ME Absent</b>	-0.018	-0.46
<b>ME Returnee</b>	-0.049	-1.46
<b>RR Family</b>	-0.108	-3.378**

RR All	-0.044	-1.52
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**Source:** DOTM Colombian Household Survey (authors' calculations)

### *Gender roles*

As pointed out by Katseli *et al.* (2006), the effects of migration depend on who migrates in the household. If a male household head migrates, then migration might empower females if they take over household decisions and responsibilities. Equally, if the migrant is a woman, migration to a more developed country may offer them more equal opportunities in terms of education, work positions, and potentially, in terms of cultural acceptance and openness.

Now we assess the effect of migration and remittances, by gender, on the type of tasks performed by household's members. The results are presented in Table 15. The activities we assess are cooking, cleaning house, home restoration, water collection, firewood collection, growing or collecting crops, purchases for household, child care, taking care of the ill or retired, resting or recreation, attending social commitments, community work and other activities. We find significant effects of migration experience or remittances on cooking, cleaning house, child care, attending social commitments and other activities.

**Table 15: Tasks performed by men, women, and both genders**

	Males and Females		Females		Males	
	ATT	t	ATT	t	ATT	t
<b>Cooking</b>						
<b>ME</b>	-0.001	-0.06	-0.017	-0.64	0.022	1.799*
<b>ME Absent</b>	-0.005	-0.31	-0.025	-1.06	0.007	0.46
<b>ME Returnee</b>	-0.011	-0.62	-0.046	-1.41	0.023	1.30
<b>RR Family</b>	-0.005	-0.19	-0.038	-1.18	0.006	0.41
<b>RR All</b>	0.000	0.02	-0.035	-1.36	0.018	1.44
<b>Cleaning Housing</b>						
<b>ME</b>	-0.043	-2.605**	-0.055	-2.588**	-0.022	-1.18
<b>ME Absent</b>	-0.044	-2.59**	-0.057	-2.369**	-0.039	-1.54
<b>ME Returnee</b>	-0.048	-2.228**	-0.082	-2.698**	-0.013	-0.48
<b>RR Family</b>	-0.039	-1.49	-0.051	-1.781*	-0.050	-2.443**
<b>RR All</b>	-0.022	-1.11	-0.042	-1.54	-0.023	-0.97
<b>Child Care</b>						
<b>ME</b>	0.007	0.41	0.020	0.84	-0.011	-0.31
<b>ME Absent</b>	-0.005	-0.41	-0.007	-0.69	-0.005	-0.31
<b>ME Returnee</b>	0.035	2.767**	0.030	1.892*	0.040	1.858*
<b>RR Family</b>	-0.035	-1.664*	-0.033	-1.61	-0.046	-1.30
<b>RR All</b>	-0.020	-1.03	-0.023	-1.06	-0.027	-0.88
<b>Attending Social Commitments</b>						
<b>ME</b>	-0.010	-0.71	-0.018	-1.06	-0.002	-0.10
<b>ME Absent</b>	-0.001	-0.09	-0.011	-0.67	0.015	0.63
<b>ME Returnee</b>	0.004	0.20	0.005	0.28	0.010	0.31
<b>RR Family</b>	0.026	1.42	-0.004	-0.17	0.069	2.084**
<b>RR All</b>	0.024	1.722*	0.006	0.36	0.056	1.957**
<b>Other Activity</b>						
<b>ME</b>	-0.015	-1.32	-0.022	-1.26	-0.008	-0.55
<b>ME Absent</b>	-0.029	-2.919**	-0.044	-4.205**	-0.012	-0.71
<b>ME Returnee</b>	-0.006	-0.52	-0.012	-0.80	0.000	0.02
<b>RR Family</b>	-0.039	-2.806**	-0.049	-3.662**	-0.021	-0.98
<b>RR All</b>	-0.028	-2.734**	-0.039	-2.653**	-0.014	-0.80

Source: DOTM Colombian Household Survey (authors' calculations)

As shown above, males with migration experience are more likely to spend more time cooking, and the magnitude and significance of the estimates suggests that those that spend more time cooking are return migrants. This seems reasonable, since it is likely that their experiences while abroad (where they are often living alone), encourage them to engage in activities like cooking.

Females living in households with migration experience are less likely to spend time cleaning the house, which implies that their attitude towards this activity changes while migrants are abroad, and persists once they return. Males and females receiving remittances from relatives also report being less likely to spend time cleaning the house.

Both males and females living in a household with return migrants spend more time taking care of children, although those living in a household that receives remittances spend less time. To further explore this result we perform a more detailed study of household structures. We estimate again the propensity score but now we include two additional dummy variables. One is equal to one if there are children aged 0 to 12 and members aged between 20 and 30 years old,

and zero otherwise; the other is equal to one if there are children aged 0 to 12 and members aged 30 or older. We get estimates for the whole sample of households, and also conditioning only to households with children 0 to 12. The results are presented in Table 16.

**Table 16: Adults with children in the household**

	Migration Experience			Remittances	
	All	Absent	Returnee	Family	All
<b>Unrestricted</b>					
Children 0-12 * Members 20-30	-7.46E-06	0.0079	-0.0002	0.0051	0.0282
	0.000	1.36	-0.04	2.36**	2.08**
Children 0-12 * Members 30+	-0.013	-0.0084	-0.0088	-0.0032	-0.0212
	-1.490	-1.58	-1.57	-1.98**	-1.81*
<b>Restricted to Households with Children 0-12</b>					
Children 0-12 * Members 20-30	0.0135	0.0119	2.23E-04	8.67E-08	3.51E-07
	1.6	2.72**	0.29	3.62**	3.08**
Children 0-12 * Members 30+	0.0036	0.0042	-6.32E-04	8.12E-09	4.30E-08
	0.3	0.86	-0.48	1.31	0.74

**Source:** DOTM Colombian Household Survey (authors' calculations)

In both the unrestricted and the restricted estimations we find that there are more members aged 20 to 30 in the households that receive remittances, but only in the unrestricted estimation we find that there are more members 30 and older. If household members aged between 20 and 30 are relatively less likely to take care of children than engage in other activities - even if members aged 30 and older are equally likely to take care of children in households receiving remittances and those that do not - the differences found in the demographics of household might be enough to explain the negative sign found in child care for households that receive remittances. Note also that we found previously that households with migration experience and those that receive remittances spend more on education, and in particular, on higher education. Thus, education might be among the activities that 20 to 30 years old get involved in and that compete with child care.

Migration experience does not affect the likelihood of attending social commitments for either males or females, but males receiving remittances are more likely to attend social commitments. Finally, both households with an absent migrant and those that receive remittances are less likely to spend time on other activities.

### 3.10 Summary of impacts

It appears that the set of households that gain the most from migration and remittances are those with return migrants. Although their income does not increase, their total levels of expenditure, and specifically their expenditures on home products, recreation, health and education (both basic and higher, being the only group with migration experience that increases its expenditure on basic education) do increase. This might be the result of savings that they bring back when they return home, which is consistent with their higher savings and expenditure levels, income levels remain comparable to households without migration experience. Their

poverty levels, considering only their income without remittances, does not seem to be affected by their status as return migrants, but once we consider the remittances they receive, their likelihood of being in poverty is reduced. They are more likely to feel very satisfied with their life, and spend more time taking care of children. In addition, this is the only group of households with migration experience in which females do not self report their health to have worsened. Nonetheless, the families of households with return migrants are more likely to be fragmented than households without migration experience.

Households with absent migrants share many of the characteristics found in those with return migrants, and in addition see a positive effect on their income levels. However, we find a few results unfavourable to males in absent migrant households: they are more likely to be unemployed and to feel very unsatisfied with their lives. In addition, these households do not increase their expenditure on health, which is of particular concern given that females living in these households are more likely to self report being in bad health.

Households receiving remittances differ to those with return migrants in that their males are more likely to be unemployed, their females report being in bad health and they spend less time taking care of children. In the aggregate, however, households receiving remittances improve their access to financial services to fund businesses.

When we turn to look across all the households with migration experience, we see that, on average, migration appears to reduce their likelihood of being in poverty. Households with migration experience would be more likely to fall under the US\$2 a day and extreme poverty lines if they did not have remittances, signalling the importance of remittances in reducing their vulnerability.

We find increases in per capita expenditure on education in households with migration experience, but we do not find increases in school enrolment, which might be a consequence of single parenthood (to the small extent that migration appears to cause this) or a lack of parental authority in the absence of the migrant, one of the potentially negative consequences of migration in the Colombian case. However, higher expenditures in education can signal greater concern with the quality of education, maybe through an increase in enrolment in private as opposed to public schools.

## **4. Conclusions and policy recommendations**

The evidence collected in this paper shows that most Colombian migrants are concentrated in a few destination countries, with around 35 per cent currently living in the US, followed by 23 per cent in Spain and 20 per cent in Venezuela. While different datasets produce different results, Colombian absent migrants tend to have more years of schooling than the average citizen (around 12 years compared to 9 years). In addition, 30 per cent of migrants over the age of 25 have tertiary education, compared to just 5 per cent of the population in Colombia. Also, both absent and return migrants are more likely to be female than male.

Remittances have become an increasingly important source of financial support for many Colombian households. Our data indicate that around 55 per cent of absent migrants send remittances, and that monthly per-capita income is increased by up to US\$62 in households receiving remittances from any source (average monthly per-capita income in Colombia is US\$228).



While it is sometimes argued that migration and remittances can increase dependency among household members left behind, our findings indicate that there is no significant impact on labour force participation in households with migrants. However, remittances do appear to have a negative effect on labour force participation. According to our results, individuals (and particularly females) in households receiving remittances from any source are nearly 4 per cent less likely to participate in the labour market.

Migration and remittances affect expenditure patterns in migrant households in Colombia. Having a migrant in the household (either absent or returned) increases total per capita expenditure by nearly US\$35 per month while households that receive remittances increase per capita expenditures h somewhere in the range between US\$37 and US\$49 per month. Households that receive remittances from a family member are 5 per cent more likely to own a home, while households receiving remittances from any source are 4 per cent more likely to own a home.

Migration appears to increase household monthly per-capita savings by US\$6, while remittances from relatives increase per-capita monthly savings by US\$4. However, migration and remittances do not appear to increase the probability of households holding a savings account with a financial institution. Migration and remittances increase spending on education but do not seem to have an impact on levels of school attendance. Migration increases total spending on health by around US\$14 per month (particularly in households with return migrants), while remittances from any source increase total health expenditure by about US\$24 per month. It is interesting that this increased expenditure does not appear to have changed the perceptions of members of migrant households about their health status. Indeed, individuals living in a household with an absent migrant are almost 4 per cent less likely to state that their health is good. This opinion seems to be particularly prevalent among female household members.

Our data suggest that both migration and remittances are connected to family fragmentation. Households with migration experience are around 8 per cent less likely to keep their immediate families together, with this effect particularly pronounced in the sub-group of households with return migrants, who are 10 per cent less likely to do so. More encouragingly, it appears that both men and women living in a household with return migrants are more likely than those living in other types of household to spend time taking care of children living in the household, although receiving remittances seems to have the opposite effect.

## **Policy recommendations**

At present, many Colombians are working abroad illegally, which prevents them from migrating with their whole families, and once abroad, prevents them from visiting them due to the risk of not being able to migrate again. Formal circular migration programmes could therefore help to capitalise several of the benefits of international migration and avoid various costs of illegal migration which presumably include higher levels of family fragmentation, the lack of transferability of new knowledge, and human rights abuses.

Colombia has concluded some international agreements to promote circular migration, although their scope is currently very limited. There is one with Spain, which until recently had just 400 beneficiary workers and organised some workshops on labour and communitarian training and

the productive use of remittances. There is another with Canada in the meat processing industry.<sup>13</sup>

As argued by Naik *et al.* (2008), circular migration programmes can be extremely valuable for migrant sending countries, since it allows migrants to work formally for a number of months in a foreign country while still having incentives to return home. Migrant beneficiaries of these programs have been found to remit more and to return home with savings and new knowledge, which fits with the positive findings we derived regarding return migration's development impacts in the previous section. As discussed by Chappell and Glennie (2009), circular migration has been used by some African countries to promote 'brain gain', that is, the return of skilled workers to their home countries.

According to our results, households with return migrants are the ones with better results when compared either to households with absent migrants or without migration experience, thus, the objective evidence provided in this paper suggests that it may well be desirable to encourage absent migrants to return.

Since the illegal status of many Colombian absent migrants constrains their ability to return home either temporarily or permanently, any policy legalising their status should seek to improve welfare among households with migration experience and increase the opportunities for families to reunite. Given that the legal status of migrants is decided by host countries, it is up to the Colombian government to promote agreements with those countries to grant its migrants temporary amnesties, which ideally would allow them to have residence, in the case of the United States, or to hold what Katseli *et al.* (2006) call a 'Smart Visa' (such as a visa allowing circular migration, multi-entry, etc). Previous evidence provided by Gaviria (2004), and Medina and Posso (2009), shows not only that Colombian migrants in countries like the United States are positively selected, but also that return migrants are negatively selected; that is, the most able Colombians are those most likely to leave the country, and are less likely to return. The Colombian government should therefore seek to facilitate the return of the most skilled migrants by the establishment of temporary return programs targeted to them.

In the meantime, the government could provide Colombian current and potential migrants with information regarding the legal framework concerning labour rights and duties in their host countries, to enable them to exercise their rights more effectively. As the experience of the Philippines has shown, this can allow migrants to gain higher wages in the long run.

Also, the promotion of a more development-friendly set of requirements for Colombian migrants in their main destination countries would help to expand migration opportunities to people at the lower end of the income distribution, hence leveraging the distributive impact of migration and remittances, providing an additional guarantee against income losses, and adding a channel of mobility to those currently available to the poorest in Colombia.

Policymakers in Colombia should also seek to make better use of agencies that recruit migrant workers (and particularly private sector organisations) which could be playing a key role in increasing the opportunities available to Colombian labour migrants in other countries. At present, a lack of regulation and enforceability make these agencies unreliable guarantors of migrant rights, and simultaneously, diminishes the incentives of the private sector to provide services in that field. However, where these agencies are carefully regulated they appear to be

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<sup>13</sup> See Naik *et al.* (2008), which recommends that the cost-effectiveness of these programs should be carefully analysed, taking into account that in some cases, there is a share of the remittances sent by migrants in these programs that is retained by the governments to cover administrative costs, as it is the case with agreements between Caribbean countries and Canada.

more effective, such as in countries like Philippines and Vietnam. As highlighted by Naik *et al.* (2008), the number of private recruitment agencies in the Philippines went from a few in 1975 to thousands 10 years later, as the number of Philippine migrant workers in the Middle East increased from about 1,500 to 300,000.<sup>14</sup> Meanwhile, Nguyen *et al.* (2009) report that from 2002, when labour export became a government strategy in Vietnam, to 2009, the number of labour export enterprises increased massively in line with the growth of labour migration, with an average of more than 70,000 workers being sent abroad annually.<sup>15</sup> In both of these countries, there is an awareness of the need to monitor and regulate these agencies in order to protect migrants during all stages of their migration process, and to prevent labourers from becoming illegal migrants.

The Colombian National Government has assigned this task to the SENA, which can both assess the labour needs in the main destination countries, and also provide the required training for the positions available abroad to potential Colombian migrants.

Finally, governments should be aware that decisions about the use of remittances are exclusively private, and that policymakers can only provide a friendly environment for their investment. Policies designed to promote a more efficient use of remittances, like training remittance senders and recipients on the use of financial services, are more likely to increase the amount of money remitted and, by using the less expensive channels, actually received by their recipients. According to our survey, nearly 90 per cent of Colombian migrants remit their money through formal channels. Increasing the access of financial institutions and reducing the costs associated with these services should continue to be an important component of the policy agenda.

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<sup>14</sup> In addition, the annual revenue of 1200 licensed recruitment agencies, operating in the Philippines in 2004, was over US\$400 million. See Martin (2006), quoted by IOM (2008).

<sup>15</sup> A similar experience has taken place in Sri Lanka. See Gunatilleke (1991), quoted by IOM (2008).

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## Appendix A: Survey sampling strategy

Table 17 shows some basic information about the population and the number of households (with migration experience) per metropolitan area. According to the Colombian 2005 Population Census, almost 3 per cent of all households (and nearly 4 per cent of urban households) have had experience of migration. Of the total number of households with migration experience, 65 per cent live in the main 13 metropolitan areas, and 86.4 per cent of those in the 13 metropolitan areas live in Bogotá, Medellín, Cali, Barranquilla, Pereira and Manizales.<sup>16</sup>

As a result of this distribution, our sampling method included surveys collected in these six metropolitan areas, where households with migration experience represent just over 5 per cent of all households. We added Cúcuta (chosen probabilistically within the group of the other metropolitan areas) to the survey in order to improve the statistical robustness of the exercise. Since the main 13 metropolitan areas have a high incidence of international migration when compared with smaller urban areas, and even more when compared to rural areas, and additionally, collecting data in smaller urban areas or rural areas would be considerably more expensive than it is in the main metropolitan areas, we believe that the areas chosen will let us learn the key aspects of international migration in Colombia at reasonable costs.

The following steps summarise the sampling strategy adopted to collect the data. Within each metropolitan area we randomly selected a section, with a probability of selection proportional to the share of households with migration experience in each section, according to 2005 Colombian Population Census. Within each section, we selected blocks of households again with probability of selection proportional to the share of households with migration experience in each block, and finally, within each block we selected the same number of households with migration and without migration experience. All the surveys were collected between October 31 and December 9 in 2008. The total sample consists of 1200 households with complete information.<sup>17</sup>

Households determine the household head (HH), usually pointing to the person with the highest earnings in the household, or the oldest member of the household. In our survey, the interviewer asks the household head to answer the questionnaire, but if the household head is not available, he or she asks for a person 18 or older who knows household members and migrants.

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<sup>16</sup> The other metropolitan areas are Bucaramanga, Cartagena, Cúcuta, Ibagué, Pasto, Montería and Villavicencio.

<sup>17</sup> 1595 households were interviewed, but 395 households either provided incomplete information (1 household), declined to answer (273 households) or were absent at the time of the interview (105 households).



**Table 17: Sampling strategy**

<b>Metropolitan Area</b>	<b>No. of Municipalities</b>	<b>No. of Households (A)</b>	<b>No. of Households with Migrants (B)</b>	<b>(B)/(A)</b>	<b>Total Population (C)</b>	<b>No. of Migrants (D)</b>	<b>(D)/(C)</b>	<b>% of Blocks with Migrants</b>
<b>Bucaramanga</b>	4	266,150	7,823	2.9%	1,002,852	11,355	1.1%	46.5%
<b>Barranquilla</b>	2	359,863	13,158	3.7%	1,565,382	20,558	1.3%	45.3%
<b>Cali</b>	2	579,692	38,582	6.7%	2,153,825	60,060	2.8%	73.6%
<b>Cúcuta</b>	4	184,401	5,343	2.9%	738,314	8,921	1.2%	38.5%
<b>Manizales</b>	2	114,686	5,437	4.7%	408,596	7,602	1.9%	62.0%
<b>Medellín</b>	10	896,113	35,493	4.0%	3,294,649	52,896	1.6%	62.3%
<b>Pereira</b>	4	190,296	19,287	10.1%	693,957	30,883	4.5%	78.9%
<b>Bogotá-Soacha</b>	2	2,036,472	53,060	2.6%	7,138,856	77,358	1.1%	43.2%
<b>Cartagena</b>	1	206,634	5,922	2.9%	892,163	9,127	1.0%	37.1%
<b>Ibagué</b>	1	136,441	3,136	2.3%	490,976	4,357	0.9%	38.3%
<b>Montería</b>	1	84,578	782	0.9%	379,249	1,152	0.3%	15.4%
<b>Pasto</b>	1	96,364	1,234	1.3%	379,698	1,705	0.4%	25.6%
<b>Villavicencio</b>	1	102,795	1,781	1.7%	377,247	2,507	0.7%	27.9%
<b>Total 13 areas</b>	35	5,254,485	191,038	3.6%	19,515,764	288,481	1.5%	48.7%
<b>Rest of the Country</b>	1,079	5,474,578	105,022	1.9%	21,659,089	174,198	0.8%	24.5%
<b>Total</b>	1,114	10,729,063	296,060	2.8%	41,174,853	462,679	1.1%	34.3%

Source: SEI (2008) based on Colombian 2005 Population Census

## Appendix B: Methodology

Below we present the methodology and the results of evaluating the impact of having experience of migration or receiving remittances on a set of household outcomes. As has been well documented elsewhere, households with members that migrate are a self-selected subset of the whole population. Selection takes place according to household characteristics as well as conditions at home and abroad at the moment of migration. In addition, according to our definition, households with migration experience are those in which a former household member left the country (regardless of whether they are still absent or have returned). It might also be the case that the household with migration experience has one household member absent and another returned. This means that there is selection within the household of the person who leaves, and across households, within those who migrate there is a sub-sample that returns.

### *Identification strategy*

We use propensity score matching methods to estimate the impact of migration experience and remittances on household outcomes.<sup>18</sup> The key identifying assumption of this method is the independence assumption, according to which, given a set of variables,  $X$ , either the outcomes do not depend on migration experience or remittances, or any difference between the outcomes of households with and without migration experience (or receiving remittances) do not depend on the household having migration experience (or receiving remittances).<sup>19</sup>

The first part says that for people with similar characteristics,  $X$ , the outcome observed for those without migration experience is similar to the one that would have been observed for those with migration experience had they not have had migration experience; and similarly for receiving remittances. The second part only requires that on average, the outcomes would have been similar.

As noted by Heckman et al. (1999), the matching methods assumes in our case that the decision to migrate is made only on the basis of a set of variables  $X$ , and rules out the possibility of selection based on characteristics observed by the population of interest but not by the economist, like any potential gain of migration. It is also consistent with the possibility that either potential gains of migration do not vary across people, or that if there is any variation in those gains, that individuals do not decide whether to migrate on the basis of those gains.

Note that if potential gains of migration do not vary across people, our effects would be consistent with several situations that people face at the moment to decide whether to migrate. Suppose we have two identical individuals, but one with (unobserved) relatives and the other without relatives in other country, based on which the former migrates while the latter does not. Then, our estimate would be unbiased as long as the outcome observed for these two individuals, had the former not migrated (that is, if neither of them migrated), were similar.

Now suppose both individuals have relatives in the chosen destination country, but they might have potential differences in the gains from migrating. In this case, our estimates would also be unbiased as long as the decision to migrate did not depend on that potential difference in gains from migration. This is a likely situation, since there is a considerable amount of uncertainty concerning the magnitude of the gain at the moment that the decision to migrate or not is made. For two otherwise identical people, as long as that potential difference is not exaggerated, it is

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<sup>18</sup> We evaluate the impact of migration on households with migration experience, that is, our parameter of interest is the treatment on the treated,  $\Delta = E(Y_1 - Y_0 | D=1, P(X))$ . Our estimation of  $\Delta$  is made only on the support of  $X$  for which we find both treatment and comparison population, thus satisfying the balancing property.

<sup>19</sup> See Heckman, LaLonde and Smith (1999) and Heckman, Ichimura and Todd (1997, 1998)

very likely that the decision to migrate would finally depend on concerns different than the gap in the gains.

To obtain impact through matching estimators, it is essential to correctly specify the probability that a household experiences migration (and/or receives remittances). When we study the effects of migration experience, our dependent variable is equal to one if the household has a former member who left the country in the last ten years, living currently in other country, that is, if the household has an absent migrant in other country, or if the household has a member who lived in other country for at least three months and is currently living in the household, that is, if the household has a returnee. According to this definition, our set of  $X$  variables should be conformed of predetermined variables before migration took place. Nonetheless, since our data is a cross section collected in 2008, we do not have self-reported data at the moment the household became a household with migration experience, that is, at the moment migration of the household member took place, which could have happened up to ten years ago.

Asking interviewed households about their situation several years ago is a common practice in this type of survey but is not always useful as the interviewee may have trouble answering retrospective questions. Our survey asked whether current household members had lived in this household five years ago, whether they were working, taking care of children etc., and how much money they earned. We also asked current household members whether migrant members were working, taking care of children, and how much were they earning, just before they left the country. We also know the migrant's age and education.

Not entirely surprisingly, there were very high non response rates for the question about people's earnings five years ago. Finally, we have information of former household members not living in the household currently. We use this retrospective information to get difference in difference matching estimators of labour force participation, unemployment, home ownership, financial access (having a bank account and having an account for credit to fund a business). Difference-in-differences matching estimates have been proven to perform very well, and definitely better than the cross section estimates, when compared to experimental estimates in several settings.<sup>20</sup>

The setting in which we apply our matching estimators has several strengths. We use the same survey and homogeneous definitions of all our variables and outcomes for the whole sample, households in our survey share the same labour market, we can control for several variables like retrospective labour participation, home ownership, access to land for business, and access to the financial sector, that are key to correct for the possibility of having positive selection in our sample, that is, the possibility that for example, the better off households were the ones with migration experience. Such positive selection might arise in our context due to the barriers to migrate for Colombians.<sup>21</sup> In addition, for the cases in which we can get difference-in-differences estimators, we can obtain unbiased estimates whenever the bias, conditional on  $X$ , does not change over time.

Previous work by Akee (2008) and McKenzie et al. (2006) among others, has addressed the specific question of whether selection into migration is based on observable or unobservable variables. Nonetheless, their specific cases are unlikely to resemble the Colombian case, in

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<sup>20</sup> See for example Heckman, Ichimura and Todd (1997, and Heckman, Ichimura, Smith and Todd (1998), where they find that difference-in-difference matching estimators were either unbiased or closer to the experimental estimates than the cross section estimates.

<sup>21</sup> Restrictions include the need to obtain a visa (for any country but few exceptions like South American nations excluding Venezuela, one of the most important Colombian's destinies, and Korea), which requires in most cases travelling to Bogotá (the only city with consulates that issue visas), prolonged waiting times, and generally paying very high costs.

which there are different motivations to migrate, different horizons of migration, restrictions to migrate, etc. In other words, the evidence against using matching estimators with the Colombian data is not compelling.

#### *Determinants of migration experience and remittances*

The next step is to include in the propensity score estimation a set of variables which we can reasonably argue resemble the household's situation at the moment of migration (or close to). Since about 55 per cent of migrants left the country within the previous five years, we include variables we expect not to have changed in that period, like gender or education, and those we can estimate their level in the past, such as age. In the specific case of migrants we ask respondents some recall information on the status of the migrant right before leaving the household.

To define the control variables of the propensity score we use information of current household members, household migrants, and former household members not living in the household currently, to determine the situation of the household right before they became households with migration experience. For example, when defining the number of individual in the household five years ago, we count the number of people living in the household currently, the number of migrants of the household, and the number of those members formerly living in the household but not living there currently.

We include in the propensity score the number of households members between 0 and 5, 6 and 17, 18 and 29, 30 and 39, 40 and 49, 50 and 59 and 60 or more years of age (five years before the time of the survey). We also include variables that seek to quantify the human capital of the household: the lowest and highest number of years of education of members of the household 25 and more and their respective squared terms. We also include a dummy variable that indicates whether any of the current members of the household gave a different answer to the question "where did you live "five years ago?" to the rest of its members. We also use some key baseline conditions like a dummy variables that indicate whether the household had an account in a financial institution five years ago, whether it used an account to fund a business five years ago, and whether it owned the house where it lived, whether it had the possibility to exploit land for economic purposes, and whether it owned a business five years ago; the share of women 12 or more that participated in the labour market five years ago, the share of men 12 or more that participated in the labour market five years ago, the number of people with complete higher education or more, and interaction terms between having had an account five years ago and the highest and lowest number of years of education of all member of the household and their squared terms, and with the number of people with higher education or more in the household. The same interactions were calculated for the dummy variable that indicates whether the household had an account to fund a business five years ago, for the shares of women and men participating in the labour market, for the dummy variables that indicates whether the household owned a house five years ago, whether it had access to land for economic purposes, and whether it owned a business five years ago.

Table 18 shows the marginal effects based on our propensity score estimates. The table has four columns. The first three columns show the marginal effect of changing the control variables in one unit on the probability of having migration experience, first, regardless of whether the household has absent or returnee migrants, then for households that only have absent migrants, or both absents and returnees migrants, and the third column for households that only have returnees, or both returnees and absents migrants. That is, the set of households having both absents and returnees migrant are in columns two and three. The fourth to sixth columns show the marginal effects on the probability of receiving remittances. Here we consider two cases. In the first one, which we call *family*, we compare those households receiving

remittances from a former member with households without migration experience that do not receive remittances (results do not change much if we add to the comparison group households receiving remittances from other sources different to relatives). The second case, which we call *all*, compares households receiving remittances from any source with households without migration experience not receiving remittances.

The table only includes variables satisfying the balancing property, that is, those for which it was possible to find matches in the comparison group. The table shows that households with more members aged 0-5 in year t-5 are more likely to have migration experience (especially absent migrants), while those with more members in the age bracket 30-49 in year t-5 are less likely. In order to have an idea of the support on which our parameters are estimated we present in Figure 9 the distribution of the probabilities of being a household with migration experience or receiving remittances from family (results do not change when we consider remittances from any source)<sup>22</sup>. The continuous line shows the probability of households having migration experience (top left figure) or receiving remittances (other three figures), while the dashed line shows it for the comparison households, which have much smaller probabilities. The common support covers probabilities below 0.4.<sup>23</sup> By matching households with similar probabilities at the moment of getting the required counterfactual, the matching method corrects for these differences in the densities of the two populations.

The probability of having migration experience in general or absent migrants is also higher the higher is the schooling of the household member with more years of education, although this happens at a decreasing rate. For example, if that member has 16 years of schooling (higher education), the probability of that household having migration experience would be 24 percent higher relative to a household where that member has only 6 years of schooling (first year of secondary education). The probability of having migration experience is also higher when the household had an account in a financial institution in year t-5.

There are some interesting results when the schooling of the member of highest years of education is interacted with financial variables. A household is more likely to have returnees if in year t-5 it had an account in a financial institution and more schooling, but less likely when it had an account for a business and more schooling, as measured by the lowest number of years of education of its members 25 and older. Land ownership provides some additional insights. A household is more likely to have returnees when it had land in year t-5 and more schooling (measured by the education of the member with more years of schooling), while the opposite happens in the case of absentee migrants. That is, land possession would be a reason for the typical returnee to return, and the typical absentee to stay absent.<sup>24</sup>

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<sup>22</sup> By support we mean the values of the probability of having migration experience,  $P(D=1|X)$ , for which we can find both households actually with and without migration experience.

<sup>23</sup> Note that the standard Stata code uses as common support the range between the lowest and the highest estimated probabilities for the treatment group, that is, the estimated probabilities for households actually having migration experience or receiving remittances. In the case of the probability of having migration experience, the common support should include probabilities below 0.374, while the Stata code would include as well those households with migration experience which probabilities are between 0.374 and 0.543. According to the figure, this should not be a concern in our case since the mass of treated that goes beyond the highest probabilities among the comparison household is negligible (only 10 out of more than 500 observations).

<sup>24</sup> Interpreting these results requires some speculation but could suggest some form of attachment to the country when land is owned. For migrants that left in the late 1990s it can be related to low property values (due to recession and insecurity) at the moment of migrating, which prevented them for selling their property, and higher values later once the economy began to recover, around 2005. In the case of absentees the motivations can work just in the opposite direction. They might have been able to sell their property or are threatened to return. In any case, land possession seems to influence the decision to return or stay abroad.

**Table 18: Marginal effects on the probabilities of having migration experience and receiving remittances**

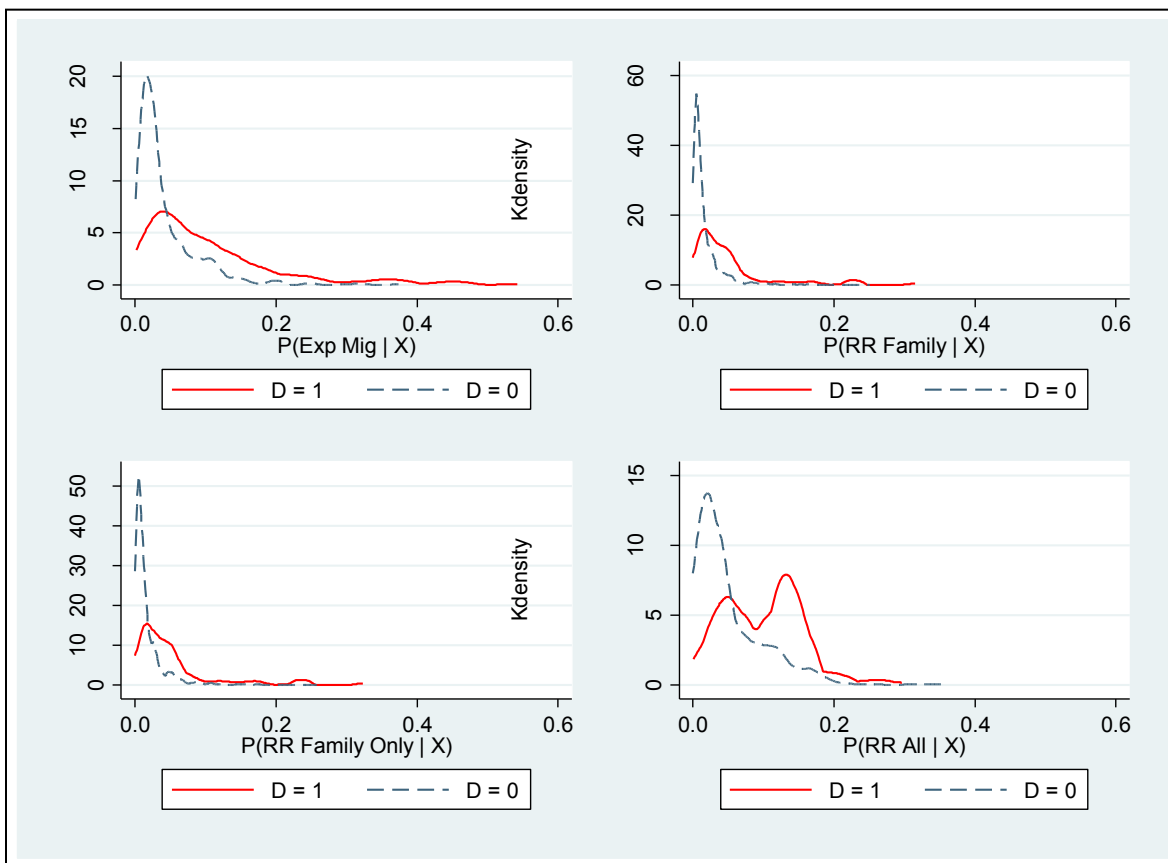
Variable	Migration Experience						Receiving Remittances			
	Absent or Returnee		Absents		Returnees		Family		All	
	dF/dx	z	dF/dx	z	dF/dx	z	dF/dx	z	dF/dx	z
0-5 (Number of people 5 years ago)	0.009	1.66*	0.009	2.82**	0.004	1.07	0.003	2.49**	0.013	2.41**
6-17 (Number of people 5 years ago)	-0.001	-0.42	0.000	-0.21	-0.001	-0.56	-0.001	-1.26	-0.002	-0.15
18-29 (Number of people 5 years ago)	-0.005	-1.12	-0.005	1.92*	0.000	0.01	-0.001	1.64*		
30-39 (Number of people 5 years ago)	-0.015	2.68**	-0.011	2.99**	0.000	0.15	-0.003	-2.58**	0.000	-0.08
40-49 (Number of people 5 years ago)	-0.019	-3.27**	-0.011	-3.47**			-0.002	-1.85*	-0.002	-0.33
50-59 (Number of people 5 years ago)	-0.008	-1.32			-0.001	-0.21	-0.003	-2.13**	-0.005	-0.86
60+ (Number of people 5 years ago)	-0.001	-0.17*	-0.001	-0.37			-0.001	-0.95	0.004	0.62
Highest years of Education of Members of household 5 years ago	0.024	2.39**	0.008	2.13**			0.001	-2.73**	0.033	2.29**
(Highest years of Education of Members of household 5 years ago) <sup>2</sup>	-0.001	-1.91*	0.000	-0.98			0.000	-2.4**	-0.001	-1.77*
Lowest years of Education of Members of household 5 years ago	-0.013	-1.43	-0.002	-0.5	-0.002	-0.39	-0.001	-2.89**	-0.030	-2.25**
(Lowest years of Education of Members of household 5 years ago) <sup>2</sup>	0.001	0.91	0.000	-0.37	0.000	0.33			0.001	1.73*
Number of people in household 5 years ago										
¿Did some current member of the household response different to the rest of members to the question "where did you live 5 years ago?"	-0.002	-0.17	-0.001	-0.10	-0.003	-0.39	0.001	0.39	-0.003	-0.19
¿Did the household have an account in a financial institution five years ago?	0.140	2.29**	0.008	0.26	0.033	1.12	0.011	0.98	-0.013	-0.26
¿Did the household used such account to fund business five years ago?	-0.005	-0.06	0.927	2.64**	-0.019	-0.51	0.235	1.35	-0.029	-0.9
Labor participation 5 years ago (Males)	-0.018	-0.48	-0.002	-0.36			-0.002	-0.87	0.054	1.17
Labor participation 5 years ago (Females)	0.016	0.59	0.007	0.27	-0.020	-0.9	0.014	1.46	0.070	1.79*
¿Did the household own the house the house where it lived 5 years ago?	0.018	0.5	0.001	0.08	-0.015	-0.77	-0.001	-0.13	0.053	1.16
¿Did the household have access to land	0.695	0.52	0.994	2.28**	-0.030	-1.58	0.999	1.84*	0.992	1.8*
¿Did the household own at least one business 5 years ago?	0.049	0.79	-0.004	-0.49	-0.006	0.29	0.022	0.75	-0.040	-1.86*
Number of people with complete tertiary education 5 years ago	-0.001	-0.03			-0.020	-1.11	0.006	0.95	0.003	0.05
Account_5*Highest years of education	-0.024	-2.87**	-0.006	-1.21	-0.003	-0.57	-0.002	-1.45	-0.006	-0.49
(Account_5*Highest years of education) <sup>2</sup>	0.001	2.89**	0.000	1.41	0.000	-0.04	0.000	1.45	-0.001	0.86
Account_5*Lowest years of education	0.007	0.96	0.005	1.02	0.003	0.64	0.001	0.98	0.012	1.32
(Account_5*Lowest years of education) <sup>2</sup>	-0.001	-1.32	0.000	-0.87	0.000	-1.2	0.000	-1.64*	-0.001	-1.88*
Account_5*Number of people with tertiary education or more					0.041	2.99**	0.003	0.72	-0.040	-1.03
Account to fund business*Highest years of education	-0.021	-0.91	-0.021	-1.84*	-0.001	-0.04	-0.005	-1.60	0.109	2.06**
(Account to fund business*Highest years of education) <sup>2</sup>	0.001	1.04	0.001	2.28**	0.000	0.37	0.000	2.53**	-0.004	-1.86*
Account to fund business*Lowest years of education	0.038	1.36	-0.016	-1.95*	0.021	1.17	-0.003	-0.79	-0.093	-2.22**
(Account to fund business*Lowest years of education) <sup>2</sup>	-0.002	-1.51	0.001	1.2	-0.002	1.65*	0.000	0.87	0.005	2.22**
Account to fund business*Number of people with tertiary education or more	-0.052	-1.3	-0.114	2.35**	-0.042	-1.21	-0.071	-3.52**	-0.023	-0.29
Labor participation (women)*Highest years of education	-0.003	-0.84	-0.007	-1.08	0.005	0.89	-0.005	-2.43**	-0.022	-1.98**
(Labor participation (women)*Highest years of education) <sup>2</sup>			0.000	1.12	0.000	-0.58	0.000	1.96**	0.001	1.19
Labor participation (women)*Lowest years of education	-0.005	-0.65	0.002	0.33	-0.006	-1.05	0.003	1.64*	0.018	1.67*
(Labor participation (women)*Lowest years of education) <sup>2</sup>	0.001	0.91	0.000	0.21	0.000	1.04	0.000	-0.98	-0.001	-1.44
Labor participation (women)*Number of people with tertiary education or more	0.012	0.49	-0.031	-2.51**	0.002	0.14	-0.002	-0.46	0.039	1.42
Labor participation (men)*Highest years of education	-0.006	-0.63							-0.033	-2**
(Labor participation (men)*Highest years of education) <sup>2</sup>	0.000	0.87							0.001	1.88*
Labor participation (men)*Lowest years of education	0.010	1.38							0.008	2.55**
(Labor participation (men)*Lowest years of education) <sup>2</sup>	-0.001	-1.48					0.000	-0.03		
Labor participation (men)*Number of people with tertiary education or more	-0.001	-0.33			0.014	1.28	0.002	0.46	-0.072	-1.85*
ownhouse_5*Highest years of education	-0.004	-0.49	0.001	0.54	0.001	0.14	0.000	-0.05	-0.007	-0.65
(ownhouse_5*Highest years of education) <sup>2</sup>	0.000	0.68			0.000	0.65	0.000	0.83	0.000	0.33
ownhouse_5*Lowest years of education	0.000	0.26	-0.001	-0.23	0.001	0.21			0.008	1.03
(ownhouse_5*Lowest years of education) <sup>2</sup>	0.000	0.04	0.000	0.29	0.000	0.04			-0.001	-1.32
ownhouse_5*Number of people with tertiary education or more					-0.009	-0.59	-0.009	-2.01**	0.039	1
land_5*Highest years of education	-0.043	-0.46	0.147	-1.96**	0.086	1.68*	-0.058	-1.72*	-0.185	-1.36
(land_5*Highest years of education) <sup>2</sup>	0.003	0.55	0.009	1.9*	-0.005	-1.66*	0.004	1.71*	0.011	1.26
land_5*Lowest years of education	-0.006	-0.22	0.036	1.18	0.003	0.25	0.029	1.47	0.066	0.89
(land_5*Lowest years of education) <sup>2</sup>	0.000	0.1	-0.003	-1.29	-0.001	-0.97	-0.002	-1.48	-0.005	-0.9
land_5*Number of people with tertiary education or more	-0.153	-0.81	-0.336	-1.58	0.102	1.08	-0.132	-1.62	-0.432	-1.13
business_5*Highest years of education	-0.022	-2.24**			-0.006	-0.98	-0.003	-1.2		
(business_5*Highest years of education) <sup>2</sup>	0.001	2.57**			0.000	1.10	0.000	0.91		
business_5*Lowest years of education	0.013	1.33			0.005	0.92	0.001	0.53	0.025	1.44
(business_5*Lowest years of education) <sup>2</sup>	-0.001	-1.03	0.000	-0.41	0.000	-0.33	0.000	-0.5	-0.002	-1.37
business_5*Number of people with tertiary education or more					0.018	0.85	0.012	1.62	0.077	3.48**
Number of observations	949		901		731		880		949	
Pseudo R <sup>2</sup>	0.131		0.1151		0.1131		0.2132		0.1935	

Source: DOTM Colombian Household Survey (authors' calculations)

Note: The numbers in the first two columns are the percentages aggregating by row.

The estimates also show that the probability of receiving remittances is higher for households with more members aged 0-5, and lower for those with more members ages 30-39 in year t-5. It is also higher the higher is the education of the most educated member of the household 25 or older, although its importance grows at a decreasing rate. Households with low schooling (of the member with lowest years of education aged 25 or more), have a lower probability to receive remittances, while those that owned land in t-5 are more likely to receive remittances.

**Figure 9: Distribution of the probabilities of having migration experience and receiving remittances for households**



Source: DOTM Colombian Household Survey (authors' calculations)