Chapter 15
Population Distribution and Internal Migration Issues in LAC

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15.1 Introduction

The evolution of the spatial distribution of the population of Latin America, in the last decades, is showing a heterogeneous path, while some countries have growing concentration around the main city or cities; others display an inverse pattern. Several factors are described in the first part of this chapter, affecting people and labor mobility across the territory.

There is not only one clear pattern of mobility in Latin America, but also a high heterogeneity of processes due to different policies, endowments, background, among others.

While three or four decades ago the main concern about moving across the territory was the migration from rural to urban areas, in the last decades Latin America has reach an urbanization rate comparable to developed countries, so the interested has moved to internal migration among the cities or regions within the country.

Internal migration has being one of the traditional concentration movements to the big cities. In this context, one of the aims of this chapter is to assess the impact of internal migration on population concentration around main cities for Argentina, Bolivia, Brazil, Chile, Costa Rica, Guatemala and Mexico.

In the period of analysis, most of the countries have implemented market policies in order to promote growth. In a competitive theoretical economy, the market arbitrages the wage and unemployment differential by moving people

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across the territory. Other of the questions addressed in this chapter is whether migrants follow the market signal or there are others forces moving people around the country.

After a long descriptive analysis about population distribution and migration in several countries of Latin America, a model to explain migration for Argentina, Bolivia, Brazil, Chile and Mexico is estimated and the results reported showing how different are the process but the concentration still is a strong force attracting people to the main cities.

15.2 The Evolution of Population Distribution in Latin America

While the pattern of distribution of a territory's population depends on a complex range of economic, social, political, cultural, and environmental factors, from the demographic point of view, the spatial distribution of the population is mainly determined by three elements. The first is internal and international migration. Each time there are migratory displacements that generate migratory balances other than zero, there is a redistribution of the population. Said redistribution implies, *ceteris paribus*, an increase in the demographic weight of areas with net immigration and a reduction of the weight of areas with net emigration. The second is the natural growth differential which, *ceteris paribus*, elevates the representation of areas with above average growth and reduces that of areas with lower than average growth. Finally, there are processes of annexation, reclassification, redefinition and modification of borders that, without the two prior forces operating, modify the relative demographic weight of the various territories within a country.

The magnitude of the redistributive effect in the territory does not depend on migratory intensity (the likelihood of migrating) but on the size of the migratory balances. All in all, the intensity of internal migration is not irrelevant for the redistributive effect of the migration. A low intensity keeps the redistributive effect at low levels; even in a more redistributive theoretical scenario, which is one in which there are no countercurrents, if the population that migrates is limited, it is impossible for it to produce a massive redistributive effect. For its part, high intensity offers space for massive redistribution, though it is worth reiterating that its final effect would depend on the size of the balance and not the number of people who migrate.

In Latin America, internal migration has tended to come about in response to regional differentials in economic and social areas. Given that these inequalities are marked, the flows have been sizeable and have had significant redistributive effects because they have taken place between migrant-sending areas – typically those with lower relative development – and attractive areas, which tend to be those with greater relative development. By virtue of this relationship, migration has been many things. First, it has been the motor of urbanization – the gap that exists

between country and city in the region is old, deep and systematically unfavorable for rural areas-, which supposes a massive and substantive redistribution of the population in demographic, economic, sociocultural, political and environmental terms. It also is the factor that explains the increase, which was sustained over the past 60 years in various countries of the region, in demographic concentration (and other types as well) in the main city and in the major administrative division in which it is located given that the city tends to provide better standards of living and greater labor and educational opportunities. Third, it is the mechanism that explains the rapid growth of the populations of certain subnational spaces that present accelerated economic dynamism in view of specific territorial development policies, market forces or the combination of the two. In some countries in the region such as Mexico with its northern border and the state of Quintana Roo, where Cancun is located, the emergence of these dynamic subnational spaces led to the consolidation of alternatives to the historic space of concentration (the metropolitan region). This in turn led to processes of demographic de-concentration. Fourth, migration is the force that has eroded demographic growth – leading to other demographic changes, such as premature aging- of regions that present chronic poverty, some of which are well-known. These include northeastern Brazil, the Peruvian *sierra*, the Bolivian *altiplano*, northwestern Argentina and Chile's Araucanía region, which systematically lose portions of their population due to migration.

However, internal migration in Latin American countries also has been influenced by other factors. These include development strategies and territorial public policies, several of them directly migratory, particularly in the past. In some cases, these factors have increased the effect of territorial inequalities on the size and direction of the flows, as occurred with the internally focused development strategy and country-to-city migration. But in others, they have had an effect that is different from the one that is derived from regional inequalities. This is the case of migration towards demographic border areas which in Latin America and particularly in South America tend to be large, sparsely populated areas that are rich in natural resources. Though these areas are not known for having greater income levels or better living conditions, they still receive large numbers of immigrants as a result of a combination of policy actions – including colonization, increased connectivity, productive, social and territorial investment and strengthening of the government and its agencies – and the arrival of private capital (which is frequently attracted by government incentives).

Finally, in a vein that diverges from the focus of this document but that should at least be mentioned, internal migration, including intra-metropolitan migration, is the variable that defines the redistribution of the population in the region's large cities. Until recently, this redistribution was marked by the massive exodus from central areas and the arrival of sizeable flows to the peripheries, which come from other parts of the country and within the same cities (precisely the flows that have come out of central and pericentral areas).

In addition to this very short and general description of the spatial redistribution patterns of the regional population and the role of migration in them, this study

presents four empirical sections based on the latest available census information on the location of the population and migration. One of them offers specific calculations of internal migration intensity trends (considering migration among Major Administrative Divisions, which are called DAMs in Spanish, and Minor Administrative Divisions, which are called DAMEs in Spanish) and their redistributive effect on the population (in this case only among DAMs). The second addresses the process of urbanization and specifically the role played by rural–urban migration in it. The third, which is based on national cases, examines population concentration in the metropolitan DAM (which houses the main city) and a trend in which migration redistributes the population to alternative DAMs with the subsequent demographic de-concentration. The fourth section presents an overview of migration in regions that present chronic poverty. These analyses are based on recent publications by ECLAC (2012), Cunha and Rodríguez (2009), Rodríguez and Busso (2009) and Rodríguez (2011).

15.2.1 On Migratory Intensity and the Redistributive Impact of Internal Migration

Table 15.1 presents a generalized reduction of migratory intensity in the region. It is important to note that the data from the censuses of the decade of 2010 support this trend (Table 15.1), though they also show that there are exceptions. For example, Panama registered a higher Crude Migration Intensity in 2010 than it did in 1990 (though it was lower than that of 2000). Using micro data from three censuses from the decade of 2010 (Ecuador, Mexico and Panama), we present the results of a typification exercise using age for this rate in Table 15.2 in order to evaluate how much of this downward trend could be attributed to a change in the age group structure (Rodríguez and Busso 2009). The results are eloquent, as the typified rates maintain the trend of the observed rates.

There are several potential causes of this decrease, including the gradual reduction of the relative importance of rural–urban migration (a matter that will be examined in section C), the replacement of migration with commuting, and new forms of virtual interaction (Aroca and Atienza 2011). All in all, this trend and its determinants are the object of debate among the various theoretical frameworks that exist for understanding internal migration (Rodríguez 2011). Interestingly, a recent global study (Bell and Muhidin 2009) not only corroborates this trend in the case of Latin America but also verifies that it exists in other regions of the world as well. As a result, they configure a finding of global reach whose causes are probably also global in reach, which is effectively applied to the three determinants mentioned above.

In Latin America, there are two additional determinants that must be underscored. One of them is the sustained increase in international emigration, which can act as a substitute for internal migration in some countries or specific

Table 15.1 Latin America and the Caribbean: internal mobility rate, 1990 and 2000

	Absolute or life time migration		Recent migration (within last 5 years)	
Census round	Major administrative division (%)	Minor administrative division (%)	Major administrative division (%)	Minor administrative division (%)
1990	17.5	34.2	5.1	12.6
2000	17.7	35.2	4	8.7

Source: Rodríguez 2008, p. 139

Table 15.2 Evolution of the gross rate of observed mobility typified by age (per 1,000), three countries with censuses in the decade of 2010

Year	Country	Ecuador	Panama	Mexico
1980	Population	6,710,228		
	DAM migrants	568,556		
	Observed rate	**84.7**		
	Typical rate	**84.7**		
1990	Population	8,312,119	2,021,564	66,501,519
	DAM migrants	482,335	88,529	3,468,508
	Observed rate	**58.0**	**43.8**	**49.6**
	Typical rate	**57.7**	**43.8**	**49.6**
2000	Population	10,743,574	2,421,143	85,275,006
	DAM migrants	562,717	153,658	3,784,323
	Observed rate	**52.4**	**63.5**	**44.4**
	Typical rate	**53.1**	**64.1**	**44.8**
2010	Population	12,853,717	2,937,455	99,794,866
	DAM migrants	608,582	1,65,047	3,502,007
	Observed rate	**47.3**	**56.2**	**35.1**
	Typical rate	**48.9**	**55.1**	**36.3**

Calculations made by the authors based on MIALC and special processes from the 2010 censuses

areas within them. The second speaks to the end or interruption of major public programs for spatial redistribution of the population that was very important in the region between the 1950s and 1980s. In several countries in the region, these programs encouraged – sometimes in an imposing and/or not very transparent manner – the massive displacement of the population towards sparsely populated areas. The disappearance of these programs during the 1990s brought about the extinction of one of the motors of internal migration in the region (Rodríguez and Busso 2009).

This reduction of the intensity of internal migration can lead to a certain devaluation of the same by governments, researchers and public opinion. However, in this section, we will note that the size of internal migration is still very significant, that its profile is changing, presenting new challenges, and that its qualitative effects, which will be measured using innovative procedures, are relevant for places of origin and destination.

Linked to the above, the results show the attenuation of the redistributive effect of internal migration in a territory. This effect, on an aggregate scale (that is,

Table 15.3 Latin America: evolution of the global migratory effectiveness index and aggregate net migration rate between DAMs by country

	Migration effectiveness index, among DAMs				Aggregate net migration rate, among DAMs			
Country	1980	1990	2000	2010	1980	1990	2000	2010
Argentina			11.0				0.7	
Bolivia		23.8	28.8			2.7	3.4	
Brazil		25.4	17.6			2.0	1.2	
Chile	27.0	10.5	5.8		3.2	1.3	0.7	
Colombia		19.5	17.1			3.1	1.5	
Costa Rica	15.0		13.2		2.0		1.5	
Cuba			39.3				1.7	
Ecuador	51.6	28.1	30.9	14.2	8.7	3.3	3.2	1.41
El Salvador		48.1	15.7			4.6	1.0	
Guatemala		35.3	27.9			1.8	1.6	
Honduras	34.6		31.9		3.4		2.7	
Mexico		33.5	27.5	19.2		3.3	2.4	1.3
Nicaragua		33.6	21.1			2.4	1.0	
Panama		20.2	51.3	46.0		1.8	6.5	4.9
Paraguay	33.4	36.5	25.0		7.2	6.7	3.8	
Peru		28.7	29.7			4.9	3.2	
Dominican Republic			25.2				2.1	
Uruguay	21.2	22.9			3.2	3.0		
Venezuela			25.9				2.6	

Source: Calculated by the authors based on the MIALC and in special processing of databases of the 2010 censuses of Ecuador, Mexico and Panama

national) can be measured using two indices. One is the global migration effectiveness index, which relates the sum of the migratory balances of all entities (in absolute values so that they do not cancel each other out) to the sum of the gross migration of each entity. This ratio provides an estimate of the efficiency of the migration as a force that redistributes the population in the territory which is maximized when there are only currents and no countercurrents, that is, some entities only receive immigrants and others only report emigrants.

But this efficiency is measured in terms of migration undertaken and thus does not consider the size of the migration, which is key for its redistributive effect. In other words, there could be a country in which migration is very efficient as a mechanism for redistributing the population, but its final redistributive effect may be very low because the fraction of the total population that migrants represent is very small. In order to capture this total redistributive effect, one uses the second index, which is called the aggregate net migration rate. Here, the sum of gross migrations of each entity (DAM or DAME) is divided by the total population that is exposed to the risk of migrating (Bell and Muhidin 2009).

The calculation of the two indexes (Table 15.3) reveals the absence of a clear pattern in the case of migratory efficiency but suggests a clear reduction of the redistributive effect of the migration of the population among DAMs. This is linked

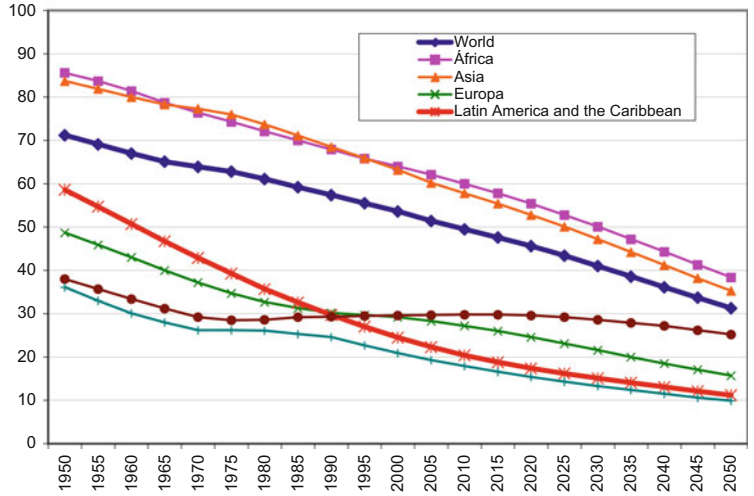

Fig. 15.1 World and regions: percentage of the population in RURAL areas, 1950–2050 (Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2010 Revision, http://esa.un.org/unpd/wpp/index.htm. Note: The term Latin America and the Caribbean refers to the 42 countries and territories identified by LACDC as comprising the region. The term Latin America refers to the 20 countries identified by LACDC as making up the sub-region (17 on the mainland and three Caribbean island territories: Cuba, Dominican Republic and Haiti). For further information, Guzmán et al. (2006))

to the decrease in migratory intensity. In fact, the results of the three countries with census micro data from the decade of 2010 suggest a continuation of this trend towards the decrease of the redistributive effect of migration.

This reduction in size notwithstanding, internal migration still involves large contingents of the population, has powerful implications for regional development, impacts regional balances in the area of employment and has a variety of qualitative impacts that we have only recently been able to estimate with relative precision (ECLAC 2012; Rodríguez and Busso 2009).

15.2.2 Urbanization and Rural to Urban Migration

Latin America and the Caribbean is the world's most urbanized developing region. Currently, only 20 % of the region's population is rural, as can be seen in Fig. 15.1. Only Northern America (USA and Canada) has a lower percentage. UN official population projections forecast a continuous decreasing of this percentage, reaching around 10 % in 2050 (Fig. 15.1).

This very rapid urbanization has been caused by an impressive rural exodus since 1930s, which had a peak between 1940 and 1980. In fact, 1950s levels of

Table 15.4 Latin America: net rural–urban migration and percentage of urban growth due to net rural–urban migration, by sex 1980–2010

	Net rural–urban migration rate (by thousand)					
	1980–1990		1990–2000		2000–2010	
Countries	Male	Female	Male	Female	Male	Female
Argentina	5.1	5.3	3.0	2.9		
Bolivia	21.2	23.9	8.0	8.4		
Brazil	10.6	11.4	7.6	8.6		
Chile	1.5	1.7	3.5	3.2		
Colombia	7.3	8.5	7.6	6.8		
Costa Rica	15.5	15.8	18.9	18.5		
Cuba	13.2	13.6	4.9	5.2		
Ecuador	15.1	16.0	10.5	10.2	5.3	5.4
El Salvador	15.4	15.1	16.6	16.5		
Guatemala	10.6	11.9	25.8	26.3		
Haití	29.0	12.1	32.6	12.8		
Honduras	17.5	20.7	14.2	15.6		
México	8.6	8.4	7.0	7.1	3.1	5.1
Nicaragua	8.4	9.5	4.7	6.2		
Panamá	10.5	11.6	16.7	15.9	6.4	6.8
Paraguay	18.6	21.0	13.0	14.4		
Perú	8.1	9.0	7.1	7.7		
Rep. Dominicana	6.9	6.7	13.1	13.7		
Uruguay	3.7	3.2	1.2	1.5		
Venezuela	5.4	6.3	4.9	4.9		

Source: ECLAC, 2012, Population, Territory and Sustainable Development, Santiago, Chile, ECLAC, LC/L.3474(CEP.2/3)

urbanization in Latin America and the Caribbean were lower than those registered in developed regions (North America, Europe and Oceania). In less than 40 years, the region reached urban levels of Europe and Oceania, thanks to rural exodus which generated an explosive urban growth. Subsequently, in the past 20 years, urban growth slowed down due to demographic transition and the reduction of emigration from de countryside. Nevertheless, rural exodus has continued, and so has urbanization. In fact, results from indirect techniques[1] applied to most recent censuses data show that rural to urban net migration rates are still positive indicating a persistent net out-migration from rural areas (Table 15.4).

The urbanization process in Latin America between 1950 and 1980 was driven by an industrialization strategy promoted by the governments from most LA countries. This strategy was named "internal development" or "import substitution", although most recently a newer – in our opinion a more acute term has been developed "State led industrialization" (Ocampo 2006). This strategy promoted

[1] Census Survival Ratio (CSR) method, http://www.un.org/esa/population/techcoop/IntMig/manual6/chapter2.pdf.

urban activities (industry and services) and favored "modernization" of countryside economy. Both changes involved a dynamic economic growth in cities and the creation of a large workforce surplus in rural areas of countries. During 1980s, most of the governments change this strategy by another called "neoliberal", based on free market, private sector and open economy. In spite of its anti-metropolitan or even anti-urban bias – due to the fact that commodities are the lion's share of Latin American exportations and the locus of commodity production are rural areas. However, urbanization process and rural exodus continued almost unaffected; the main reason was the persistent social gap between rural and urban areas. Nowadays the region has many development strategies (from socialist to neoliberal approaches), but any of them has closed this gap, and this is the explanation for the continuous urbanization and "rural exodus".

Latin American urbanization process has different characteristics from those achieved in the current developed countries, in which urbanization, industrialization and economic development were concomitant and synergistic. Although, industrialization has contributed to Latin America's modernization and has facilitated social achievements that positioned the region in compliance with most of the MDG's requirements, its progress was detached, at least partially, from an economic, social and institutional progress such as the one experimented by the current developed countries. On the other hand, this minor development involved a cumulative deficit in infrastructure, resources and regulations. This cumulative deficit is the main reason why Latin American cities' are marked by poverty, precariousness, informality and crime.

Expressions such as over-urbanization and hyper-urbanization have been used to describe the region's high levels of urbanization without accompanying the level of economic and social development typical of industrialized countries (Rodriguez and Martine 2008). Although it cannot be questioned that the region is quite below the developed regions in terms of per capita income, productivity and poverty, the over-urbanization hypothesis can lead to an erroneously negative evaluation of the Latin American urbanization. In fact, Latin America follows the classical pattern of positive association between urbanization and development because, in average, the higher urbanization the higher level of human development at country level (Fig. 15.2).

15.3 Concentration of and Migration to Metropolitan Regions

The urbanization process in Latin America has been historically linked to the concentration of the population in the major administrative division (MAD) containing the main city, usually the capital, of the country. In countries like Argentina, Chile, Panama and Uruguay, over 40 % of the population live in metropolitan MADs, (where the main city and/or capital is located). However, in

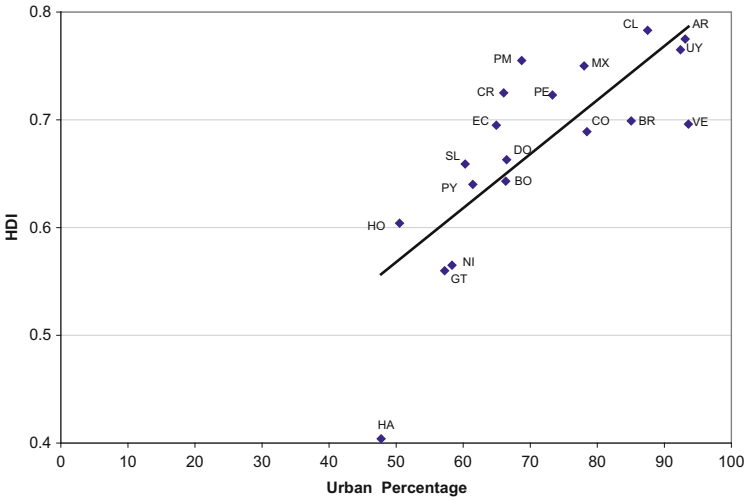

Fig. 15.2 Latin America, 2010: percentage of urban population and human development index by countries (Source: Based on Human Development Report 2010 and data base DEPUALC, 2009, CELADE, UN.)

other countries of the region (like Brazil, Colombia, Ecuador, Mexico and Venezuela (Bol. Rep.)) this highly concentrated pattern does not exist.

Since 1980 some signs of de-concentration became apparent. However, according to the systematized information taken from DEPUALC database (Spatial Distribution of Population and Urbanization in Latin America and the Caribbean) created and maintained by CELADE (www.cepal.org/celade/depualc/) there is no clear evidence of a sustained process of demographic de-concentration in Latin American countries, except for a few. Between 1980 and 2000, in Chile, Costa Rica, Ecuador, Panama, Paraguay and the Dominican Republic an increase of the relative participation of corresponding MAD in national population was registered. In the rest of countries included on Table 15.1, there is stability in the concentration process or a slight reduction of metropolitan concentration.

As Cunha (2002) stated, it is in fact "premature to claim that the demographic concentration that has taken place in the region, in the past 40 years is suffering a conclusive reversion of significant proportions". This same research underlined that "in the majority of Latin American countries, the metropolitan region (or the region's capital when MADs were not constituted yet) still presented an equal or even larger increase than the country's, at least up to the 80s". Indeed, this trend can be observed in Cunha and Rodriguez (2009).

It is also important to consider that even in countries where the main metropolitan region has grown slower than the national population, which is the case of Argentina, Bolivia, Brazil, Mexico, Nicaragua and Venezuela (Bol. Rep.), it does not mean that the metropolitan agglomeration phenomenon has stopped or simply disappeared. Data from DEPUALC reveals that in many countries in spite of the

Table 15.5 Latin America (three selected countries): metropolitan cities by total net migration, proximity and distance, absolute balances, census from the decade of 2010

	Net migration		
	Total	Closer	Farther
Panama City	70,789	2,553	68,236
Mexico City	−200201	−24386	−175815
Quito	23,284	−6992	30,276
Guayaquil	−7487	−11388	3,901

Source: Developed by the authors using processing of census microdata from Ecuador, Mexico and Panama 2010 with REDATAM

Note: Total migration: exchange of population between the city and the rest of the lesser administrative divisions of the country; Close migration: exchange of population between the city and lesser administrative divisions that form part of the DAM in which the city is located; Distant migration: exchange of population between the city and lesser administrative divisions outside of the metropolitan DAM

reduction of total increase, there are large agglomerations expanding faster than national average. Consequently, empirical evidence suggests that the decreasing importance of main cities or metropolitan regions of countries cannot only be substantiated on de-metropolitanization, demographic de-concentration; or the so called counter-urbanization as defined by developed countries. Gradual loss of importance of the greatest metropolises within the national population is not such a relevant phenomenon; however, the most interesting fact has happened in other agglomerations of smaller size, which have undergone a considerable population increase.

Leaving aside administrative regions to directly examine the metropolises, the data available from the 2010 censuses show a mixed situation in the area of migration from large cities, which may not be representative due to the exiguous number of countries available. Table 15.5 shows that Panama City is attractive to those living in its surrounding regions and those elsewhere in the country, while Mexico City presents a loss of population in the exchange with the rest of the country, a situation that has been present since 1990. Quito presents negative net migration with its surrounding areas (likely due to suburbanization), but a positive and larger net migration with the rest of the country that yields a positive balance. Guayaquil presents negative net migration in the exchange of population with its surrounding areas, and positive net migration with the rest of the country that is smaller in size and thus yields negative total net migration.

15.3.1 Interregional Migration, Development and Emigration from Areas Presenting Chronic Poverty

A stylized characteristic of internal migratory flows – adjusted, of course, to theoretical predictions – has been their direction from less developed regions to more developed ones. This is verified in a very elemental way through the

Table 15.6 Latin America and the Caribbean (select countries): simple linear correlation between the human development index and the net internal migration rate at the level of larger administrative divisions censuses from the decade of 2000

Country and year, indicator and reference year, number of large administrative divisions (DAM) with data			Index of simple correlation between the indicator and net migration rate (value p in parenthesis)	
Argentina, 2001	IDH 1996	24 DAM	0.407	(0.0242)
Bolivia, 2002	IDH 1994	9 DAM	0.619	(0.0378)
Brazil, 2000	IDH 1996	27 DAM	0.451	(0.0091)
Chile, 2002	IDH 1998	13 DAM	−0.01136	(0.5147)
Colombia, 2005	IDH 2000	24 DAM	0.414	(0.0222)
Cuba, 2002	IDH 1996	14 DAM	0.77	(0.0006)
Ecuador, 2001	IDH 1999	15 DAM	0.65	(0.0044)
Guatemala, 2002	IDH 1995–1996	22 DAM	0.442	(0.01972)
Honduras, 2001	IDH 1996	18 DAM	0.697	(0.0006)
Mexico, 2000	IDH 1995	32 DAM	0.408	(0.0102)
Nicaragua, 2005	IDH 2000	17 DAM	0.055	(0.4170)
Panama	IDH 2000	12 DAM	0.484	(0.0554)
Paraguay, 2002	IDH 2000	18 DAM	0.133	(0.29936)
Uruguay, 1996	IDH 1991	19 DAM	0.063	(0.60097)
Venezuela, 2001	IDH 1996	23 DAM	0.0686	(0.3780)

Source: Rodríguez 2008, p. 140, IDH stand by Human Development Index

correlation between the net migration rate presents, which reveals the attractive or emigrant-sending condition of a given DAM, and the human development index. It was determined that, almost without exception, higher human development levels are concomitant with higher average net migration rates, that is, with greater attraction or less sending (Table 15.6).

As we noted previously, the most important regularity is that between emigrant-sending areas, there are DAMs that present the areas of greatest relative poverty, those that are most affected by marginalization and those in which indigenous communities are found. These include nearly all of northwestern Argentina (with the exception of Catamarca), the four *altiplano* provinces of Bolivia (Chuquisaca, La Paz, Oruro and Potosí), seven of the nine states in northeastern Brazil, central-southern Chile (particularly Region IX, Araucanía), practically all of Guatemala and southern Mexico, the Peruvian sierra, a good part of Ecuador's Andean provinces (with the exception of Pichincha, which is a metropolitan DAM), and the indigenous areas of Panama. Examples that correspond to historically delayed areas of Chile in economic and social terms (Regions VII, VIII and IX, the central-southern part of the country where the Mapuche population is located), Bolivia (the *altiplano*, where there is a high concentration of Quechua and Aymara people), and Brazil (the northeastern region). These three areas are noteworthy because they generate emigration. The data from the 2010 censuses show continuity in this trend in Panama's Kuna Yala province, which presents a net emigration rate of around 4 % per year. In Bolivar and Carchi, two poor provinces in the Ecuadorean sierra,

one finds the greatest amount of emigration. Mexico's states of Chiapas, Guerrero and Oaxaca (the three poorest in the nation located in the southern region of the country) maintain net emigration. The erosion of the base of qualified human resources that this tenacious emigration implies for regions presenting chronic poverty is as important as or perhaps more important than the above, though its analysis goes beyond the reach of this text (ECLAC 2012; Rodríguez and Busso 2009).

15.3.2 A Model for Migrants

The model to be developed should possess the capability to evaluate the effect of different variables on the workers' migration decisions. In a free market, it is usually proposed that prices are the main sources of information upon which decisions are made. Thus, labor, under a free market, should focus mainly on salaries in each of the regions in the process of making the migration decision.

In addition, there will be other variables that affect migration and these are well documented in the literature. For example, attention is often directed to the role of amenities, development of the regions, the age of the migrant and his/her family status and so forth.

In order to set the model, we follow Kanaroglou and Ferguson (1996, p. 272), who stated that "because choice models are firmly rooted in behavioral theory, aggregation must result in models consistent with theory", and Borjas (2001), who used a similar model to study the worker's internal migration decision in USA.

This model is drawing on classical consumer theory. It is assumed that a worker's migration decision can be represented by the following index function determined by the utility maximization problem over possible locations $j \in \{1, 2 \ldots n\}$, (Aroca and Maloney 2005).

Therefore, $I^* = V_j - V_i - C$, where I^* is the index, V the indirect utility function in the context of random utility theory and C is the migration cost. In addition, V is a linear function of location characteristics X, such that $V_j = X_j \beta + \varepsilon_j$. Thus, if region j is preferred to the residential region i, the worker will move to region j if $I^* > 0$. Extending for the whole population, we might state the probability of migration as:

$$P(I^* > 0) = P\left(V_j - V_i - C > 0\right) = P\left(\varepsilon_i - \varepsilon_j \leq X_j\beta - X_i\beta - C\right)$$

Following Gourieroux (2000), for aggregate data we will estimate:

$$F^{-1}[p(I^* > 0)] = X_j\beta - X_i\beta - C$$

Where the probability function F is determined by the structure of the errors. Therefore, the estimation of this model will be done by a weight least square, given that $F^{-1}[.]$ will be heteroskedastic.

15.3.3 The Results

In order to estimate the model, data for Argentina, Bolivia, Brazil, Chile and Mexico was collected. The dependent variable is the rate of migration from region *i* to region *j*. This was calculated as the ratio between the number of people that have move from region *i* to region *j* over the number of people living at region *i* at the initial period.

Explanatory variables were included in the model to capture three different dimensions:

1. Public good availability and agglomeration benefits for people,
2. Market signals to reallocate labor force,
3. Level of regional development and
4. Moving costs.

The population size at the origin and destination region were included in the model to capture the pull effect associated to the public good and agglomeration benefits that people might get from larger populated regions, or the push effect or lack of attractiveness of regions with small size of population. Therefore, we expect that people tend to move to those regions with larger population size, leaving those regions less populated, promoting a population concentration process.

In order to capture the market signal, we include the wages paid at the regions. The literature has reported that in developing countries the wages or income at the origin region can have to effect, when it is increasing some people might deter movement to other region because local conditions have improve relatively to other regions. However, other people that had decided migration but could not afford the moving cost, after the increasing in income they can pay the moving cost and migrate to other region. In Aroca and Maloney (2005) is used the origin income or wage as a level variable to capture the later effect (Ln w_i), and they use the relative income or wage between the regions to capture the former effect (w_j/w_i), we follow them.

In addition, the GDP per capita at the origin and destination region was introduced to capture the level of development of each region (yppp) as well as an Human Development Index (idh), expecting that people tend to move to those more developed areas. Finally, logarithm of the distance (ldist) was introduce to capture moving or migration costs, which are higher the farter is the destination region from the origin one.

The results are showed in Table 15.7 for the five countries under study: Argentina, Bolivia, Brazil, Chile and Mexico.

15.3.4 Moving Costs

The variable logarithm of distance is introduced in the model for capturing the moving cost. The coefficients estimated for the five countries have the expected

Table 15.7 Probit estimation for dependent variable: (Migrant from *i* to *j*/population in *i*)

	(1)	(2)	(3)	(4)	(5)
	Argentina	Bolivia	Brazil	Chile	Mexico
Population_i	0.012**	−0.112	−0.007***	−0.057***	−0.013**
	(0.005)	(0.071)	(0.003)	(0.020)	(0.006)
Population_j	0.069***	0.215***	0.019***	0.161***	0.055***
	(0.005)	(0.049)	(0.003)	(0.017)	(0.004)
Ln w_i	−0.078	0.625*	0.242***	0.394	0.126
	(0.108)	(0.362)	(0.080)	(0.246)	(0.155)
W_j/w_i	0.063*	0.346**	−0.016	−0.304**	−0.290***
	(0.035)	(0.170)	(0.054)	(0.119)	(0.087)
yppp20	0.036***	0.084	−0.005	−0.002	-0.015**
	(0.005)	(0.059)	(0.011)	(0.009)	(0.008)
yppp2D	0.014***	−0.132***	0.004	0.014*	0.029***
	(0.004)	(0.047)	(0.009)	(0.007)	(0.006)
Idh0	−5.877***	1.220	−0.051	−0.568	1.342
	(2.257)	(0.860)	(0.313)	(0.885)	(0.970)
idist	−0.432***	−0.517***	−0.384***	−0.124***	−0.306***
	(0.050)	(0.075)	(0.032)	(0.038)	(0.025)
Constantt	7.029***	−1.891	0.070	−4.166**	−1.287
	(1.383)	(2.851)	(0.702)	(1.739)	(1.213)
N	552	72	702	156	987
R^2	0.847	0.741	D.621	0.824	0.754

Standard errors in parenthesis
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

sign and all of the very significant, indicating that people tend to move closer to their origin region. The impact of the moving cost on the migration decision is larger for Bolivia and smaller for Chile, while the other countries are in the average of those two. This is showing that moving costs is less important in the decision for Chilean than for Bolivian workers.

15.3.4.1 Public Good Availability and Agglomeration Benefits

The size of the population in the spatial unit, like region, state or province, at destination and origin is used to proxy the public good availability and agglomeration economies for the people. In this context, the larger the population it is supposed the more the availability of public good that makes a region more attractive.

The results show very consistent results, in the five countries, for the variable population size at the destination region. The estimates coefficients are strong significant, positive and systematically larger than the estimates for the population size at the origin region, which has the expected sign and are significant for Brazil, Chile and Mexico. However, it is not significant for Bolivia and for Argentina has a positive size. This result might be explained because people is migrating more from

more populated region to Buenos Aires that dominated the whole migration process.

This result is an indication that the countries have a strong inertial force to keep concentrating around the main city or cities, because they attract more people than the ones migrating to less populated areas, as is reported in Atienza and Aroca (2013) in this volume.

15.3.4.2 Market Signals to Reallocate Labor Force

Logarithm of the wage at the origin region and relative wage between the destination and origin region were the two variables used to evaluate migration as the market mechanism to reallocate people across the territory.

The results in Table 15.7 show different patterns. For Chile and Mexico there is a negative relation between relative wage and migration, which is contrary to what we expected. For these two countries there is an explanation that might be plausible. These two countries, especially Chile, have an important production of raw materials that are exported. That production is done in the periphery regions, so a significant number of people do not go to live there, but work there through a long distance commuting scheme. People are leaving those regions even though there are an increasing number of workers commuting to those areas. This fact might be behind what it is captured by these coefficients for Chile and Mexico, given that those areas show high wages however they are not attracting people to live there.

For Argentina, Bolivia and Brazil, the significant coefficients have the expected sign, however there are some differences. For Argentina only the relative wage are significant, which means that there is not income effect at origin region promoting migration, while in Brazil is the other way around, the only significant effect is the log of wage at origin region, which means that for those low income Brazilian states, the increase in income promotes significantly migration to other states. In the Bolivian case, both effects are strong and higher than any of the other four countries.

15.3.4.3 Level of Regional Development

In addition to public good availability, market signal we include some variables that intent to capture the effect of regional development on migration, under the assumption that more developed areas attract people, while less developed ones push people to other regions.

The results in Table 15.7 show that Brazilian migration is not motivated by regional development, while it is for Chile and Mexico; people tend to move to those more developed areas.

Argentina is the most interesting result in this dimension, because it shows a negative effect associated to the Human Development Index (idhO) at origin region. A similar process was reported by Molho (1995) for some Britain remote

areas. He called this "cumulative inertia" and described as a process where fewer out-migration opportunities jointly with a low development generate longer residence durations which become self-perpetuating, this results is complementary with the positive sign in the size of the population of the origin region. It means, people from less developed and populated areas are not the ones that are migrating, and it is reinforced with the positive sign associated to the gross domestic product per capita at the origin region.

15.4 Conclusions

Migration in Latin America is not a homogeneous process across the countries analyzed in this chapter. In the last decades, we find for some countries, people following the market signals, while in others movement of people across regions is dominated for some inertia that is there for other factors, like culture, institutions, and sociological characteristics.

In addition, it seems that there is not policy to promote movement of the people to those areas where they might have a better quality of life. In general, countries shows a reduction of the migration, so it is likely to find strong persistence in those processes that it is supposed are affected migration in the equilibrium direction.

According to the results of the estimated model, the most robust result is associated to the size of population at the destination region. It is an indication that people is moving to larger city than where they were living. This result explains in part, what other chapters in this volume have reported, which is a large concentration around the largest city of the country.

It also allows concluding that the migration as a market mechanism to reduce spatial inequality in the territory, like unemployment or wage differentials, is not working properly, so again, regional policy is required to promote a more balanced development in the countries territories.

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