

The Effects of Intra-metropolitan Migration on the Socioeconomic Composition of Medium-sized Cities in Latin American Countries

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The accelerated process of urbanization that characterized the countries of Latin America (LA) at least until the end of the 1970s had, as some of its main results, mega-cities with high inequality by income, households in dwellings in poor condition and unequal access to public goods and services. However, in recent decades, a series of changes have occurred that caused disruptions in these trends. One of the most important is the lessening of urban primacy, a slowdown in the growth of mega-cities and the growth of intermediate-sized cities and the multiplication of their numbers (Economic Commission for Latin America and the Caribbean [ECLAC], 2012; Lattes, 2001).

Another disruption is seen in internal changes in urban structure. Although large cities and metropolitan areas are still attracting population and concentrating the core of the economy and activity around the world, important transformations can be seen in the metropolitan city model. There is an unprecedented dispersion of urbanization, with cities spread into new dispersed and fragmented peripheries, subject to the powerful dynamics of privatization and segregation (Arellano and Roca, 2010; Borsdord, 2003; ECLAC, 2012; Cunha et al., 2006; García Palomares and Gutiérrez Puebla, 2007; Janoschka, 2002).

The metropolization of many of the Latin American cities finds its origins in the growing expansion of the urban area in the main city and the consequent emergence of different types of urbanizations on the edges of the city. This first involved the relocation of poor and middle strata towards the outer rings of the city and, later, the displacement of middle and upper strata families towards specific areas of the periphery (Rodríguez, 2009). This phenomenon of peri-urbanization impacts most of the neighboring localities, which become integrated into the phenomenon of the peripheral conformation. The metropolitan territory thus emerges as a highly heterogeneous space with diffuse borders.

One of the possible strategies for approaching metropolitan expansion and recent urban restructuring processes is the study of internal migration flows, particularly those that take place between cities within the same metropolitan space. This type of migration, also known as residential mobility, is a key element of the quantitative and qualitative change processes that metropolitan cities of the region are experiencing, and is due to two reasons. The first is that it involves a large number of people, so it can produce rapid alterations of the population size of certain cities. The second is that the migratory selectivity of the flows modifies the characteristics of the areas of origin and destination (Rodríguez, 2011).

This article therefore tries to return to the importance of the complex relationship between demographic and urban dynamics, with its main aim *being to estimate patterns and flows of recent intra-metropolitan migration in nine medium-sized metropolitan cities of Argentina, Brazil and Mexico, according to data from the 2010 censuses, as well as to analyze how migratory selectivity may be modifying the socio-demographic composition of these areas.*

Background

For decades spatial population movements in LA were dominated by rural-urban migration, however, as a result of increasing urbanization, internal migration patterns were reshaped and currently migrations between urban areas are the predominant flow (Cerrutti and Bertonecello, 2003; Rodríguez and Rowe, 2018). Mainly, intra-metropolitan migrations have gained significance and are recognized as the key element of the socio-demographic changes in

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cities, and its effects respond fundamentally to the magnitude and, above all, to the selectivity of migratory flows.

Previous studies in the region, mostly focused on mega-cities and their metropolitan areas, indicate that changes in migration patterns, in particular internal migration, were fundamental to attenuate the pressure on metropolises and the process of metropolitan growth. In general, although it is difficult to support that Latin American cities system area facing a significant demographic decentralization process, the evidence shows that important changes do exist and a more complex city system is emerging as well as a more diverse migration pattern (Chavez et al., 2016; Cunha and Rodríguez, 2009; ECLAC, 2014; Rodríguez, 2009; 2011, 2017; Rodríguez and Rowe, 2018).

These studies note that, in most Latin American metropolises, the secondary towns comprising them are experiencing population growth in recent decades that is higher than the main city, with the main source being the centrifugal-type migrations originating in this city. While the net in-migration rates of several cities still exceed an annual mean of 20 per 1000 annual average, although with clear signs of moderation in this in the decade of 2000, the majority of the central areas of these metropolises recorded net out-migration (ECLAC, 2014). In LA, the migration is associated with specific spatial processes, instead of general processes, because in some cases drives genuine deconcentration (i.e., Mexico City, Costa Rica) but in other cases drives concentrated deconcentration (i.e., Montevideo, Rio de Janeiro, São Paulo) and in a few cases drives concentration or configuration of new forms of centrality (Chávez et al., 2016).

Also most urban theories see a break in migratory dynamics, directed in Latin American countries not only by the economic crisis of the 1980s and 1990s, but also by the reduction of population pressure in areas of greater economic and social backwardness because of the drop in fertility. This break translates into a persistent geographic expansion of major cities, making their effective geographical boundaries much more diffuse. At this stage, an expansion of the spatial scale of the metropolitan area can be seen (Chávez et al., 2016).

One example is that of metropolitan regions undergoing suburbanization, where out-migration of people from large cities to nearby localities, but maintain a strong functional link with the main city, is tending to create extended metropolitan areas. According to Lambregts (2009: 251), this process, also known as 'concentrated deconcentration', "...refers to the spatial process whereby people, jobs and/or other resources move away from an urban center –not to spread out uniformly over space (i.e., the process known as sprawl) but to 'reconcentrate' in smaller centers at some distance away)". This is a complex process that can take many different forms. In LA, this tendency has traditionally been manifested in rapid growth on the outskirts of metropolises and despite having above-average development indices these regions, especially its main cities, lose population because of a lack of space for residential use, worsening quality of life or urban policies and regulations (ECLAC, 2010).

Another example, may be directly related to the 'concentrated deconcentration' hypothesis, is when emigrants from metropolitan regions move to areas that have few resources but are near enough to these regions from regular contact with them, as part of a process of suburbanization or the creation of low-density cities (ECLAC, 2010).

A fundamental dimension of this debate is how migratory selectivity changes the characteristics of origin and destination areas. The understanding of internal migration and the selectivity of migratory flows has historically been based on rural-urban migration, but this conceptual framework does not necessarily apply to current migration flows, especially movements within the same metropolitan area, for two reasons. First, the attractiveness of cities to migrants is no longer guaranteed and thus relevant effects may also be caused by out-migration. Second, the predominant migratory pattern is the movements between cities and thus the migrant profile no longer corresponds to the typical in-migrant from the countryside with low educational levels, among other features (Rodríguez, 2011).

Broadly speaking, the selectivity of rural-urban migration flows is claimed to have three main effects: "(1) a *demographic window* effect, indicated by a rise in the share of working-age population (15-59); (2) a *feminizing* effect, as shown by a decrease in the local sex ratio; and (3) a *downgrading educational* effect, that is, a decline in the local levels of education in large cities" (Rodríguez and Rowe, 2018: 3).

In contrast, the shifts in internal migration patterns due to economic and political changes that LA countries experienced between the mid-1980s and 2010s do not appear to have affected the preference of young migrants for large cities but evidence suggests that the sex and educational composition of migration flows into large cities changed. Based on the literature review, Rodríguez and Rowe (2018: 3) "...conjecture that the over-representation of males and university-educated individuals in the composition of migration flows would have reduced the feminizing and downgrading educational effects that characterized the 1930s to 1970s period. At the same time, we believe that the continuation of the migration selectivity of young adults continues to have a demographic window effect on the population of large cities, increasing the local share of working-age population".

Data and methods

This study uses data from the population and housing censuses of 2010 round, the only sources available in LA for quantifying and analyzing intra-metropolitan migration. The variable "migration" used in this study corresponds to that captured at a previous fixed date, normally five years, and is known as "recent migration". This measurement enables the entire population to be situated at a certain time and place in the past, allowing rates to be calculated and actual flows to be identified, although intermediate details are lost. While this variable gives an account of the destination, the origin is captured from the question concerning the place of habitual residence (De facto census) or the place of enumeration (De jure census). The relevant census population includes every person over 4 years old, minus those residents abroad at the time of the census or five years earlier, and those who did not answer the question about municipality of residence five years earlier and/or usual municipality of residence.

The availability of census microdata in different formats enables both variables to be processed, obtaining two types of migration matrices for each of the selected metropolitan cities. The first matrix is closed and has three origins and three destinations: the aggregate metropolitan area (operationalized as a unit that includes all the municipalities that compose it), the rest of the municipalities of the major administrative division (MAD) to which the metropolitan area analyzed belongs, and the rest of the municipalities in the country. The second matrix is also closed, but instead of the aggregate metropolitan area, includes the municipalities that compose these metropolis; therefore, its dimension will vary depending on the number of minor administrative divisions that make it up. Both matrices will enable the migratory dynamics of the selected cities to be analyzed, using two summary indicators: the net migration balance (NMB)² and the recent net migration rate (NMR)³. But, while the first matrix and its derived indicators will consider the dynamics of the metropolitan area as a whole and its migratory appeal, the second matrix will make it possible to know the patterns and flows

² Annual migration balance: represents the migratory component of the total growth of a population. The magnitude of this balance is measured by calculating the average annual difference between immigrants and emigrants of a population (Chávez et al., 2016).

³ The net migration rate is the difference between the in-migration rate and the out-migration rate. The in-migration rate is calculated as the in-migrant population of the political-administrative division (PAD) divided by five. This in turn is divided by the simple average between the population resident in the PAD at the time of the census and the resident population in the same PAD five years earlier. Finally, it is multiplied by a thousand. The in-migrant population is that which comes to live in the PAD from another PAD, within the five years prior to the census. The out-migration rate is calculated similarly to the rate of in-migration, with out-migrants in the numerator (Chávez et al., 2016).

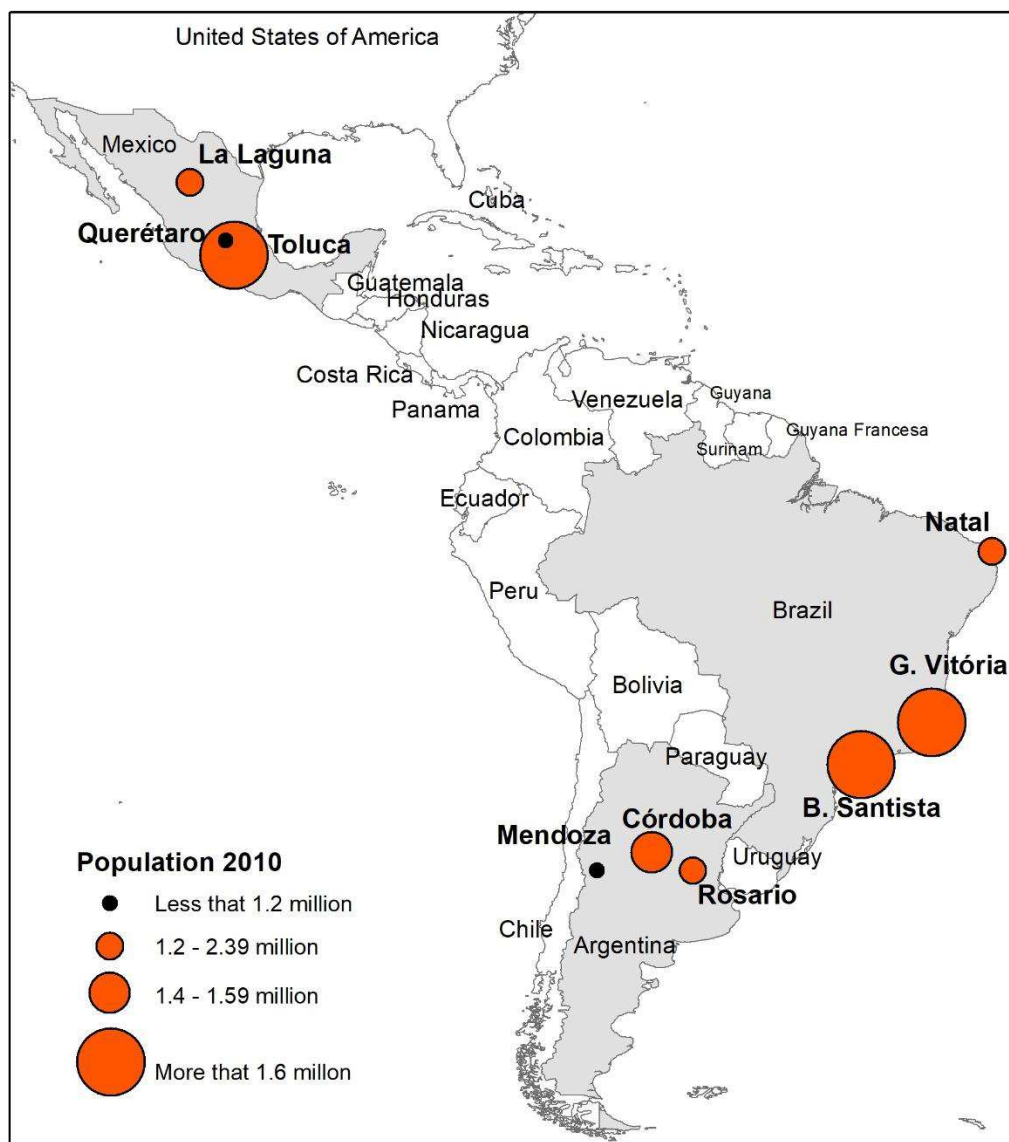
of intra-metropolitan migration within each of the metropolitan areas, identifying areas of attraction and expulsion.

Since migration affects not only the growth of the cities, but also influences its structure as a result of the selectivity of the displacements, the effects of migration (in-migration and out-migration) on the characteristics of the population in the origin and destination areas will be estimated. However, as Rodríguez (2009) argues, demonstrating this impact is not easy, firstly because of the information requirements this demands and then for the methodological complications involved. It will work with a procedure proposed by the Latin American and Caribbean Demographic Centre (CELADE – Population Division of ECLAC), which is based on comparing the marginals of the matrices of flow indicators and determine on that basis whether the migration had a positive or negative effect (net and exclusive) on the attribute (ECLAC, 2007)⁴. From this procedure, three derived matrices and flow indicators will be constructed for three individual characteristics of internal migration: sex, age and educational composition, using three indicators: the ratio of males to females in the population to measure changes in sex composition, the share of population in five age bands (5-14, 15-29, 30-44, 45-64, or 65+ to estimate changes in age structure, and the average years of schooling for population aged 30+ and householders.

The definition and delimitation of metropolitan areas are matters of great importance for the study of territorial structure and dynamics. In this study, we used already existing constraints-based definitions, developed by governments. Our interest in this work was to study what happened in medium-sized metropolitan cities of LA, with a population of between one and two million inhabitants –very little studied–; for this, we selected those which are not capitals of the country and which are formed by at least 4 municipalities, in order to obtain greater diversity of inter-metropolitan migratory flows. Nine metropolitan areas were therefore included in this study, located in three different countries: Córdoba, Mendoza and Rosario (Argentina), Grande Vitória, Baixada Santista and Natal (Brazil), La Laguna, Querétaro and Toluca (Mexico) (Map 1).

⁴ “One of the marginals corresponds to the attribute at the time of the census, i.e. when the effect of migration has actually occurred, and the other corresponds to the same attribute, but with the territorial distribution that it would have if there had been no migration during the reference period. It is a comparison between a current, observed scenario and a hypothetical scenario. The key assumption of the procedure is the permanence of the attribute over time (which is guaranteed for variables such as sex) or the uniform variation across the entire population (which is guaranteed for variables such as age)” (ECLAC, 2007: 213).

Map 1. Selected medium-sized metropolises by population, 2010 census round



Source: Own elaboration.

Results

Demographic characteristics of selected medium-sized metropolises

All medium-sized metropolises studied have expanding populations, though growth rates are slowing and have dipped below 1% in some cases. Between 1990 and 2010, these nine metropolitan areas increased their population size from 10.9 to 12.7 million inhabitants, which mean an average annual growth rate of 1.8%. While in 1990 the most populated metropolitan areas were Baixada Santista and Greater Córdoba with about 1.2 million inhabitants, in 2010 Toluca almost reached two million inhabitants, follow by Baixada Santista and Grande Vitória with almost 1.7 million (Table 1).

In absolute terms, the Metropolitan Area of Toluca increased its population in 825 thousand people and Greater Rosario only in almost 143 thousand inhabitants. In relative terms, the most dynamic metropolitan area is Querétaro, with an annual rate of 3.2%, follow by another Mexican metropolitan area (Toluca).

Table 1. Selected medium-sized metropolises by population and annual growth rate (%), 1990, 2000 and 2010 census round

Country	Metropolitan Area	Census Round			Annual Growth Rate (%)		
		1990	2000	2010	1990-2000	2000-2010	1990-2010
Argentina	Córdoba	1 218 241	1 368 301	1 454 645	1.2	0.7	0.9
Argentina	Mendoza	770 143	986 341	1 086 633	2.5	1.1	1.8
Argentina	Rosario	1 095 906	1 161 188	1 239 346	0.6	0.7	0.6
Brazil	Baixada Santista	1 220 249	1 476 820	1 664 136	2.1	1.2	1.6
Brazil	Grande Vitória	1 136 842	1 438 596	1 687 704	2.7	1.6	2.1
Brazil	Natal	892 132	1 124 669	1 351 004	2.6	1.9	2.2
Mexico	La Laguna	878 289	1 007 291	1 215 817	1.4	1.9	1.6
Mexico	Toluca	1 110 492	1 540 452	1 936 126	3.3	2.3	2.8
Mexico	Querétaro	579 597	816 481	1 097 025	3.5	3.0	3.2

Source: Own elaboration on the basis of special processing of census microdata.

Population growth consists of two components: one, natural (which equals the difference between births and deaths) and another, social (which equals the difference between immigrants and emigrants). The social component is more relevant the smaller the size of the territory analyzed. Thus, before exploring the internal migration of the study areas, the net growth rates of the total population and that of the five years and more during the last intercensal period is compared.

In almost all agglomerates, except in Greater Rosario, the growth rate of persons aged five years or over exceeds the growth in the total population, which would be explained by the demographic transition that has occurred in almost all of them. Over the course of this transition, this can be explained by the fact that the migration made the major contribution to population growth (Table 2).

Table 2. Selected medium-sized metropolises: five-year-old population or over and total population and annual growth rate (%), 2000 and 2010 census round

Country	Metropolitan Area	2000		2010		Annual Growth Rate (%)	
		Five-year-old or over	Total population	Five-year-old or over	Total population	Five-year-old or over	Total population
Argentina	Córdoba	1 248 387	1 368 301	1 338 910	1 454 645	0.8	0.7
Argentina	Mendoza	897 712	986 341	992 139	1 086 633	1.1	1.1
Argentina	Rosario	1 074 533	1 161 188	1 105 685	1 239 346	0.3	0.7
Brazil	Baixada Santista	1 348 651	1 476 820	1 552 638	1 664 136	1.4	1.2
Brazil	Grande Vitória	1 307 575	1 438 596	1 569 884	1 687 704	1.8	1.6
Brazil	Natal	1 013 561	1 124 669	1 254 210	1 351 004	2.2	1.9
Mexico	La Laguna	886 526	1 007 291	1 080 882	1 215 817	2.0	1.9
Mexico	Toluca	1 304 978	1 540 452	1 718 349	1 936 126	2.8	2.3
Mexico	Querétaro	716 061	816 481	984 067	1 097 025	3.2	3.0

Source: Own elaboration on the basis of special processing of census microdata.

Recent internal migration trajectories

The migratory dynamics were analyzed with two indicators: net migration balance and annual net migration rate. All metropolitan areas analyzed, except the Metropolitan Region of Natal, have positive migration balance. In Argentina, however, we observe the lowest values, especially in Greater Córdoba where is close to zero (Table 3).

Table 3. Selected medium-sized metropolises: in-migrants, out-migrants and net migration, five-year period prior to the 2010 census round

Country	Metropolitan Area	In-migrants	Out-migrants	Net Migration
Argentina	Córdoba	58 160	-58 001	159
Argentina	Mendoza	2 854	3 193	-2 939
Argentina	Rosario	36 480	-28 478	8 002
Brazil	Baixada Santista	120 586	65 581	55 005
Brazil	Grande Vitória	111 419	59 196	52 233
Brazil	Natal	59 366	69 283	-9 917
Mexico	La Laguna	40 183	27 965	12 218
Mexico	Toluca	91 032	53 498	37 534
Mexico	Querétaro	73 084	39 045	34 039

Source: Own elaboration on the basis of special processing of census microdata.

The indicator that allows an adequate observation of migratory dynamics is NMR since it considers the difference between immigrants and emigrants and the relations with the average population of the period. Most metropolitan areas have a positive net migration rate, except Greater Córdoba with a zero rate and the Metropolitan Region of Natal with a population loss due to migration (-1.9%). The selected metropolitan areas of Brazil stand out: although all have moderate growth rates, two are an area of great migratory attraction (Baixada Santista and Grande Vitória) and one has a negative NRM (Natal) (Table 4).

Table 4. Selected medium-sized metropolises: in-migration, out-migration and net migration rates, five-year period prior to the 2010 census round (per thousands)

Country	Metropolitan Area	In-migration Rate	Out-migration Rate	Net Migration Rate
Argentina	Córdoba	8.9	8.9	0.0
Argentina	Mendoza	6.0	6.6	-0.6
Argentina	Rosario	7.0	5.5	1.5
Brazil	Baixada Santista	16.4	8.9	7.5
Brazil	Grande Vitória	14.9	7.9	7.0
Brazil	Natal	11.3	13.2	-1.9
Mexico	La Laguna	7.5	5.2	2.3
Mexico	Toluca	10.8	6.4	4.5
Mexico	Querétaro	15.7	8.4	7.3

Source: Own elaboration on the basis of special processing of census microdata.

In Greater Córdoba, and the Metropolitan Regions of Baixada Santista and Natal, the central city shows negative NMR, evidencing the population loss in the center by migration. In Mexican metropolitan areas and Greater Rosario, however, the main cities of these metropolitan areas have a positive net migration rates (Table 5).

All central cities, except Rosario, are expulsion cities for the rest of municipalities of their metropolitan area. This situation does not mean that in-migration to these cities has ceased, since the inflows are still considerable. In fact it could be interpreted as a manifestation of metropolitan expansion, as the “concentrated deconcentration” hypothesis suggests. When net migration from the cities to surrounding areas is compare to that going to the rest of the country, only Mexican metropolitan areas seem to be experiencing concentrated deconcentration. Net out-migration from these metropolitan area is due exclusively to exchanges with other municipalities within the same MAD, whereas these areas continue to gain population in migratory exchanges with the other MAD. In the other metropolitan areas,

expulsion cities are seeing net out-migration at all levels or just to the rest of the country, which means that the deconcentration is real and not apparent.

Table 5. Center city of selected medium-sized metropolises: indicators of internal migration, five-year period prior to the 2010 census round

Country	Central city	Five-year-old or over Resident population	Net Migration Balance	Net Migration Rate (per thousands)	Net migration within same MA	Net Migration with the rest of the MAD	Net Migration with the rest of the country
Argentina	Córdoba	1 206 115	-12 046	-2.0	-9 859	-4 962	2 775
	Mendoza	100 610	-7 542	-16.3	-2 294	80	-5 328
	Rosario	776 982	27 047	1.5	1 050	2 431	2 161
Brazil	Natal	764 558	-28 896	-7.8	-11 540	-16 481	-875
	Santos	399 629	-16 745	-8.7	-13 308	-1 126	-2 311
	Vitória	399 629	-16 745	-8.7	-13 308	-1 126	-2 311
Mexico	Querétaro	714 350	5 454	1.6	-9 040	1 289	19 455
	Toluca	735 150	5 312	1.5	-13 625	10 258	8 679
	Torreón ^{/al}	578 192	2 453	0.9	-1 353	1 972	1 834

Source: Own elaboration on the basis of special processing of census microdata.

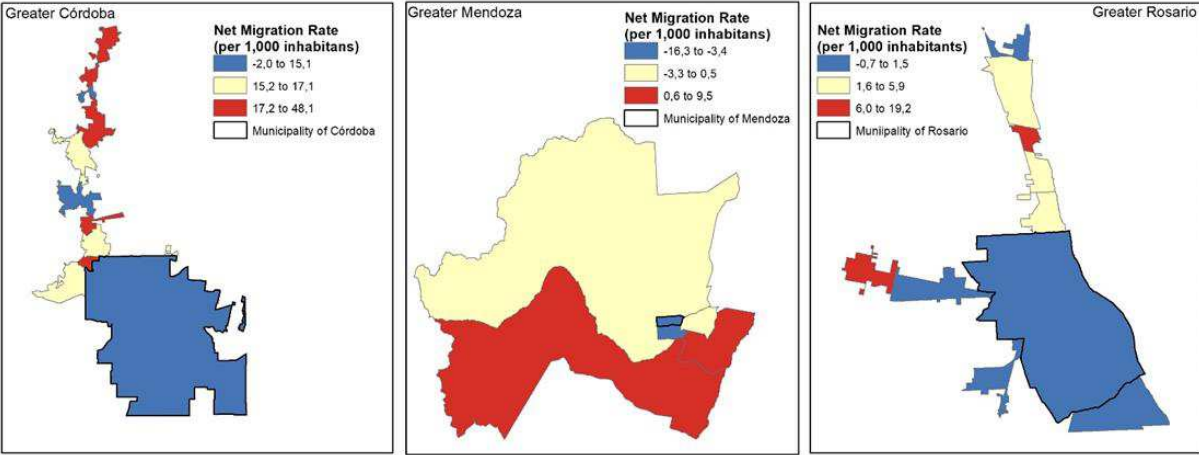
Note: MA: metropolitan area - MAD: major administrative divisions

^{/al} Torreón is the main city of Metropolitan Area of La Laguna

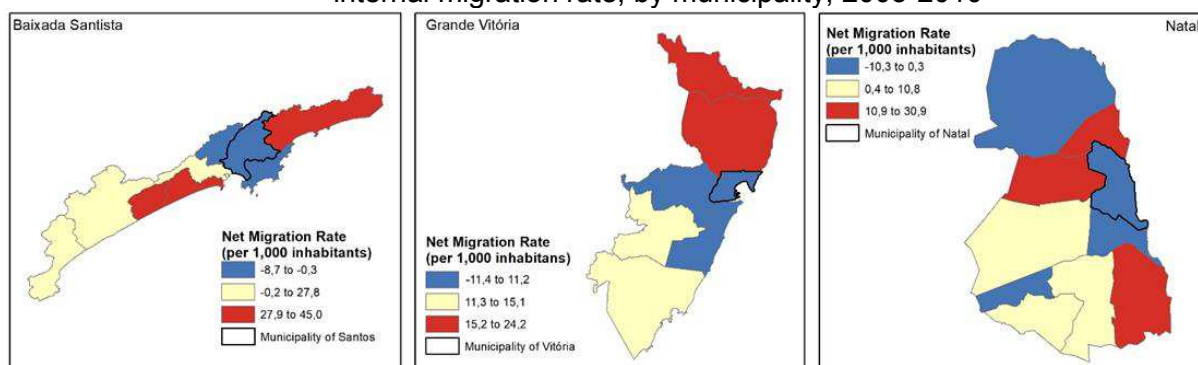
Map 2 illustrates the situation at the minor administrative divisions level for the nine selected metropolitan areas. While peripheral tend to pull in-migrants, central ones have a push effect. Even so, a variety of migration patterns were observed in both central and peripheral areas, a diversity that is likely to be increasing in several cities.

Map 2. Selected medium-sized metropolises: minor administrative divisions by average annual net migration rate (per 1,000 inhabitants), five-year period prior to the 2010 census round^{/al}

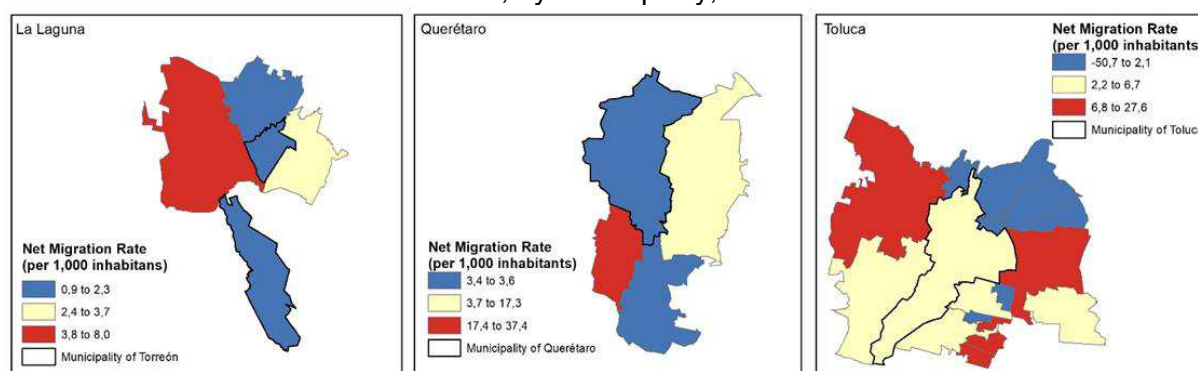
(A) Argentina. Greater Córdoba, Mendoza and Rosario: net internal migration rate, by municipality, 2005-2010



(B) Brazil. Metropolitan Regions of Baixada Santista, Grande Vitória and Natal: net internal migration rate, by municipality, 2005-2010



(C) Mexico. Metropolitan Area of La Laguna, Querétaro and Toluca: net internal migration rate, by municipality, 2005-2010



Source: Own elaboration on the basis of special processing of census microdata.
 Note: ^{1a/} The categories used in each map refer to terciles of the distribution of municipalities or boroughs, according to population growth rate. Borders outlined in bold denote the central minor administrative division or main city.

Effects of internal migration on the socio-demographic compositions of population

Table 6 shows the net and exclusive effects of internal migration on the age, sex, and educational population compositions of selected metropolitan areas and its central cities. In general, this indicator of difference relative to the initial level of the analyzed attributes is low, but regarding the sense of impact, some regularities are appreciated.

Table 6. Net and exclusive effect of internal migration on socio-demographic composition of selected metropolitan areas and its central cities, five-year period prior to the 2010 census round (Percentages)

Metropolitan Area (MA)		Sex ratio	Average age	Average years of schooling (population aged 30-years-or-over)	Average years of schooling (heads of household)	Heads of household with low education level	Heads of household with high education level
Gran Córdoba	All MA	-0,2	0,0	-0,9	-0,7	-1,4	-5,2
	Main city	-0,4	0,5	-3,0	-2,6	-1,0	-6,2
Gran Mendoza	All MA	-0,1	0,2	-0,3	-0,5	-0,3	-1,0
	Main city	-0,7	2,1	-0,8	-0,5	-5,6	-4,1
Gran Rosario	All MA	0,0	-0,3	-0,7	-0,6	-0,3	-3,1
	Main city	-0,1	-0,4	-1,2	-1,1	-0,5	-3,6
Baixada Santista	All MA	-0,3	0,3	ND	ND	-1,1	1,2
	Main city	-1,4	0,9	ND	ND	-2,3	2,8
Grande Vitória	All MA	0,5	-0,6	ND	ND	-0,4	1,2
	Main city	-1,0	0,6	ND	ND	-5,8	5,9
Natal	All MA	0,1	-0,1	ND	ND	1,1	-2,7
	Main city	-0,1	0,1	ND	ND	1,0	-2,6
La Laguna	All MA	-0,5	-0,3	-0,2	-0,1	0,3	-0,8
	Main city	-1,4	-0,3	-0,2	-0,3	0,9	-0,6
Toluca	All MA	-0,3	0,1	1,3	1,5	-1,7	6,1
	Main city	-4,6	0,2	1,4	1,4	-2,8	6,5
Querétaro	All MA	-1,0	0,3	1,0	1,3	-2,3	3,8
	Main city	-1,3	0,3	-0,4	-0,0	0,6	-0,5

Source: Own elaboration on the basis of special processing of census microdata.

Note: ND: no data.

First, an analysis of how migration affects the territorial distribution of the population by sex reveals that migration operated to reduce the local sex ratio by increasing the share of the female population, especially in central cities. These reductions are particularly pronounced in the Mexican metropolitan areas of La Laguna and Querétaro, showing a decrease of 0.5 and 1.0 per cent in the sex ratio, respectively. In contrast to what was observed for large cities (Rodríguez and Rowe, 2018), these results indicate that internal migration continued to have a *feminizing effect* on the demographic structure of selected metropolitan areas during the second half of the 2000s. These patterns appear to be largely driven by over-representation of females in in-migration flows, in particular to those who have the main cities of selected metropolitan areas as a destination.

Second, for the 2005-2010 period, internal migrations tended to increase the average age of the population, except in Greater Rosario and Metropolitan Area of La Laguna. This *demographic window effect* of internal migration is expected to continue as Latin American countries move to more advanced stages of the demographic and urban transition (Rodríguez and Rowe, 2018).

The relative differences for population aged 5-14 (children), 30-44 and 45-59 (working age), and 60+ (older people) are negative, indicating that internal migration reduce the share of these age groups in the local populations of almost all selected metropolitan area. There were large variations in the extent of these reductions. Internal migration appears to have generated the

largest reductions in Greater Córdoba and metropolitan region of Grande Vitória, leading to a reduction of nearly 2 per cent in the share of children in both metropolitan areas, and 2 per cent in the share of older people in Grande Vitória. Reductions were marginal in Argentinean metropolitan area of Mendoza, with internal migration producing changes of less than 0.5 per cent. There were also exceptions to this downward trend: in Greater Mendoza and metropolitan areas of Baixada Santista Querétaro the internal migration expanded the population aged 45-59 and 60+, and share of children in La Laguna (Table 7).

Table 7 also shows that among main cities, stands out the ageing effect in Greater Mendoza where the share of children decrease nearly 9 per cent and the population 60 years and older increase 2.4 per cent due to internal migration in 2005-2010 period.

Table 7. Net and exclusive effect of internal migration on age structure of selected metropolitan areas and its central cities, five-year period prior to the 2010 census round (Percentages)

Metropolitan Area (MA)		Population aged				
		5-14	15-29	30-44	45-59	60+
Gran Córdoba	All MA	-1,7	4,1	-3,1	-0,7	-0,5
	Main city	-2,1	4,7	-4,3	-0,5	0,1
Gran Mendoza	All MA	-0,4	0,4	-0,6	0,2	0,3
	Main city	-8,6	4,1	-5,7	3,8	2,4
Gran Rosario	All MA	-0,6	2,2	-1,4	-0,6	-0,8
	Main city	-0,9	2,9	-2,2	-0,5	-0,9
Baixada Santista	All MA	-1,3	0,5	-0,5	0,2	1,8
	Main city	-1,3	-0,5	-2,1	0,8	3,0
Grande Vitória	All MA	-1,7	3,0	0,0	-1,7	-2,0
	Main city	-2,6	1,3	-1,3	1,3	1,5
Natal	All MA	-0,4	1,4	-1,5	-0,2	0,2
	Main city	-0,7	1,7	-2,1	0,2	0,9
La Laguna	All MA	1,7	-0,9	0,1	-0,6	-0,6
	Main city	2,2	-1,6	0,4	-0,5	-0,4
Toluca	All MA	-0,2	-0,7	1,3	-0,1	-0,9
	Main city	0,3	-1,8	2,0	-0,8	0,8
Querétaro	All MA	-1,4	0,5	-0,0	0,3	1,5
	Main city	-1,5	0,8	-1,2	0,9	2,4

Source: Own elaboration on the basis of special processing of census microdata.

These reductions reflected in a concomitant expansion in the share of young adults aged 15-29. The biggest percentage increase can be observed in Greater Córdoba and in the main city of Greater Mendoza, both located in Argentina.

This ageing process is not due to a loss of migratory attractiveness of metropolitan areas for young adults (population aged 15-29), but to an outstanding net out-migration of children and working-age population (ages 30 to 44), which indicates a reduction in the attractiveness of these areas for families in the process of raising children.

Lastly, Table 6 shows that internal migration tended to have a *downgrading effect on education* by reducing the average years of schooling for two population sub-groups (population aged 25+ and householders) in local populations of all Argentinean selected metropolitan areas and Mexican metropolitan area of La Laguna. A more detailed analysis of the migration matrices

reveals a tendency for more educated people to leave metropolitan areas and, in some cases, the main city of these areas in Argentina, Brazil⁵ and Mexico.

Preliminary conclusions

Recent census information on net migration and net migration rates in medium-sized metropolises indicates that migration between central city and the other cities in the same metropolitan area could be gaining importance as a factor in the demographic and territorial growth of medium-sized cities.

Also marked contrasts between trends in the cities centers (as migration senders) and in peripheries (as receivers) were observed. Annual net migration rates exceeds 6 per 100 inhabitants in the peripheries of several metropolitan areas, values higher than those observed in the metropolises (ECLAC, 2014).

The main conclusion from the analysis of migratory flows was that 'concentration deconcentration' hypothesis only appeared to be operating in the metropolises of Mexico. The migratory patterns of these areas that are still attracting migrants fit the concentrated deconcentration hypotheses and are apparently a manifestation of ongoing suburbanization, as observed in Guatemala City and Quito in 1995-2000 period (ECLAC, 2010).

Almost all main cities of Argentinean and Brazilian metropolitan areas have a push effect and expulse population to nearby localities within the metropolitan area, supporting the 'concentrated deconcentration hypothesis. However, when analyzing migratory flows to cities outside the metropolitan area, inside and outside the same MAD, it is observed that in some cases, such as the Brazilian, deconcentration is real.

The estimated impacts were generally small, echoing the inertia of human settlement patters in large cities, but systematic patterns emerged. On the one hand, the selectivity of internal migration, in particular migratory flows to and from main cities, tended to reduce the local sex ratio, average years of schooling, and the proportions of children and older people in the local population of selected metropolitan areas. On the other hand, internal migration increased the percentage of young adults (aged 15-29) in the same areas.

It also highlighted that the estimated impacts of migration were small in terms of the aggregate impacts on metropolitan populations. They are likely to be more acute in particular zones within metropolitan regions, in places where net migration gains and losses are concentrated. Future research is required to determine the extent of these impacts at a sub-metropolitan scale.

Since most attention has been focused on mega-cities of the region, this results may provide empirical evidence about the role of internal migrations in the urban restructuring processes of metropolitan spaces and the effects of migratory selectivity on socio-demographic composition of origin and destination areas.

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⁵ Brazilian census has no information about the years of schooling, only about the educational attainment (the highest level of education that an individual has completed).

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