

## Spatial concentration in Latin America and the role of institutions

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**ABSTRACT:** Spatial concentration in Latin America, especially in the southern cone, reaches high levels in all dimensions. Despite significant economic growth in the last two decades, trade openness, the return to democratic regimes and reductions in the Gini coefficients the primacy indexes of most Latin American countries remain relatively constant and among the highest in the world. This situation challenges most regional and urban economics theories that predict a reduction in spatial concentration as development proceeds, after an initial period of concentration. Furthermore, Latin American countries could be trapped in processes of agglomeration without growth. The objective of this article is twofold: first, we describe some characteristics of spatial concentration and its persistence in Latin America with special emphasis in the case of Chile; and second, we propose future research lines related to the need of rebalancing Latin American spatial economies focusing on the importance of institutions as an explanation of the persistence of spatial concentration.

**JEL Classification:** R12; R58; O18; O54.

**Keywords:** Spatial concentration; Latin America; spatially blind policies; institutions.

**RESUMEN:** La concentración espacial en Latinoamérica, especialmente en el cono sur, ha alcanzado niveles muy altos en todas sus dimensiones. A pesar del significativo crecimiento económico en las últimas dos décadas, apertura comercial, retorno a la democracia y reducción en el coeficiente de Gini, los índices de primacía de los países latinoamericanos permanecen relativamente constante y entre los más altos del mundo. Esta situación desafía las teorías provenientes de la economía urbana y regional que predicen una reducción en la concentración espacial a medida que avanza el desarrollo, después de un periodo inicial de concentración. Sin embargo, los países latinoamericanos parecieran estar atrapados en un proceso de aglomeración sin crecimiento. En este contexto, el objetivo de este trabajo es doble: por una parte, describe algunas de las características de la con-

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concentración espacial y su persistencia en América Latina con especial énfasis en el caso chileno; y por otra, se propone líneas de investigación futura relacionadas con la necesidad de re-balancear las economías espaciales enfocándolas en determinar la importancia de las instituciones como una explicación de la persistencia de la concentración espacial.

**Clasificación JEL:** R12; R58; O18; O54.

**Palabras clave:** Concentración espacial; América Latina; políticas espaciales ciegas; instituciones.

## Introduction

After a very rapid process of urbanization, that took around fifty years during the XX century, Latin American countries are currently the most urbanized in the world, together with the United States, with around 80% of the population living in cities (United Nations, 2014)<sup>1</sup>. One of the main traits of Latin American urbanization is the existence of remarkable spatial inequality in terms of income, access to education, health and other public and private services (ILPES-CEPAL, 2012). Furthermore, despite the natural heterogeneity among the countries of the region, most of them present high levels of spatial concentration among the main city of the urban system. In fact, primacy indexes of Latin American countries are among the highest in the world (United Nations, 2012).

Despite the high level of spatial inequality and concentration, the debate and research about inequality and redistribution in Latin America has been fundamentally considered at a national and individual scale, in a context where distance does not exist, labor and capital are perfectly mobile and territory is homogeneous in terms of factor endowments, production and access to goods and services. Furthermore, most policies have been based on the idea of «non-discrimination», according to which different individual agents should be equally treated across space, assuming that equality will be the result of that policies, at least in terms of the access to opportunities.

During the last two decades, however, individual inequality, measured through the Gini coefficient has significantly diminished in most Latin American countries (López-Calva and Lustig, 2010; Lustig, López-Calva and Ortiz-Juárez, 2013) while spatial inequality and urban concentration persists and it is probably not only a problem for equality but also for efficiency, affecting negatively national growth (Aroca and Atienza, 2012, 2013, Cuadrado-Roura and Gonzalez-Catalan, 2013). In this respect, the problem of rebalancing the spatial economy is one of the main challenges of the region from a policy perspective but also in terms of the theories and models that in urban and regional economics allow us to understand and make decisions

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<sup>1</sup> An exception to this trend is the case of many Central American countries, whose urbanization is still in process.

regarding the reduction of inequality and the development of peripheral areas. The objective of this article is to analyze the evolution of spatial concentration in Latin America with special emphasis in the Chilean case, and to propose what are the main frontiers for urban and regional economics research in the region.

The article has three sections. In the first one, we describe the evolution of demographic and economic concentration in Latin America and show how current theories in urban and regional economics are not completely appropriate to explain the persistence of spatial imbalance in the region. Afterwards, we focus on the case of Chile, which despite its level of development and recent political and economic reforms, remains as one of the most concentrated countries in Latin America. For this purpose, we adopt a historical perspective based of the way institutional frameworks could be one of the main causes of the persistence of spatial concentration in that country. Finally, in the conclusions, we analyze the main frontiers for regional and urban analysis in Latin America.

## **1. The puzzle of rebalancing the spatial economy in Latin America**

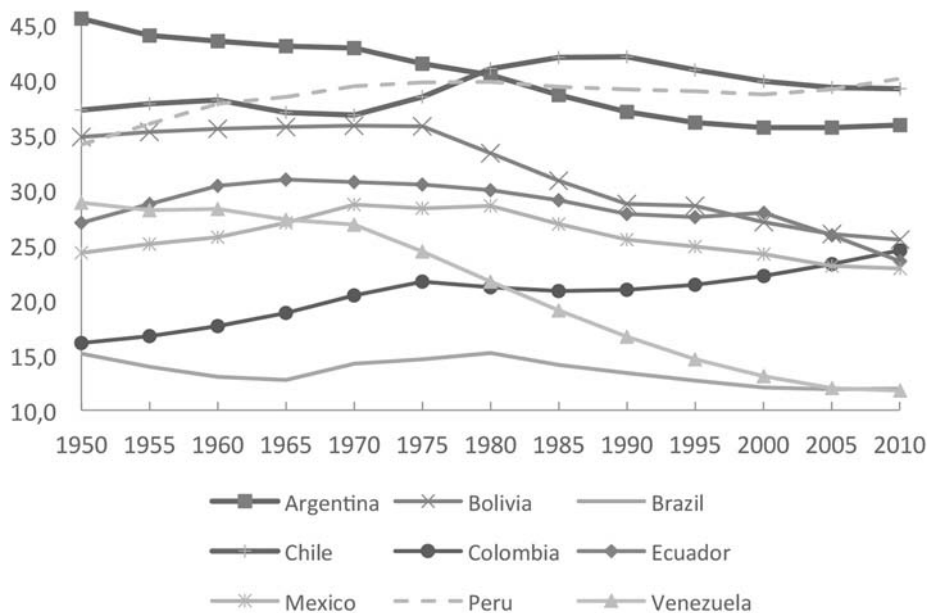
Martin (2015) has recently stressed how regional and urban economics and regional studies are not able to offer a convincing basis for understanding and devising policies capable of reversing spatial imbalance and persistent levels of geographic concentration of population and economic activity. Although Martin focuses on the experience of the increasing demographic and economic dominance of London and the South East of the United Kingdom, his arguments are particularly relevant for Latin America as it stands out as the continent with the highest urban primacy in the world (United Nations-HABITAT, 2012). Increasing spatial concentration and regional divergence has recently become a trend in some European countries and the United States (Storper, Kemeny, Makarem and Osman, 2016), but it has likely been the main feature of Latin American economic geography since the end of the XIX century (Morse, 1974; Kemper, 2002). It is also doubtful, as Martin states regarding the United Kingdom, whether we have sufficiently adequate theories and policies to achieve a more equitable geography in Latin America. More importantly, it is not clear whether the existing theories, based predominantly on the experiences of Europe and the United States, respond to the specific characteristics of the development and urbanization of Latin American countries, where a process of «agglomeration without growth» may be taking place in countries such as Chile, Argentina, Peru and Uruguay (Polèse, 2005).

Since 1980, Latin America has experienced significant transformations that should, in theory, have reduced spatial concentration and imbalances. First, the continent has completed the urbanization process and is currently the most urbanized region in the world, together with the United States, with almost 80% of the population living in cities (United Nations, 2014). Second, Latin American countries progressively abandoned Import Substitution Industrialization (ISI) policies that, according

to many authors, was the cause of urban concentration (Krugman and Livas Elizondo, 1996; Rogers, Beall and Kanbur, 2012), and widely opened their trade to the world. Third, the Latin American region has achieved a high level of democratization, following a period of dictatorships and political instability. Furthermore, the region has experienced the greatest reduction worldwide, in terms of states' fragility and warfare (Marshall and Cole, 2014). Fourth, most Latin American countries have shown relatively high economic growth rates over the last two decades and many of them have achieved a medium level of development of GDP per capita (Penn World Tables 9.0). Finally, since the beginning of the XXI century, income inequality, measured through the Gini coefficient, has significantly diminished in most Latin American countries (López-Calva and Lustig, 2010; Lustig, López-Calva and Ortiz-Juárez, 2013).

Increasing levels of urbanization, trade openness, democracy, growth, development and the reduction of individual inequality should reduce spatial inequality and concentration according to the available theories and previous empirical studies (Wheaton and Shishido, 1981; Mutlu, 1989; Ades and Glaeser, 1995; Junius, 1999; Davis and Henderson, 2003; Henderson, 2003; Moomaw and Alwosabi, 2004; Bertinelli and Strobl, 2007; Henderson and Wang, 2007; Barrios and Strobl, 2009; Brülhart and Sbergami, 2009; Pholo Bala, 2009). Latin American spatial concentration, however, is the exception and remains as a puzzle to be solved. Modrego and Berdegúe (2015) analyze the changes in per-capita income, monetary poverty and income distribution in 9,045 subnational administrative units of nine Latin American countries between the mid-1990s and mid-2000s. They find a small mean household income convergence and that territorial inequality is persistent and reduces the pro-poor effect of local income growth. Furthermore, despite all of the economic and political transformations previously mentioned, the primacy indexes of the main cities in the urban systems of Latin American countries have remained persistently high since 1950, with the exceptions of Mexico, Bolivia and Venezuela, where the primacy of the main city has diminished and represents less than thirty percent of the urban population (Figure 1). In contrast, among Latin American countries, Peru, Chile and Argentina stand out as the most spatially uneven in terms of population concentration.

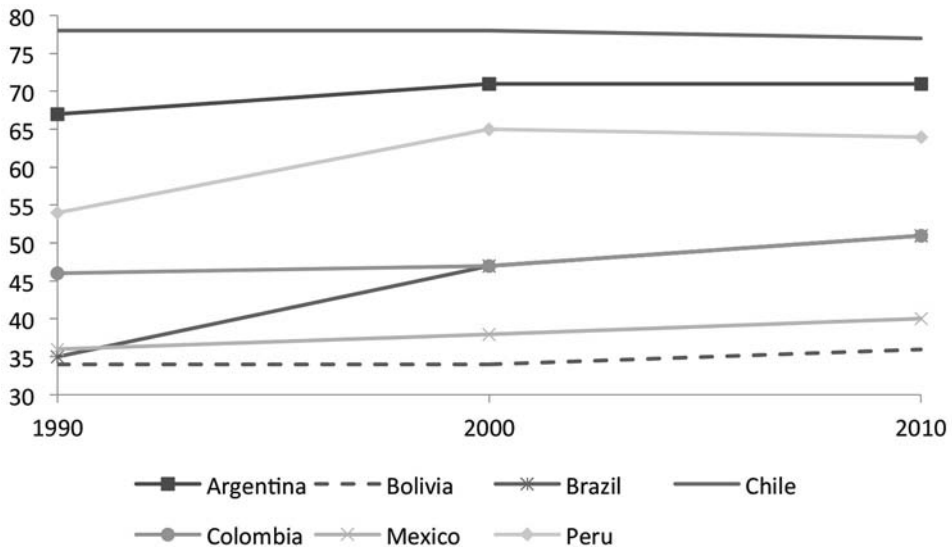
The development of Latin American countries does not seem to follow the «Williamson hypothesis» (Williamson, 1965) that predicts an inverted U relationship between GDP per capita and spatial unevenness. In contrast, many countries of the region remain during decades on the top part of this distribution. Furthermore, the role of primate cities in the urban system has significantly changed since the 1990s (Cuervo and Cuervo, 2013). During the application ISI policies, between 1930 and 1980, Latin America experienced a very rapid urbanization, characterized by the concentration of manufacturing in the main cities, according to the hypothesis proposed by Krugman and Livas Elizondo (1996) that relates the lack of trade openness with the formation of giant cities. Since the 1990, the participation of Latin American primate cities in manufacturing output has significantly declined but these cities have increased their role as financial centers and the location of most innovative activities.

**Figure 1.** Primacy index Latin America (1950-2010)

Source: Atienza and Aroca, 2013.

The case of financial activity is a perfect illustration of the current function and revitalization of primate cities in Latin America. The degree of concentration of this activity is significantly higher than the concentration of population, achieving almost 80% of financing services in Santiago (Chile), more than 70% in Buenos Aires (Argentina) and significantly increasing its participation in Lima (Peru) and Sao Paulo (Brazil), that concentrate around 50% of domestic financial services. It is important to mention that, despite the relative spatial dispersion of manufacturing, this activity is still more concentrated than population, and that the majority of peripheral areas in Latin America are still specialized in the primary sector. In this sense, Latin America reflects the idea that the world is becoming increasingly «curve» proposed by McCann (2008), according to which larger cities are increasing their relative importance due their higher connectivity and attractiveness to become the location of more knowledge intensive activities.

Explaining the persistence of spatial concentration and the way of promoting the development of peripheral areas are perhaps the main frontiers in regional and urban analysis in Latin America. Solving this puzzle is not only important in order to achieve more equality as a political and social goal. The trade-off between spatial concentration and national economic growth, mainly proposed by New Economic Geography models (Baldwin and Forslid, 2000; Baldwin and Martin, 2004), has been challenged both theoretically and empirically and particularly affects future studies on Africa and Latin America that according to Pholo Bala (2009) might

**Figure 2.** Primate city participation in financial product (1990-2010)

Source: Authors based on Cuervo and Cuervo, 2013.

currently be in a «concentration trap» that reduces efficiency and growth. In fact, most empirical works on the relationship between spatial concentration and national growth (Henderson, 2003; Bertinelly and Strobl, 2007; Brulhart and Sbergami, 2009; Pholo Bala, 2009, Atienza and Aroca, 2012) show that in countries such as Chile, Argentina, Peru, Uruguay as well as most Central American countries, spatial concentration is negatively affecting national growth. These results, however, are fundamentally empirical and we lack theories to explain how the spatial dispersion of economic activity and population occurs and can be promoted, taking into account the particular characteristics of the development and urbanization processes of Latin American countries.

Regional and urban economics models that try to explain agglomeration and concentration processes have been predominantly based on the interaction of market mechanisms related to the allocation of resources and the mobility of factors in a context of increasing returns to scale. From this perspective, consequently, there has been a tendency to consider spatial concentration as a market equilibrium. This view, however, has also been challenged and history, institutions and policy have increasingly gained importance in explaining spatial concentration and its potential persistence. Davis and Henderson (2003) and Henderson and Wang (2007) emphasize the role of the institutional framework in the persistence of high levels of concentration. These works highlight the concept of favoritism, understood as an institutional framework that favors the persistence of concentration, due to an asymmetric regional distribution of public investment and an assignment of export licenses and restrictions on capital markets that favor the main city (Davis and Henderson, 2003). Vargas

and Atienza (2016) propose that the existence of historical and current institutional frameworks can also organize territories in an extractive way, ensuring the predominance of some places over others. In this sense, the concentration of political and economic power in an elite that is habitually located in the most important urban centers, can reinforce an institutional framework characterized by favoritism and accentuate spatial inequality. From this perspective, they find that having been a Spanish colony increases primacy.

Martin (2015) stressed the need for an historical and institutional approach to understand the forces that shape the economic geography of a country, particularly in regards to the persistence of concentration. From this perspective, in the next section we will analyze the case of Chile, which possesses one of the highest levels of primacy in the continent. This case is of particular relevance, because spatial concentration has remained constant over the last two decades, despite significant economic growth and development, the return to democracy and a clear policy of trade openness. Furthermore, all empirical studies on the relationship between concentration and growth show that Chile might be in a «concentration trap», a process of agglomeration without growth, or growing under its potential.

## **2. The Chilean laboratory of spatial imbalanced growth**

Chile has been taken by many scholars and practitioners as a successful experience of development from a macroeconomic perspective. Most attention on the so called «Chilean miracle» has been paid to structural stability, growth and reduction in poverty rates. In contrast, inequality both at an individual and spatial level has received until recently scant consideration, despite its high levels, among the highest in the world, perhaps because the lack of success in these aspects. In fact, Chile stands as a classic instance of spatial inequality and persistence of concentration despite economic growth and development. Curiously, current urban system closely resembles late XIX century Chilean spatial organization of the economy when natural resources export dependency inhibited the growth of peripheral regions, in many cases organized as small size enclave towns, while Santiago, the capital, concentrated most economic, political and cultural power (Morse, 1974). Regional and urban economics theories predominantly based on the idea of spatial market equilibrium are not able to explain why the economic geography of Chile is not more balanced nowadays, probably because that geography is not a market result. In this respect, it is more plausible to think of a path dependent process, that started at the end of XIX century, reinforced by an extremely centralist institutional framework and a set of spatially blind national policies that, based on the idea of non-discrimination among individuals, have reduced the opportunities and capabilities of people living in peripheral regions and can also be reducing efficiency and national growth. In this section we will analyze the historical roots and evolution of spatial concentration and some institutional mechanism that can be currently contributing to the persistence of this concentration.

## 2.1. Evolution of spatial concentration in Chile

From a historical perspective, Spanish colonial rules created a form of territorial dominion based on administrative cities of the viceroys that acted as units of power and surplus extraction from the periphery (Chase-Dunn, 1984). Colonial urban systems ensured the flow of goods to the main ports and navigable rivers while little effort was made to create cities in the areas of exploitation, which were organized as plantation and enclave economies (Kemper, 2002). After the independence, Latin American countries needed several decades to achieve the unification of the majority of states due to the absence of institutional mechanisms of agreement among rival groups (North, Summerhill, and Weingast, 2000). Chile was one of the first Latin American states to achieve unification thanks to Diego Portales that established an authoritarian and strongly centralized Constitution in 1833 (Boisier, 2000). Portales Constitution, whose influence extends to the xx century, reinforces the colonial territorial model based on a core-periphery pattern where the main city was a center of political and economic clientelism where commercial and financial intermediaries prospered and landowning elites enjoyed urban amenities while peripheral cities remained as primary export oriented economies (Morse, 1974).

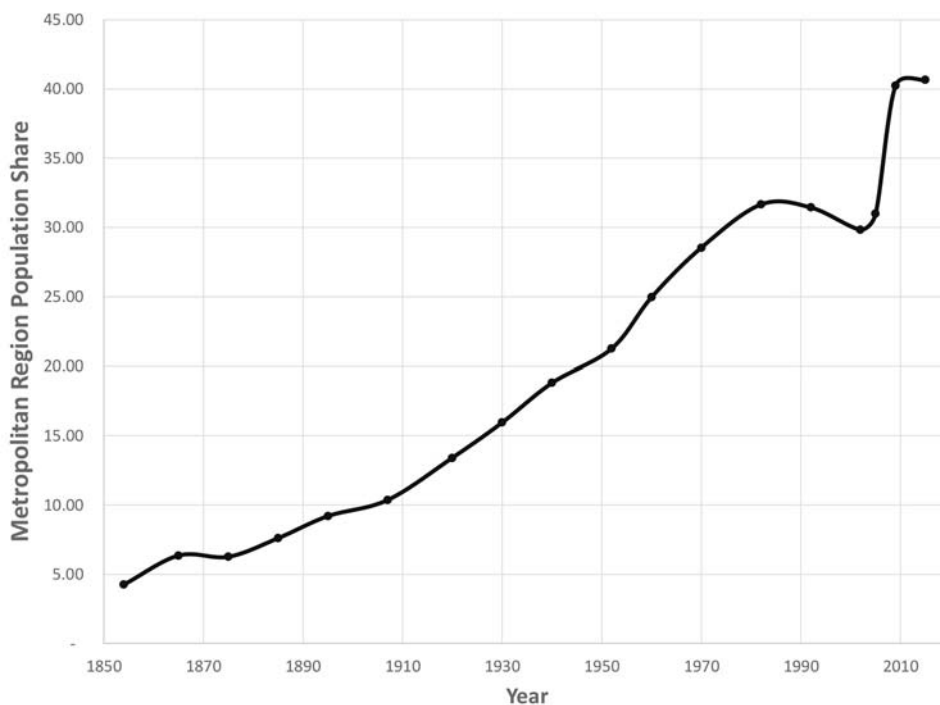
At the beginning of the xx century, Chilean was predominantly a rural country and the level of demographic concentration in Santiago was relatively low, around 11% of total population (Figure 3). A process of path dependence, however, had already started, that would be evident during the next decades as the rapid urbanization of Chile proceeded. During the first four decades of the xx century the participation of Santiago in total population consistently increased, but the Chilean urban system was not very asymmetrical and followed the Zipf law<sup>2</sup> (Figure 4). The asymmetry of the Chilean urban system started to grow sharply from 1940s<sup>3</sup> when the urbanization process accelerated, ISI policies were applied and manufacturing activity significantly increased. At the beginning of the 1970s, Chile had already finished its process of urbanization and the demographic concentration in the Metropolitan Region was over 30% of total population (Figure 3). This process of agglomeration followed in general the predictions of standard theories of urban and regional economics. During the Pinochet's dictatorship, between 1973 and 1990, the spatial concentration continued to grow but at a slow pace, mainly because economic crisis in the seventies and especially in 1982 principally affected the economy of the Metropolitan Region. Paradoxically the return to democracy brought a significant rise in primacy rates that increased from 32% of total population to 40% in just a decade, between 1992 and 2002 (Figure 3). At that point, the Chilean urban system did not follow the Zipf law due to the high level of asymmetry (Figure 4). It is interesting that during this period Chile was highly urbanized, had returned to democracy, was a broadly open economy and experienced significant GDP growth. Despite this last period is still relatively short, it seems that there is no sign that concentration is significantly di-

<sup>2</sup> Zipf coefficient was close to 1, which means that the first city in the system is twice the second in terms of population, three times the third city and so on.

<sup>3</sup> This is manifested in the reduction of the Zipf coefficient below 1.

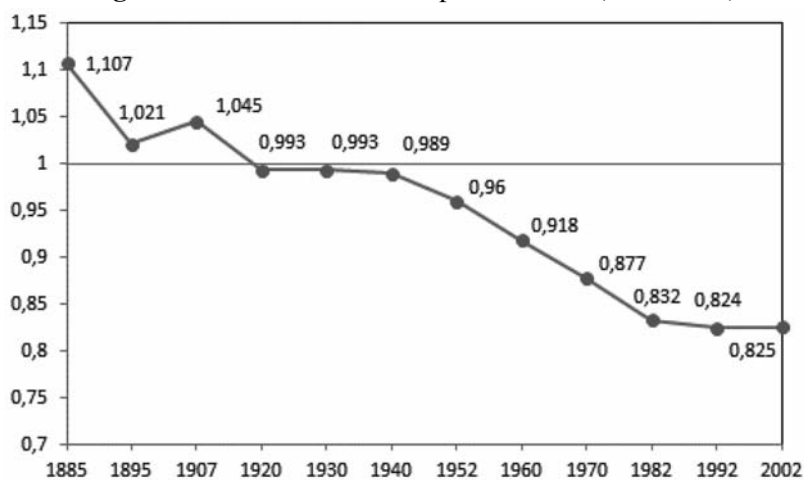


**Figure 3.** Concentration of total population in the Metropolitan Region (1865-2009)



Source: Authors elaboration based on Chilean Census and CASEN 2009 and 2015.

**Figure 4.** Evolution of the Zipf coefficient (1885-2002)



Source: Vallone y Atienza, 2012.

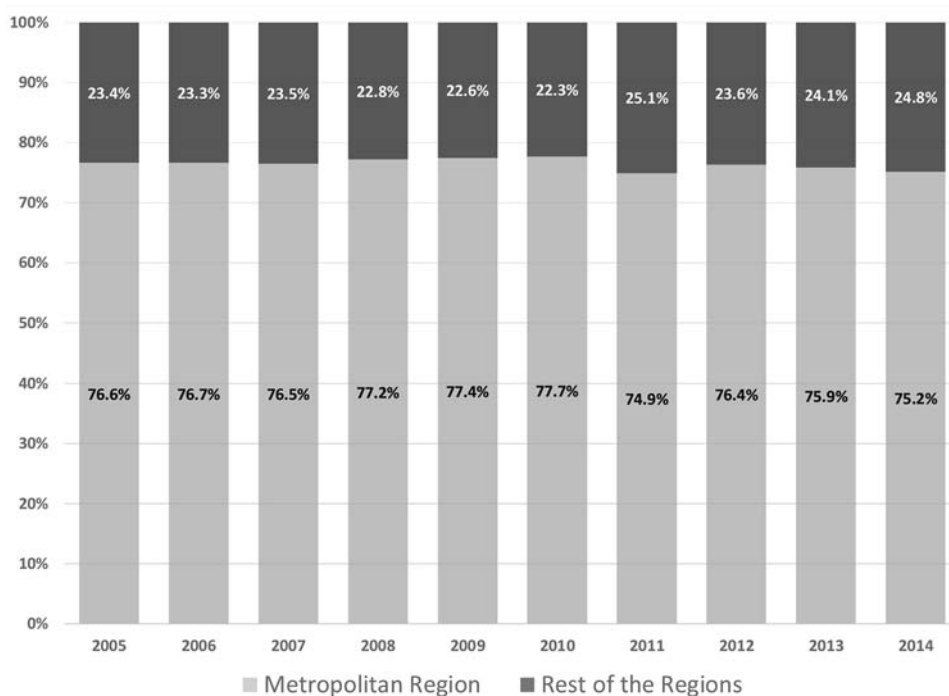
minishing. Why does spatial concentration remain so persistent in this context? In this case, standard urban and regional theories do not offer convincing answers and institutional and political factors, normally absent in those theories, seem to be the most appropriate explanation.

## **2.2. The role of institutions in the persistence of spatial concentration in Chile**

In September 1973, the same month of Pinochet's coup d'état, John Friedmann analyzed the spatial organization of power in Chile and its effects on the development of urban systems. His analysis reinforced the idea of spatial path dependence related to the institutional framework: «the spatial distribution of governmental power influences the location decisions during the early phases of industrialization and the growing interpenetration of governmental and private economic institutions channels the subsequent location decisions of individuals and households to locations of central power in excess of objective opportunities for productive employment». This type of argument has been defended by many authors regarding the strong influence of the centralist Constitution promulgated by Diego Portales in 1833 in the current economic geography of Chile (Boisier, 2000). In fact, Chile still has an extremely centralized state organization especially in terms of political and fiscal decentralization. Surprisingly, despite the importance of institutions in economic geography we lack theories explaining the channels and mechanisms through which institutions can affect the spatial organization of an economy and can perpetuate high levels of concentration. In this section we will briefly analyze four aspects of the economic geography of Chile (the property of capital, the location of qualified human capital, the innovation expenditure, and the central government purchasing system) and how the institutional design could be promoting concentration.

### **2.2.1. Ownership and concentration of capital**

In Chile, it is difficult to find information on the ownership of capital and even more so regarding its territorial distribution. Nonetheless, there is a suitable proxy that can be obtained via a database created by the Internal Taxes Service (SII for its abbreviation in Spanish) and that is available from the year 2005 to 2014. This database contains the sales levels for all Chilean firms that are subject to paying the value added tax (IVA). The information is disaggregated at a regional level, assigning to each region not the sales realized there, but rather the sales conducted by the firms that were started in that region. As in Chile the initiation of activities is generally done in the region where the owner lives, the distribution of regional sales in the territory provides a good approximation of how the ownership of capital is distributed throughout the territory and probably even more importantly, the revenue derived from it. Figure 5 shows the spatial distribution of the ownership of the sales from the Metropolitan Region and the rest of the country's 14 regions, clearly indicating two

**Figure 5.** Evolution of the Ownership of Sales per Region

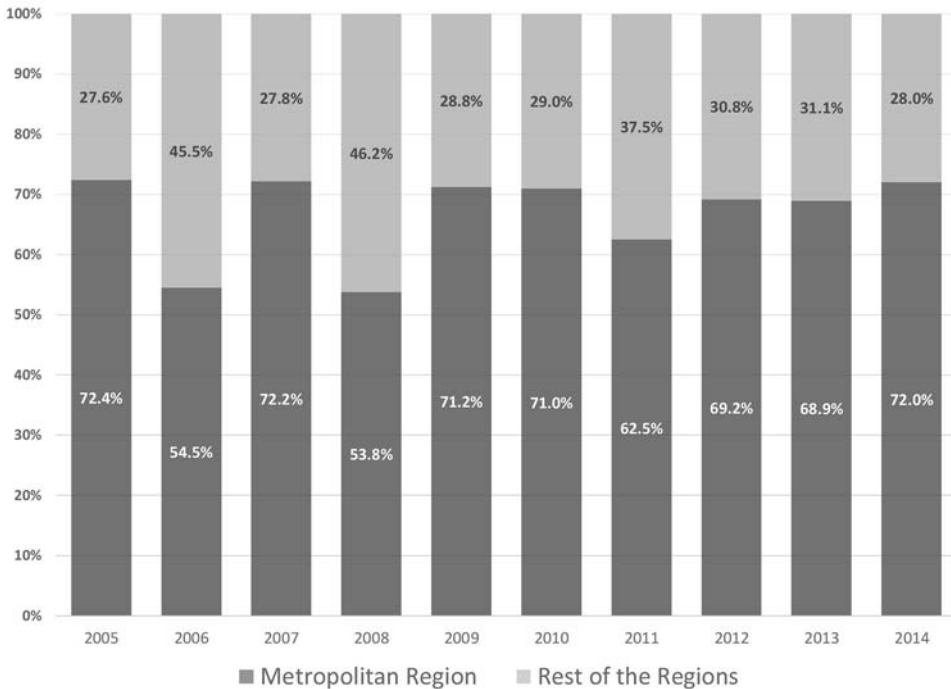
Source: Authors based on SII.

characteristics. The first, the level of ownership of sales on the part of firms that live in Santiago exceeds 75% for every year, and it is relatively constant since 2005. Second, this is a percentage that far exceeds the concentration of the population that lives in the capital and which, additionally, tends to be strongly underestimated by household income surveys. Proximity to political and economic power plays a major role in the extreme concentration of capital in Santiago. Furthermore, due to the centralization of the Chilean state, most decisions, such as access to credit and to public projects, are taken in Santiago and require face to face contacts. From this perspective, concentration of capital has a strong effect on demographic and economic concentration.

Additionally, the strong spatial concentration of capital has another important implication in reference to local taxes that should be paid by the firms in order to function, known as patents or permits for commercial or production activities. While the VAT is collected nationally and goes entirely to finance the nation's fiscal budget, the municipalities or regions where the declaration of the activity was made, are the exclusive beneficiaries of patents and permits paid by the firms. As previously shown, a large majority of these firms pays these taxes in the Metropolitan Region, even though their activity or sales have been carried out in other regions, which favors the municipalities of Greater Santiago over the municipalities where the sales were generated. From this perspective, Santiago enjoys a sort of «fiscal favoritism» against

the interests of the rest of the regions. A dramatic example of this process occurs in the mining sector (see Figure 6), where the Metropolitan Region registers, for many years, more than 70% of the total sales of the sector, while it produces less than 5% of national mining production.

**Figure 6.** Evolution of the Ownership of Sales in the mining activity



Source: Authors base on SII database.

The ownership of the sales also implies ownership of the surpluses or utilities generated by them, which produces an income distribution of capital gains highly concentrated in the Metropolitan Region, in regards to the rest of the country's regions. This process seems to have converged, as the total percentage of capital concentrated in Santiago has been very stable over time, which would be causing an accumulation of increasing inequality in the territory.

### 2.2.2. Higher education system and regional «brain drain»

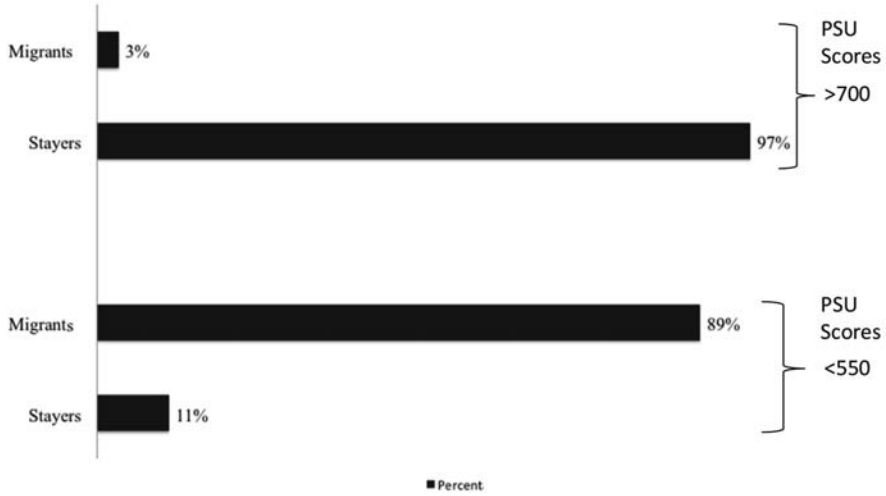
Chacón and Paredes (2015) show that between 1992 and 2011 at least 50% of spatial income inequality was explained by spatial labor sorting, that is the attraction of qualified human capital from the peripheral regions to the Metropolitan Region. This process starts at the moment of deciding where to do the undergraduate studies

and has its roots in the historical concentration of the most prestigious schools and universities of the country in the city of Santiago. Furthermore, current higher education system reinforces the position of the Metropolitan Region because a significant part of the public funds received by the universities depends of the quality of their students.

Chile has a higher education system comprised of state universities, traditional private universities and non-traditional private universities. While the first two categories correspond to the long established Chilean universities, the latter includes universities created principally during the Pinochet's dictatorship. The system of student selection is primarily based on the National Placement Test (PSU) that is unified and in which participate the state universities, the traditional private universities and around 5 of the approximate 50 created during the military government. The students that complete secondary education take this exam, that together with their course grades earned throughout high school, currently 9th-12th grades, comprise their application score for the university and degree program that they wish to study. The application score fluctuates between 450 to 850 points. The students that earn more than 700 have a very high likelihood of being accepted by the universities and programs that they desire, while those that earn less than 550 points have far fewer options.

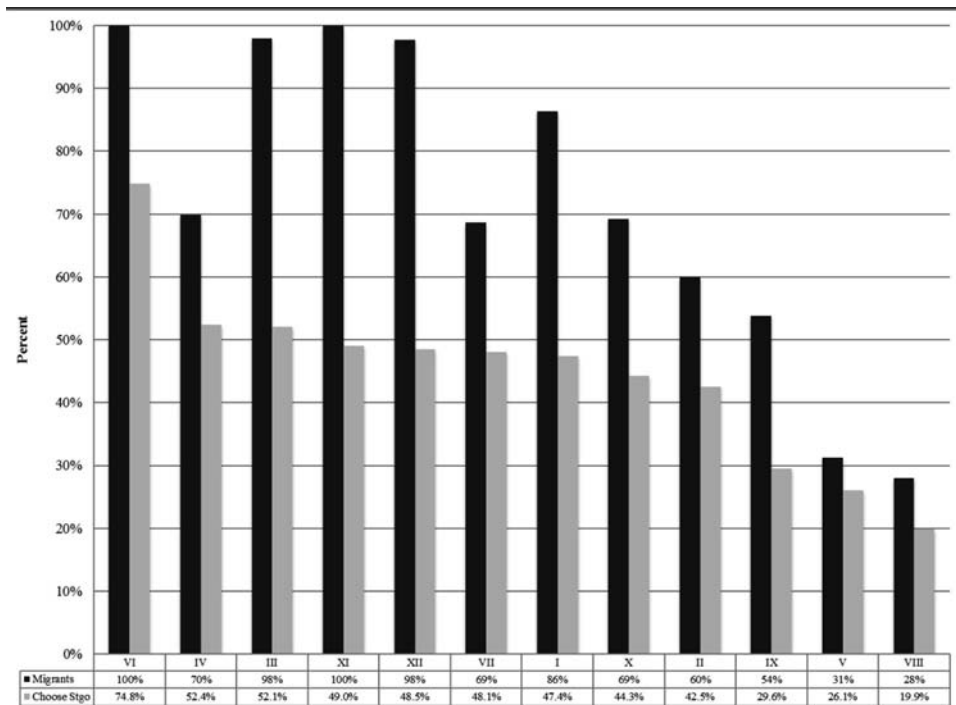
The attraction of students with the highest scores in the PSU by the main universities from Santiago is at the heart of the spatial labor sorting process. In this respect, international evidence (Ishitani, 2011, Kodrzycki, 2001) shows that an important proportion of students find work in the area where their university is located, given that in the education process, especially in professional training, many of the student jobs and internships are developed in the area where the university is located. Consequently, the migration of a student to enter a university can be considered as a movement of potential human capital to this territory. From this perspective, in Chile, there is an intense «brain drain» from the regions to the Metropolitan Region through a process of university selection, creating a replacement of specialized human potential that negatively affects the rest of the territory and that is concentrated in Santiago. Between 2006 and 2008, more than 100.000 students per year entered traditional Chilean universities. In the selection process, 97% of the students from the Metropolitan Region that earned more than 700 points in the PSU stayed in Santiago to study, while more than 50% percent of the students that earned this score from the rest of the regions, migrated to the capital (Figure 7 and 8). Conversely, 87% of students from Santiago that scored less than 550 migrated to study in a regional university and virtually no one from the regions that earned less than 550 left to study in the Metropolitan Region (Figure 7 and 8). It can be said, therefore, that the Metropolitan Region imports good students and exports bad ones. This process, repeated year after year, has created a spatial division of labor among regions (Lufin and Aienza, 2010) and a high concentration of professionals in the Metropolitan Region and reduced the possibilities that the peripheral regions have high quality professionals. An activity where this result is striking is the healthcare. While in Santiago it is possible to find any specialty in different hospitals and private practices, the regions are constantly manifesting frustration about the lack of specialists in different areas of medicine. At

**Figure 7.** Migration Behavior of the Metropolitan Region Students by Scores



Source: Aroca, Eberhard and Pereira (2015).

**Figure 8.** Students Migration Behavior with scores > 700 points from Rest of the Country



Source: Aroca, Eberhard and Pereira (2015).

the same time, as the universities receive more public funds according to the entry scores of their students, the institutional framework of the higher education system itself reinforces the dominant position of the universities from the Metropolitan Region that have the opportunity to invest in better infrastructures and to contract the most qualified scholars.

### **2.2.3. Innovation**

At the end of the 90s and at the beginning of the XXI century, research on total factor productivity (TFP) showed that it had stagnated or even had negative growth for a few years. In 2005, Congress agreed to apply a special tax on the mining industry, whose declared objective was to create a series of efforts to increase the economy's TFP. Since then, incentives were created for firms to spend more in innovative activities, while simultaneously the government created a program to send students to participate in postgraduate programs at first-class foreign universities and many programs to send businessmen to learn about innovative environments abroad. At the same time, a process to accurately measure innovation in the country was started via a national survey that required various attempts before converging on a survey that is reliable and has useful information for the analysis of innovation in Chile.

The sixth through ninth innovation surveys allow for the construction of an annual panel for the years 2007-2014. Using part of the information offered by these surveys, it is possible to construct a regional double-entry table that shows where the firms that decide to spend on innovation are located and in which region this investment takes place. The results show, first, that the vast majority of these expenditures are decided and spent in the Metropolitan Region (region 13). Second and more remarkable, a significant part of the expenditure on innovation that is decided in other regions is carried out in Santiago (Table 1). Furthermore, the distribution of these investments is increasingly growing in the Metropolitan Region over time. These results make it possible to anticipate that the positive results from innovation expenditure will highly concentrate the revenues from innovation in the Metropolitan Region and increase the already high spatial concentration of all of the capital gains. At the same time, the economic geography emerging from this pattern of investment reproduces the core-periphery structure that come from the colonial times, where the core was specialized in more advanced activities and the periphery remained highly specialized in natural resources intensive and extractive activities. In this respect, the lack of industrial policies to develop innovative activities in peripheral regions has been a constant since the return to democracy in Chile. Despite cluster policies were broadly adopted in 2007 by the Bachelet government, these clusters were considered as part of a national competitive strategy becoming, in fact, national industrial policies with scarce territorial content. In any case, the strategy of promoting clusters was completely abandoned four years later during Piñera's government and most investment decisions have been left to the market since then.

In addition, Region of Valparaiso (Region 5), in 2007 used to receive a share from the rest of the country that has a significant reduction in 2014. This region has several good universities and is the second most populated of the country. However, Santiago tend to keep concentrating the main share of the expenditure doing to investment and technology (see Table 1). If this happened with the second most populated and with more universities region of the country, there is not much chance that the rest of the regions do any better.

**Table 1.** Origin and Destination of Innovation Expenditure in Chile: 2007 and 2014

		Destination														
2014	Regions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Origin	1	40%	14%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	42%	0%	0%
	2	0%	10%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	87%	0%	0%
	3	0%	0%	18%	0%	1%	6%	0%	0%	0%	0%	0%	0%	74%	0%	0%
	4	0%	15%	7%	40%	11%	0%	0%	0%	0%	0%	0%	0%	27%	0%	0%
	5	0%	0%	0%	0%	84%	0%	0%	0%	0%	0%	0%	0%	16%	0%	0%
	6	0%	0%	0%	0%	4%	19%	0%	0%	0%	0%	0%	0%	76%	0%	0%
	7	0%	0%	0%	0%	2%	1%	48%	1%	0%	0%	0%	0%	49%	0%	0%
	8	0%	0%	0%	0%	0%	0%	1%	52%	0%	0%	0%	0%	46%	0%	0%
	9	0%	0%	0%	0%	0%	3%	0%	1%	81%	0%	0%	0%	15%	0%	0%
	10	0%	0%	0%	0%	0%	0%	0%	6%	0%	70%	0%	0%	22%	0%	0%
	11	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	41%	0%	55%	0%	0%
	12	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	69%	14%	0%	0%
	13	0%	0%	0%	0%	5%	1%	1%	0%	0%	0%	0%	0%	91%	2%	0%
	14	0%	0%	0%	0%	0%	0%	0%	1%	0%	5%	0%	0%	58%	37%	0%
	15	0%	0%	0%	0%	12%	24%	0%	0%	0%	0%	0%	0%	54%	0%	9%
Origin	1	9%	0%	0%	0%	16%	0%	0%	2%	3%	0%	0%	0%	71%	0%	0%
	2	0%	17%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	82%	0%	0%
	3	0%	1%	36%	0%	6%	0%	0%	0%	0%	0%	0%	0%	57%	0%	0%
	4	0%	0%	0%	16%	2%	1%	1%	0%	0%	0%	0%	0%	81%	0%	0%
	5	0%	0%	0%	0%	58%	0%	0%	0%	1%	0%	0%	0%	41%	0%	0%
	6	0%	0%	0%	0%	8%	59%	2%	0%	0%	0%	0%	0%	32%	0%	0%
	7	0%	0%	0%	0%	2%	1%	64%	1%	0%	0%	0%	0%	33%	0%	0%
	8	0%	0%	0%	0%	3%	0%	0%	29%	1%	0%	0%	0%	67%	0%	0%
	9	0%	0%	0%	0%	12%	1%	0%	0%	68%	0%	0%	0%	18%	0%	0%
	10	0%	0%	0%	0%	4%	0%	0%	0%	2%	65%	0%	0%	29%	0%	0%
	11	0%	0%	0%	0%	24%	0%	0%	0%	0%	12%	5%	0%	59%	0%	0%
	12	0%	0%	0%	0%	11%	2%	0%	0%	0%	3%	0%	45%	38%	0%	0%
	13	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	98%	0%	0%
	14	0%	0%	0%	0%	6%	0%	0%	5%	0%	9%	0%	0%	9%	72%	0%
	15	0%	0%	0%	0%	56%	0%	0%	0%	4%	0%	0%	0%	35%	0%	5%

Source: Aroca and Stough (2016).

#### 2.2.4. The government

Over more than a decade ago, the Chilean Government implemented a purchasing system that is virtual, transparent and by bidding. Every public institution should



post their demands to the site where the providers compete to be selected. The information gathered by the database indicates the region where the firm makes the offer and the region where the public institution makes the purchase.

The Table 2 shows the origin region of the seller in the rows and the destination region of the buyer institution for the years 2007 and 2014. Looking at both matrices, it can be clearly observed that the concentration has been increasing, as every year the Metropolitan Region serves a greater proportion of the regional demands. Additionally, when the purchases are separated according to the size of the businesses, one notes that the large businesses are those that make the difference, since the micro and small businesses in general tend to be local, for which the demands served by these businesses tend to have a similar distribution to the demands of the regions for them, but the large businesses are those that have a high concentration in Santiago.

**Table 2.** Purchases of Regional Institutions (column) from regional businesses (row) 2007

2014		Buyers														
		15	1	2	3	4	5	RM	6	7	8	9	14	10	11	12
Sellers	15	55.6%	0.4%	1.3%	0.0%	0.6%	0.8%	0.7%	0.3%	1.1%	0.2%	0.8%	1.1%	0.1%	7.1%	0.8%
	1	7.0%	11.8%	9.5%	4.5%	1.2%	0.9%	0.9%	1.9%	0.5%	0.4%	0.7%	0.7%	0.7%	0.3%	2.4%
	2	4.7%	1.8%	17.4%	0.0%	0.7%	1.9%	1.2%	1.3%	11.5%	0.6%	0.9%	0.7%	1.0%	0.1%	0.0%
	3	1.3%	0.2%	1.7%	18.7%	27.8%	1.0%	0.8%	1.1%	1.0%	0.1%	3.1%	1.0%	1.1%	2.1%	0.0%
	4	2.3%	60.8%	2.6%	13.2%	13.8%	2.3%	1.5%	1.2%	2.8%	0.5%	0.9%	2.1%	0.3%	0.0%	0.1%
	5	4.5%	1.0%	5.9%	0.0%	1.7%	17.8%	5.5%	2.2%	5.1%	1.7%	6.6%	5.8%	3.7%	0.0%	0.2%
	RM	6.8%	1.6%	28.3%	0.2%	46.2%	50.1%	68.7%	51.5%	35.4%	15.7%	39.2%	33.9%	14.6%	19.0%	1.5%
	6	2.0%	0.2%	2.4%	7.0%	1.4%	2.5%	2.3%	15.4%	5.2%	0.8%	2.0%	1.6%	5.9%	0.1%	0.1%
	7	3.8%	0.2%	4.1%	1.4%	3.4%	4.9%	3.2%	4.2%	15.9%	2.2%	2.8%	10.6%	7.9%	0.8%	0.0%
	8	3.3%	19.8%	13.2%	32.1%	1.2%	9.4%	6.8%	6.7%	11.6%	48.5%	14.2%	21.7%	7.6%	1.8%	0.7%
	9	2.4%	0.3%	5.3%	0.0%	0.2%	3.0%	2.7%	3.7%	3.3%	14.0%	7.0%	12.5%	16.7%	0.2%	
	14	0.3%	0.1%	1.5%	0.6%	0.5%	1.1%	1.2%	0.0%	1.0%	21.6%	6.2%	5.2%	1.0%	0.0%	0.1%
10	2.5%	1.5%	3.0%	9.8%	1.1%	2.6%	2.5%	10.6%	3.4%	2.7%	7.4%	6.8%	42.2%	10.5%	0.6%	
11	1.4%	0.0%	2.4%	11.4%	0.0%	0.7%	0.7%	0.1%	0.2%	1.2%	0.7%	0.7%	40.6%	0.2%		
12	2.0%	0.4%	1.4%	1.1%	0.3%	0.9%	1.7%	0.7%	1.6%	0.5%	0.5%	1.1%	0.8%	0.9%	93.0%	
2007		Buyers														
		15	1	2	3	4	5	RM	6	7	8	9	14	10	11	12
Sellers	15	28.0%	11.6%	0.6%	0.0%	0.1%	0.6%	0.4%	0.2%	1.0%	0.2%	1.1%	0.5%	0.1%	0.0%	0.0%
	1	17.1%	44.2%	9.3%	8.0%	0.0%	0.8%	0.5%	0.1%	0.7%	0.0%	1.1%	0.3%	0.0%	0.0%	1.0%
	2	29.1%	16.7%	66.8%	0.6%	1.3%	3.4%	2.1%	2.1%	0.7%	0.1%	1.4%	0.7%	0.9%	0.2%	0.0%
	3	0.4%	2.9%	0.4%	40.3%	2.8%	0.7%	0.7%	1.7%	1.2%	0.1%	1.9%	0.8%	0.3%	0.0%	0.0%
	4	2.0%	0.0%	1.0%	3.1%	46.9%	1.8%	1.3%	1.2%	2.7%	0.1%	1.4%	1.2%	0.6%	0.0%	0.0%
	5	4.9%	2.7%	1.0%	0.1%	2.8%	31.8%	3.4%	0.9%	3.1%	0.7%	3.8%	3.1%	1.0%	0.0%	0.2%
	RM	9.5%	9.4%	13.6%	8.7%	41.3%	45.2%	76.9%	33.6%	49.4%	57.4%	52.5%	54.3%	63.9%	4.6%	2.4%
	6	0.7%	5.9%	0.5%	0.5%	0.3%	1.6%	2.0%	29.6%	3.8%	0.1%	2.8%	2.4%	0.4%	0.4%	0.0%
	7	1.9%	2.0%	2.4%	4.2%	0.6%	3.5%	1.9%	2.0%	25.2%	0.5%	7.1%	4.7%	0.4%	0.3%	0.0%
	8	2.1%	0.9%	0.7%	0.5%	1.9%	3.9%	5.2%	25.8%	4.4%	8.9%	7.7%	5.7%	1.3%	0.7%	0.1%
	9	1.7%	1.3%	0.7%	0.4%	0.9%	2.7%	2.7%	1.1%	2.4%	1.8%	12.7%	12.2%	1.1%	0.5%	0.3%
	14	0.5%	0.6%	0.1%	0.0%	0.4%	1.1%	0.5%	0.0%	1.2%	0.3%	2.0%	8.8%	1.2%	0.6%	0.0%
10	0.9%	0.3%	0.9%	22.6%	0.4%	2.2%	1.6%	1.4%	3.0%	29.6%	2.7%	4.8%	27.3%	19.6%	0.3%	
11	0.3%	0.0%	0.5%	3.9%	0.0%	0.1%	0.2%	0.1%	0.0%	0.2%	1.0%	0.1%	1.0%	67.3%	0.4%	
12	0.9%	1.3%	1.4%	7.0%	0.1%	0.8%	0.6%	0.1%	1.0%	0.2%	0.8%	0.5%	0.4%	5.7%	95.2%	

Source: Aroca and Contreras (2016).

This is another example of the spatial blind policy of the Chilean government. In general, when the regions compete for getting a share of the market, the ones that will win that competition will be the most developed, increasing the inequalities with those less developed regions. It means, if for more than two hundred years, sys-

tematically concentration have been growing around the Metropolitan Region (RM), there is no way that the lagged regions catch up the developed ones, in a competitive framework. The government will have to design some affirmative action or positive discrimination focus on the lagged regions in order to improve the access to opportunities and promote a more balanced territorial development.

## Conclusions

When the institutional framework is biased to promote the concentration of people and economic activity in one city, normally the capital, it is plausible to expect that the excess of agglomeration will constraint economic growth reducing, at the same time, potential opportunities in the peripheral cities. This seems to be case in many Latin American countries, and particularly in Chile. Furthermore, one of the characteristics of Latin American institutional frameworks have been historically the existence of favoritism in support of the main cities and the predominance of spatially blind policies that are only apparently neutral and, in many cases, are perpetuating spatial inequalities. In this sense, it is not clear whether traditional models based on the experience of developed countries are appropriate for the Latin American experience. The Chilean case shows how historical patterns of location and an extremely centralist institutional framework maintain primacy indexes among the highest in the world despite economic development.

One of the main lines of research where regional and urban economics should deepen in Latin America is the relationship between concentration and growth and particularly the processes of agglomeration without growth that seem to characterize not only this continent but also African countries. In this respect, it is necessary to analyze and measure the negative effects and congestion externalities in large agglomerations, an aspect where both theoretical and empirical studies are scarce both in Latin America and other regions. Research is also scarce on the explanation of the process of dispersion of population, activity and investment from the main cities to the peripheral regions. What are the forces that lead this process? Which regions will be benefited from this process? To what extent and what kind of public policies are able to rebalance the spatial economy of Latin American countries? Are models developed for Europe and United States, based on shorter distances and highly developed transport infrastructure valid to explain the evolution of Latin American urban systems? In this respect, an institutional approach that takes into account the origins and evolution of regional inequality can be very useful to understand some of the causes that underlie the processes of persistent spatial concentration in Latin America, processes that in many cases are not governed by the logic of market forces. Rebalancing the spatial economy of a country in favor of peripheral regions often implies a territorial redistribution of power and conflicts. This opens another line of development for regional and urban economics research in terms of the need for a more pluralistic approach open to multidisciplinary research taking into account the contributions of the whole set of social sciences.

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