

RECENT DYNAMICS OF THE CHILEAN URBAN SYSTEM 1970-2002: INTEGRATION AT A NATIONAL LEVEL

Severino Escolano Utrilla

Departamento de Geografía y Ordenación del Territorio. Universidad de Zaragoza
severino@unizar.es

I. INTRODUCTION

In the past four decades, the social, economic and territorial structures of Latin American cities have undergone major transformations.

The socio-economic, spatial, urban and morphological changes have been the subject large amount of research from various perspectives and disciplines. In the case of Santiago de Chile and other Latin American cities, the studies have demonstrated the influence of globalisation and economic liberalisation as driving forces and models for these changes.

However, other longterm structural abnormalities of the longest cycle alterations found in urban systems have hardly been investigated despite their importance for cities and citizens.

The aim of the current paper is to analyse, model and interpret recent changes in the structure of the Chilean urban system from the dynamics of the cities that comprise it. These changes are examined in the context of the strong connection between the Chilean economy and the world economy as well as the current process of metropolitan expansion and improvement of territorial cohesion.

II. CONTEXT AND FRAMEWORK

The recent urban and socio-economic transformations are part of the process of incorporating the Chilean economy and society into the world system.

The neoliberal policies implemented by successive Chilean governments since the mid-1970s have set a specific socio-economic model, which is characterised by a high degree of economic liberalisation. Consequently, the integration of the Chilean economy into the world economic system has been quite successful, as evidenced by the high volume of exports and strong foreign capital investment.

The intense effects of these policies have resulted in sharply increasing growth rates of gross domestic product, which have been accompanied by significant social, economic and territorial changes. Other changes include the shift of the economy and *lifestyle* toward services; improvements in infrastructure, networks, transportation services (land, sea and air) and communications; the morphological and functional metamorphosis of big cities; and changes in the structure of the urban system.

Approaches to studying cities as urban systems are based on the concept of cities as a set of centres that interact through various mechanisms to develop multiple socio-economic functions in a given territory.

The descriptors of the cities' distribution according to their size are among the significant parameters that define the system structure. The study of urban system dynamics and properties, particularly the regularities of their structure, has been approached from various disciplines. The results of this nearly century-old academic tradition have made significant progress in the interpretation, analysis methods and research tools.

The regularity and the spatial and temporal persistence of the relationship rank-size have been explained using macroeconomic equilibrium assumptions, from stochastic growth processes and, more recently, as an inherent result of complex adaptive systems. This approach is followed in the present study.

These findings demonstrate that the functioning of urban systems responds to certain general principles, proper to complex organisations, self-similar, whose main magnitudes are scaled by nonlinear functions. However, macro scale order and regularity emerge from the strong mobility of the surveyed cities, which requires more research.

III. METHODS AND DATA

The basic data used in this study correspond to total populations of cities in the last four censuses: 1970, 1982, 1992 and 2002. The preliminary step was to establish an operational definition of «city». This consideration included all «*districts*» (census spatial entity) of a municipality that was designated as «*urban*» in the census, resulting in 5,000 additional inhabitants in 2002. The work sample is composed of 186 cities with comparable information.

Absolute population was chosen as the indicator of urban trajectory for the following two reasons: 1. the availability of complete, consistent and comparable series and 2. its ability to represent the urban reality. The use of this indicator also rests on a strong correlation between the total population and the socio-economic functions of the cities. In turn, the socio-economic and dynamic potential of each city is well synthesised by these reasons.

The potential model is considered as the best suited to fit the distributions for each census data set: exponent variations estimate the structural trends of the urban system. We finally validated the fit of this function if the coefficient of determination $R^2 \geq 0.97$. City distributions excluding Santiago were also analysed. As the national capital and first city of the system, Santiago was excluded due to its function in coordinating the national urban system with other national and supranational institutions.

Micro-scale changes for each city have been estimated by the magnitude *distance-range* and other measures derived from it.

IV. RESULTS AND DISCUSSION: SLOW INTEGRATION AT THE NATIONAL LEVEL, NOTABLE MOBILITY AT THE MICROSCALE

The analysis of the most important parameters that characterise the urban system's global evolution suggests that it tends, in a clear and continuous manner, towards overall integration and increasing complexity.

The exponent of the potential model that fits the urban distribution tends towards unity, as theoretical studies have advocated. However, empirical data do not allow automatic association between the urban system dynamics and a specific status or socio-economic level.

The shape of the distribution curve for rank-size also reflects the consistent integration process of the urban system. Indeed, the 1970 profile shows ruptures in the subsystems that were not fully integrated and that weakened or disappeared over time. The development of road networks, airports and communications has led to system cohesion at the following two levels: the national scale, when facilitating the connection of large cities, in particular the regional capitals and the local scale, strengthening the metropolitan fabric around large cities.

The parsimonious changing of the aggregate structure of the urban system is compatible with intense local turbulence at the micro scale.

In fact, the average variations of the ranges were strong and had pronounced differences depending on the size of the cities. In the first group (cities over 20,000 inhabitants), the cities were less likely to change in range (they were less numerous), and the average distance-range did not exceed 4.1 in any census year. However, this measure varied between 7.5 and 12.1 in the other cities (from 5,000 to 20,000 inhabitants). On the other hand, the dynamics of urban ranges, estimated by measuring the distance R_{Havlin} , show the structural persistence and continuity of the urban system. In other words, none of the surveys considered (between 1952 and 2002) evidenced returns to previous situations; the strongest range changes were found in the last intercensus survey for 1992-2002 and in the decade of the 1970s.

The permanence of Great Santiago at the head of the system is due to its great economic and demographic weight, which is well known. The early stages of socio-economic restructuring that began in the mid-1970s produced, among other effects, the territorial dispersal of economic activities and the consequent lessening of the primacy of the capital. However, since the mid-1980s, the configuration of Santiago as a node in the global network of cities and the changes in its economic base has allowed it to recover and again consolidate its great economic power.

Large and intermediate cities have asserted their economic importance through their connection to domestic markets and the global economy. It appears as though the intensity of competition between cities, and its results, has heavily depended on the «internationalisation» of their economies since at least 1982.

In fact, the majority of the cities that moved through their ranges, or remained where they were, were those in which investments are localised in production activities that are oriented to international markets, including Calama, Copiapó, La Serena-Coquimbo, Puerto Montt and Castro. Another group of «winner» cities, such as Colina and Buin, is characterized by its recent integration into large metropolitan areas as a result of the *expanded metropolisation* or

regional-based urbanisation process. Cities that specialised in tourism also moved forward in ranges, but only if they were in the areas of influence of large cities such as Puerto Varas and Concón; this does not apply to isolated cities (Villarica).

At the other extreme were cities that drew back in ranges because their population decreased or their growth was slower than that in other cities. Generally, these were cities with market centres and strong associations with agricultural activities. Such cities have had and still have a significant role in organising the territory as trade and service centres that help set the population. Currently, rural depopulation and the transportation improvements have caused this stage of urban network services to be transferred to the superior or large cities.

The scope and meaning of changes in the urban system should be valued in the general context of urban population dynamics, which is characterised by the population concentration in large cities and the stabilisation and convergence of growth rates, which is increasingly less dependent on the size of the nuclei. The spatial pattern of population growth is characterised by the sharp contrast between the central-meridian area of the country and the spaces to the north and south. Nationally, the spatial concentration of growth is diminishing as the population of large regional cities increases. At the regional scale, it seems as though the concentration of growth is pronounced, especially in the north and south of the country. In the centre (the Metropolitan Region, the region of Valparaíso, O'Higgins, Maule and Bio-Bio), the urban network is more complex, and decentralisation processes move from large cities to nearby smaller cities, which receive migrants from the large urban centres.

V. CONCLUSIONS

The structure of the urban system in Chile has changed over the past thirty-five years as an adaptive and innovative response to the effects of the liberalisation measures of the socio-economic framework of the system (the inter-city relocation of the population, improvement of transportation, new models of metropolitan urbanisation and diversification of the urban economic functions).

The evolutionary direction of urban systems points to greater functional and spatial integration, as reflected by the main parameters that define the organisation and structure of the system. This phenomenon is evidenced, for example, in the lessening, albeit slow, primacy of the urban system and the consolidation of the demographic weight of large cities. This also increases their functional diversity, or the softening of the jumps among urban categories, which is a reflection of the growing continuity of the structure of the urban system. Taken together, these and other features can be interpreted as signs of the increasing maturity and complexity of the Chilean urban system.

The trends described are particularly strong in the centre-south of the country, where a dense urban network has been consolidated and organised in multiple levels. In contrast, in the north and south of the country, the urban networks are more simple and lax, such that they could be described as «urban deserts».

The strengthening urban system integration is the result of a remarkable mobility of cities (system elements). If the apex of the system is held by the Greater Santiago and large cities are well established in the immediate stage, it is also true that the territorial reorganisation

of productive activities (induced mainly by economic globalisation) has favoured medium-sized cities strengthened by the economic growth achieved on the basis of high international demand resources. The expansion and decentralisation of the large urban centres toward neighbouring cities, more or less distant from their centres, have also been driving factors of the urban dynamics in recent decades.

