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FUNDACIÓN DE LAS CAJAS DE AHORROS
DOCUMENTO DE TRABAJO
Nº 310/2007

De conformidad con la base quinta de la convocatoria del Programa de Estímulo a la Investigación, este trabajo ha sido sometido a evaluación externa anónima de especialistas cualificados a fin de contrastar su nivel técnico.

ISBN: 84-89116-07-5

La serie **DOCUMENTOS DE TRABAJO** incluye avances y resultados de investigaciones dentro de los programas de la Fundación de las Cajas de Ahorros.

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LONG-RUN REGIONAL POPULATION DIVERGENCE AND MODERN ECONOMIC GROWTH IN EUROPE: A CASE STUDY OF SPAIN*

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Abstract

The objective of the present study is to analyze the disparities in long-run regional population growth in continental Europe. To this end, we propose a convergence equation for regional population distribution for eight Western European countries in the period 1850-2000. Our results show that divergence in economic growth at regional level has been a common pattern in Europe. We choose the case of Spain in order to depict the characteristics of this process or regional demographic divergence, studying the spatial dynamic of the Spanish population, focusing firstly on the processes of concentration-dispersion on a general scale. Finally, we establish a regional typology of long-term Spanish population growth, based on cluster analysis

Resumen

Nuestro objetivo en este trabajo es analizar las disparidades en el crecimiento demográfico regional en el continente europeo en el largo plazo. Para ello se plantea una ecuación de convergencia de la distribución regional de la población para ocho países de Europa Occidental en el periodo 1850-2000. Nuestros resultados muestran que la divergencia en el crecimiento demográfico a escala regional ha sido una pauta común en Europa. Hemos elegido a continuación el caso de España para mostrar las características de este proceso de divergencia demográfica regional, estudiando la dinámica espacial de la población española, centrándonos primero en los procesos de concentración/dispersión a escala general. Por último, hemos establecido una tipología regional del crecimiento demográfico español en el largo plazo basándonos en un análisis cluster.

JEL classifications: J11, N30, O18, R23

* We gratefully acknowledge the assistance provided by Isabel Sanz and Javier Silvestre. The present study has received financial support from the Spanish Ministry of Education and Science, project BEC 2003-01757 (M.I. Ayuda) and the Department of Science, Technology and Universities of the Aragonese Government, consolidated research group of Historia de la Economía Agroalimentaria (F. Collantes and V. Pinilla).

1. Introduction

In the last two centuries the economies of the various European countries have undergone radical changes. The process of industrialization, initiated in Great Britain at the end of the XVIII century and extended throughout the XIX century to most of continental Europe, was the driving force behind such transformations. Several decades have passed since Simon Kuznets coined the term "modern economic growth", the principal characteristics of which were the rapid increase in per capita income, structural change and population growth.

From a spatial perspective, research into the long-term evolution of the European economy has focused on studying the differences in the rhythm and characteristics of industrialization processes, both national and regional. Regional disparities in terms of economic growth have also been an important subject, with especial importance placed upon the polarization that has occurred in Europe and has produced serious disequilibria among its constituent countries, which on occasion have been comparable in intensity to those existing at international level. Such research has been able, for a considerable time, to utilize a general explanation of the evolution of regional economic imbalances, based on the formulation of the hypothesis proposed by Williamson (1965), who indicated the existence of an inverted U-pattern in regional disparities in the course of the development process.

However, there has been little research into disparities in demographic growth from a regional perspective. Instead, research has been concentrated upon the study of the principal reasons for such disequilibria i.e. internal and external migratory movements and their determinants, while their impact at regional level has attracted less interest. Regional and urban economics have focused on explaining how some cities have grown to become huge metropolitan areas, while the regional approach employed here, by contrast, analyses why certain regions have tended to attract population from other areas; we believe this subject has not yet received the attention it deserves (Fujita, Krugman and Venables, 1999; Henderson, Shalizi and Venables, 2001; Fujita and Tisse, 2002; Duranton and Puga, 2004; Rosenthal and Strange, 2004).

However, the reality of today's Europe displays enormous differences in regional population density within its constituent countries (Mouqué, 2004). Such divergence is, furthermore, considerably more important than that existing in pre-industrial Europe, thereby demonstrating that unequal economic development has had significant demographic consequences. In many European regions the current population is, in absolute terms, lower that that of 1850, which may even lead us to

question whether they have experienced full economic growth, as defined by the classical Kuznetsian conception[1].

Our objective in the present study is precisely to analyze disparities in long-run regional demographic growth and their characteristics. We shall commence by showing that divergence in regional population growth has been the general rule in Europe, and thus we shall estimate convergence equations for eight different countries. We then subsequently employ the Spanish case to illustrate the characteristics of this process of regional demographic divergence, firstly by studying the spatial dynamic of the Spanish population, concentrating on the processes of concentration-dispersion at a general level. Secondly, we shall attempt to establish a regional typology of Spanish demographic growth in the long-run, performing a cluster analysis. Finally, we will present our conclusions.

2. Regional population divergence in Europe

2.1. Data description

This paper is basically intended to analyze why population is not evenly dispersed throughout countries, but instead tends to become concentrated in certain areas. The main objective of this section is to measure the extent to which population growth at the regional level has either converged or diverged in different European countries between the middle of the XIX century and the end of the XX century.

Our research interest is not the analysis of urbanization and the dynamics of major cities; instead, we concentrate on the processes of population concentration-dispersion at a somewhat higher level of aggregation, which implies amplifying our focus to examine broader administrative units, including not only major cities but also medium-sized and small towns, as well as rural populations. This option means that population density in the units selected for analysis is not affected by the counter-urbanization processes that have increasingly developed in recent decades, with the surge in commuter towns around the great metropolitan areas and the relocation of the urban populace to the suburbs[2]. These processes therefore need to be seen as movements, within a given territory, which do not change regional population location patterns, although they affect the configuration of metropolitan areas. Moreover, the

[1] 80 European regions (NUTS-3) in France, the United Kingdom, Portugal, Italy and Spain today have a population lower than in the mid-XIX. In Sweden, the Netherlands/Holland and Belgium no region is currently in the same situation.

[2] This choice is consistent with Ciccone and Hall's (1996) approach to the study of spatial differences of productivity in the United States..

analysis of a larger unit allows us to cover the entire territory of a country rather than merely cities or metropolitan areas, thereby avoiding the problem of selectivity bias[3].

Accordingly, we have chosen to examine administrative units which are bigger than cities but smaller than large regions i.e. sufficiently large to avoid the above-mentioned problems of short-distance population movements, but not so sizeable as to include areas with totally different demographic dynamics. Inevitably, many of these units group together important cities with their surroundings, which on many occasions were rural until only a few decades ago.

Table 1 provides summary statistics regarding regional population density in the countries selected. In several key aspects, their evolution is similar. Thus, in all of them the standard deviation of initial population density (around 1850) with respect to the country average was high, which seems logical given the highly diverse natural conditions which may have existed, especially within large countries, and which strongly conditioned economic activity. Nevertheless, from that time onwards there seems to exist a common pattern, in the sense that strong population growth in Western Europe, due to the demographic transition coincided with a increasing divergence of regional population densities, as shown by the marked rise in the coefficients of variation in all countries. A logical consequence of this growing disparity was the similarly common trend, evidenced by the Gini indices, towards an increasing concentration of the population in certain regions.

[3] Other studies also reveal a preference for the analysis of population using larger administrative units than the city or metropolitan area. See Beeson et al. (2001), Davis and Weinstein (2002) and Rappaport and Sachs (2003).

TABLE 1. SUMMARY STATISTICS OF EUROPEAN REGIONAL POPULATION DENSITIES, CIRCA 1850-2000

	Population density (habitants per square kilometer)								
	mean		s.d.		c.v.		Gini coefficients		number of
	1850	2000	1850	2000	1850	2000	1850	2000	admin. units
Belgium	152	359	70	194	0.46	0.54	0.303	0.359	9
France	70	112	48	180	0.68	1.60	0.243	0.463	88
Italy	110	233	93	317	0.84	1.36	0.226	0.398	95
Portugal	77	146	40	171	0.52	1.17	0.331	0.562	19
Spain	31	79	22	146	0.71	1.87	0.266	0.522	48
Sweden	19	44	14	52	0.74	1.16	0.451	0.531	24
Switzerland	83	281	55	322	0.66	1.14	0.311	0.410	24
United Kingdom	113	290	303	920	2.67	3.17	0.508	0.635	87

s.d.= standard deviation
c.v.= coefficient of variation
Source: see Appendix 2.

2.2. Regression analysis of European regional population divergence

In order to study more precisely the degree of divergence which has taken place in the long-run in Western European regional population, we shall perform a regression analysis which permits us to accurately estimate such divergence and the rhythm at which it occurred. We use the nonlinear least squares estimations employed by Barro and Sala-i-Martin (1992), following Beeson *et al.* (2001):

$$(1/T)\log(p_{iT}/p_{i0}) = \alpha + [(1-e^{\beta T})/T]\log(p_{i0}) + \theta\log(l_i) + \varepsilon_i \qquad (1)$$

where l_i is the land area (measured in km^2) of region i, p_{it} is the population in region i in year t, (T corresponds to the last year of the period and 0 to the initial year of the period analyzed) and ε_i is a random error term.

This is the conventional method of estimating rates of convergence-divergence, where a negative value of β represents the annual rate of convergence of the population to a common steady-state value. We call such convergence-divergence unconditional, because we do not take other types of variables into account.

In order to perform this estimation we have used as initial data those which correspond to each region in the population census closest to 1850 which is available. Our final data are those closest to the year 2000 which are available (see Appendix 2).

Subsequently, we first estimate the model using the initial population as the explanatory variable. Secondly, we repeat the estimation, but this time with the

inclusion of land area as an explanatory variable, which allows us to demonstrate the robustness of our results with regard to the use of population densities. Unconditional convergence-divergence rates are calculated for all the countries studied. In both cases, our results provide strong evidence of divergence for all countries, given that the estimation of β is positive. The rates of regional population divergence range in almost all cases between 3.3% and 4.2% annually; the only striking difference concerns the speed of the divergence process in France (9.5% per year).

Table 2: Unconditional regional population convergence-divergence rates in some European countries, circa 1850-2000

COUNTRIES	UNCONDITIONAL CONVERGENCE-DIVERGENCE		
FRANCE	**Coeff.**	**S.E.**	**p**
Log population 1861	0.095	0.00007	0.0
Log land area	-0.014	0.0058	0.015
R^2	0.18		
NETHERLANDS	**Coeff.**	**S.E.**	**p**
Log population 1859	0.040	0.00001	0.0
Log land area	-0.0049	0.0025	0.088
R^2	0.35		
SWITZERLAND	**Coeff.**	**S.E.**	**p**
Log population 1850	0.033	0.000004	0.0
Log land area	-0.0007	0.0008	0.3888
R^2	0.06		
SWEDEN	**Coeff.**	**S.E.**	**p**
Log population 1860	0.037	0.00001	0.0
Log land area	0.0010	0.0008	0.2635
R^2	0.07		
PORTUGAL	**Coeff.**	**S.E.**	**p**
Log population 1878	0.042	0.00002	0.0
Log land area	-0.0006	0.00015	0.6882
R^2	0.29		
ITALY	**Coeff.**	**S.E.**	**p**
Log population 1871	0.040	.000005	0.0
Log land area	-0.00004	0.0008	0.95
R^2	0.008		
UNITED KINGDOM	**Coeff.**	**S.E.**	**p**
Log population 1851	0.042	0.000004	0.0
Log land area	-0.0039	0.0007	0.0
R^2	0.52		
SPAIN	**Coeff.**	**S.E.**	**p**
Log population 1860	0.035	0.00001	0.0
Log land area	-0.006	0.001	0.0
R^2	0.35		

Sources: see Appendix 2.

To confirm the robustness of our results, we repeated the exercise for three large countries (Spain, Italy and France), excluding for each country the 10% most densely populated regions; in terms of divergence, the results are identical.

If regional population densities have displayed similar trends in Europe, it would appear reasonable to assume that a common cause may explain such similar behavior in all the cases analyzed. From our perspective, regional differences in the spread of industrialization and economic growth in general produced various opportunities for employment and earnings at regional level; these in turn generated significant migratory processes, generally from rural to urban zones and from poorer to richer regions. Essentially, this provides the explanation for current European population distribution (Boyer, 1997; Grant, 2000; Greenwood, 1997; Silvestre, 2005).

These migratory movements may also have affected the demographics of certain regions, particularly through the reduction/increase of women and young cohorts. Consequently, the low/high natural demographic growth may also have reinforced regional population disparities.

Industrialization resulted then in an intensification of demographic differences. In most countries, however, industrialization did not profoundly affect the pattern of population distribution inherited from the pre-industrial era - it just tended to reinforce regional differences within that broad pattern (Ayuda, Collantes and Pinilla, 2005).

At the regional level, something similar to the system of pre-industrial cities occurred; that is to say, the XIX and XX centuries produced no fundamental changes, but instead tended to accentuate the differences previously existing between cities (De Vries, 1984; Hohenberg, 2004).

In the case of regional population distribution, locational fundamentals decisively influenced European population distribution during the pre-industrial period, when natural factors largely determined the spatial location of populations. Following the onset of industrialization and, above all, the increasing importance of economic activities in which the existence of increasing returns was significant, as in modern industry, both economic activity and population tended to be located in those zones whose previous position was already important (Krugman, 1991**)**. Clearly, some regions with diverse comparative advantages, such as the availability of key natural resources for industrialization (e.g. coal) were also able to expand upon such bases[4]. Research into the regional distribution of the Spanish population between 1787 and 2000 has emphasized the importance of the existence of increasing returns in the

[4] A discussion of the importance of increasing returns or the comparative advantages in European industrialization may be seen in Crafts and Mulatu (2005) for the case of England or Rosés, (2003) and Tirado, Paluzie and Pons (2002) for Spain.

process of regional-level spatial population divergence (Ayuda, Collantes and Pinilla, 2005).

We can conclude that since 1850 regional population in Europe has generally diverged. The most important aspect of this experience has been the reinforcement of the demographic disparities which existed in Europe prior to the processes of industrialization and modern economic growth.

To analyze the spatial dynamics of European population evolution at regional level in the last two centuries we have chosen the case of Spain; not only is it sufficiently large but, as Table 2 shows, the process of spatial demographic divergence fits very well into the general European pattern. We shall develop this analysis from two perspectives; firstly we study importance of the population concentration-dispersion processes and, secondly, the typology of the various regions which participated in these processes.

3. Population, economy and territory in Spain: a long-run perspective

Spanish economic historians are in reasonable agreement that the industrialization and modern economic growth of the country began in the mid-XIX century (Pascual and Sudrià 2002; Prados de la Escosura 2003; Nadal (ed.) 2003; Carreras and Tafunell 2004). Fortunately, population data for the various provinces are not only available for the entire period from then until today, but also for 1787. It should be made clear that Spanish provinces result from the application of formal administrative criteria at a lower level of aggregation than that of functional or historical regions. Therefore, our study of provincial trends will imply using the term “regional” in a weak sense throughout the text. However, this choice will allow for a more accurate study of the spatial dynamics of population[5].

We should consider three lengthy phases: 1787-1860, 1860-1950 and 1950-2000. Each phase corresponds to a different type of economy and, in turn, each of these types of economy corresponds to different population dynamics.

Between 1787 and 1860, the Spanish economy was basically a pre-modern economy in the Kuznetsian sense: the rate of growth of GDP per capita was presumably very low and the structural changes detected by Kuznets had not yet begun on a national scale, but only in Catalonia, a pioneering region of

[5] On the evolution of the Spanish population see Reher (2004) and Delgado (2004). Approaches to the spatial dynamics of the Spanish population can be found in Goerlich and Mas (2006) and Cos and Reques (2005).

industrialization. This is not to say, however, that the Spanish economy had not participated in the general spread of markets registered in early modern Europe (Ringrose 1996). By the start of industrialization, therefore, the institutional framework of the economy was not yet capitalist, although the role of markets in the allocation of resources and the definition of comparative advantages was by no means negligible.

Between 1860 and 1950, the Spanish economy underwent an initial phase of slow industrialization, in which not only did GDP per capita increase (although more slowly than the rates prevalent in northwestern Europe) but also the majority of Kuznetsian structural transformations began. Thus, for example, by approximately 1950, the share of agricultural employment had fallen from the 75% typical of preindustrial societies to approximately 50%. Halfway between the traditional economy and the modern economy, Spain could be considered as an economy on the path to industrialization.

Finally, between 1950 and 2000, Spain underwent the culmination of its modern growth: the rate of increase of GDP per capita accelerated (in particular, until the crisis of the mid-1970s) and, by approximately the 1980s, some of the Kuznetsian structural changes had been completed and, albeit somewhat timidly, dynamics were emerging to point the route towards a post-industrial type society (Bell 1974). For example, it was during the 1980s when the rural exodus, which had reached considerable proportions in the previous decades of the "Spanish economic miracle", clearly began to decelerate and some of the city-country migratory routes were in fact consolidated (Camarero 1993). By the end of the XX century, therefore, the rates of urbanization, the sectorial structure of employment, the composition of foreign trade and, more generally, the structure of aggregate demand (Prados de la Escosura 2003) signaled that Spain had become a fully modern economy.

Using three types of index (Gini, Theil and Herfindahl), Table 3 shows the dynamics of spatial population concentration in these three types of economy. In all cases such concentration tended to increase, although magnitudinal differences were significant. Thus, in the late preindustrial economy of 1787-1860, the growth in concentration was very small; in fact, it is only perceptible in two of the three indices. Subsequently, during the phase of slow industrialization (1860-1950), the rhythm of concentration accelerated. Finally, the phase of rapid modern growth (1950-2000) coincided with an unprecedented increase in the spatial concentration of the Spanish population. Thus, although the different indices suggest different dates for the historical peak of concentration, it seems clear that this occurred at some point between 1981 and the present day. As Graph 1 shows, this has produced a long-run concentration curve which bears little relation to an inverted-U: the final stages of the Kuznetsian

process of economic change, far from registering a reduction in concentration, witnessed an unprecedented acceleration.

The immediate determinant of this change in population concentration was migration, which exerted a redistributive function much more direct and intense than that played by the differences which, at specific points in time, have existed between the natural rates of growth of the different Spanish provinces[6]. Various studies have shown that the geography of migrations in Spain has historically been highly sensitive to the distance between places of origin and places of destination, probably due to the restrictions imposed by the costs of the journey and the remaining costs and elements of uncertainty which vary according to distance (Silvestre 2001 and 2005). Thus, internal interprovincial migrations were low not only in the late preindustrial economy in the period 1787-1860 (in which the reduced rate of economic growth was unable to generate large migratory flows), but also in the (slowly expanding) modern economy in the period 1860-1950.

Table 3. Concentration and dispersion indices, and temporal correlation of the population of Spanish provinces, 1787-2000

Year	Gini coefficient	Theil index	Herfindahl index	Spearman correlation with 1860	Raw correlation with 1860	Share of five largest provinces	Relative variance of log population density
1787	0.255	0.039	0.028	0.881	0.961	18.2	0.933
1860	0.266	0.040	0.028	1.000	1.000	19.0	1.000
1877	0.279	0.043	0.028	0.995	0.994	20.1	1.067
1887	0.279	0.045	0.029	0.979	0.981	20.4	1.067
1900	0.289	0.051	0.030	0.967	0.951	21.5	1.090
1910	0.292	0.053	0.031	0.954	0.938	21.9	1.191
1920	0.310	0.060	0.033	0.949	0.914	23.0	1.216

[6] On internal migrations in Spain, see Recaño (2004) and Silvestre (2005).

1930	0.333	0.071	0.036	0.936	0.876	25.3	1.341
1940	0.346	0.073	0.036	0.924	0.880	26.2	1.477
1950	0.358	0.081	0.038	0.922	0.858	27.8	1.592
1960	0.402	0.103	0.045	0.920	0.810	31.0	1.700
1970	0.477	0.141	0.056	0.926	0.772	36.3	2.065
1981	0.508	0.156	0.060	0.920	0.765	38.9	2.842
1991	0.520	0.155	0.059	0.912	0.764	39.4	3.381
2000	0.522	0.155	0.058	0.916	0.765	39.8	3.527

Source: Collantes and Pinilla (2003).

In this latter period (1860-1950) the beginnings of modern economic growth generated a limited number of focal points which attracted migrants, basically in the regions heading Spanish industrialization, such as the northern regions of Catalonia or the Basque Country and, in addition, Madrid (the capital). Nevertheless, distance-related costs restricted the possibility of a more intensive population distribution. In particular, migrations in many parts of southern Spain remained unexpectedly low, given their very low standards of living with respect to other regions. Furthermore, as the expansion of urban demand for labor in this phase was both slow and unstable (with significant cyclical variations), a considerable proportion of the southern rural population opted for temporary migrations rather than riskier migratory decisions (Carmona and Simpson 2003; Silvestre, 2006). As a result of all the above, an acceptable functioning of the labor markets and rational behavior on the part of individuals were perfectly compatible with moderate rates of migration in a context of high distance-related costs (as a part of tight household budgets) and only a slight expansion of the employment opportunities generated by modern growth[7].

The panorama changed during the phase of rapid modern growth between 1950 and 2000, when employment opportunities in the non-agricultural sectors of the

[7] Substantial wage convergence occurred from 1850 to 1914, despite low rates of internal migration. After World War I and during the 1920s, regional wage convergence was resumed, accompanied by high rates of internal migration (Roses and Sánchez-Alonso, 2004).

economy increased significantly. The limited number of regions which contained the principal poles of growth (Catalonia, the Basque Country, Madrid and various regions bordering the first two of these) thereby experienced internal population redistribution, from the country to the city. Moreover, they had to accommodate large numbers of migrants (usually, but not always, from rural areas) from other regions with lower growth levels and fewer possibilities for non-agricultural job creation. Some historians (Carreras and Tafunell, 2004) suggest that the model proposed by Lewis (1954) is a fitting description of certain dynamics in the Spanish economy in the decades following the Second World War. If this is the case, the intensive migrations of the period and the consequent redistribution of the Spanish population may be interpreted as a simple spatial correlate of the mechanisms driving the model.

The magnitude of the redistribution may be illustrated by the fact that, as Table 3 shows, the share of the country's five most densely populated provinces, which had grown slowly from 18.2 to 27.8% between 1787 and 1950, rocketed to almost 39% by 1981. In the last two decades, this share has increased much more gradually, reflecting a change in migratory patterns. Instead of simple migratory geography based on the imbalance between advanced-industrial regions and backward-agricultural regions, there began to emerge a more complex geography, with a greater variety of migratory routes and motivations (Hierro 2006). This was, moreover, the moment in which some of the principal poles of growth in the Spanish economy, such as Madrid, Barcelona or Bilbao, reached a point at which the advantages derived from agglomeration began to be outweighed by the costs of congestion caused by previous growth. Whatever the case, it is instructive to note that, in spite of all such factors, the weight of the five most densely populated provinces continued to increase between 1981 and 2000.

In reality, as the final column of Table 3 shows, Spanish demographic space increasingly displayed internal differentiation. If the variance of provincial population densities grew slowly until 1950, the intensification of migratory movements from then onwards consolidated a clear divergence between the demographic trajectory of the different provinces. An intriguing aspect of this divergence is that, as Table 3 shows, there exists a very strong correlation between demographic densities at the beginning of modern economic growth (i.e. 1860, approximately) and those at the end of this period. This suggests that, despite the undeniable discontinuities produced by the emergence of a modern system of economic growth (the most notable of which was the unparalleled intensification of interprovincial migrations), strong continuity was evident in the relative position of the different provinces before and after industrialization. The following section provides a more detailed examination of this divergence.

4. Regional population divergence: a typology

In order to establish a typology which provides a better understanding of regional variations in the long-term evolution of population distribution in Spain, we have chosen the cluster method; this classifies the variables of interest we have selected in groups, on the basis of their behavior. The present study includes two groups of variables i.e. those concerning population density and those regarding population growth. Concretely, demographic density has been employed in the three key dates mentioned above (1860, 1950 and 2000) and the rates of population growth in different periods, from the very long-run (1860-2000) to shorter periods, including the two sub-periods of slow modern growth (1860-1950) and rapid modern growth (1950-2000).

Our unit of analysis is Spanish provinces, which were the only official administrative units (except for municipal councils) in Spain between 1833 and 1977, with the advantage that all the necessary data are therefore available. Furthermore, their boundaries have not changed since they were created in 1833; a total of 48 provinces have existed in Spain in this period.

The results of this statistical analysis permit the identification of five principal demographic trajectories within Spain (Table 4), on the basis of the behavior of the variables previously defined for the period 1860-2000.

Three of these trajectories i.e. those identified by the second, fourth and fifth clusters recount the experience of 32 of the 50 Spanish provinces, depicting a basic history of winners and losers in the spatial redistribution of population which accompanies modern growth. The winners were the provinces of Madrid, Barcelona and Biscay (the fourth and fifth clusters), which became great focal points for the reception of internal migrants from other Spanish provinces. The losers were the considerable number of 29 provinces (second cluster) which, having relatively low levels of industrialization and an economy strongly dependent upon the agricultural sector until well into the XX century, experienced out-migration which, on occasion, amounted to depopulation (that is to say, absolute population loss despite the positive sign of natural variation). The contrast between these two trajectories is visible for the phase of slow modern growth, in which the three "winning" provinces headed Spanish industrialization and recorded increasing rates of urbanization, while other provinces experienced slower demographic growth upon traditional economic bases. When, during the phase of rapid modern growth, opportunities in the winning provinces rapidly

expanded, the gap in standards of living between the two types of province produced intensive internal migration. As Table 3 shows, this divergence in inter-provincial demographic trajectories was particularly marked in the period 1950-1981, when the winning provinces attained the greatest growth rates in their history and the losing provinces embarked upon a period of depopulation.

Table 4. Centroids of the clusters

	Clusters				
	1	2	3	4	5
Density 1860	48.0	23.9	61.6	77.6	76.1
Density 1950	75.9	34.9	131.2	264.8	256.7
Density 2000	120.5	33.4	250.6	639.7	511.4
Growth 1860-1900	0.34	0.28	0.64	1.05	1.54
Growth 1900-1930	0.51	0.50	1.08	1.88	1.49
Growth 1950-1981	1.11	-0.40	1.67	2.66	2.38
Growth 1981-2000	0.71	0.05	0.76	0.39	-0.22
Growth 1860-1950	0.49	0.41	0.93	1.39	1.36
Growth 1950-2000	0.95	-0.23	1.32	1.79	1.39
Growth 1860-2000	0.65	0.18	1.07	1.53	1.37

An interesting feature of this contrast is, moreover, the significant difference which already existed between the two types of province prior to the onset of industrialization and modern growth. The provinces which headed modern growth were characterized by relatively high population, already exceeding 75 inhabitants per square kilometer by 1860. The provinces which would lose population, by contrast, were already lightly populated by that date, with less than 25 inhabitants per square kilometer. This contrast shows to what extent industrialization and modern growth did not create, in Spain, their own geography of demographic disparities, but instead

tended to reinforce variations which had long existed, probably since the end of the XVII century (Ayuda, Collantes and Pinilla, 2005).

This simple account of winners and losers may be made somewhat more complex in order to adequately incorporate other typologies of change. The remaining 18 Spanish provinces (first and third clusters) took an intermediate path. Such provinces did not become great focal points of attraction for internal migrants from other provinces, but neither did they undergo processes of depopulation. In fact, their population increased steadily in the long run, and more intensively during the phase of rapid modern growth than previously. In particular, during the period 1981-2000, the population growth of these provinces came to exceed that of traditionally very expansive provinces. This result conceals various subtypologies, but the most important of these was that represented by the Mediterranean provinces which, given their favorable geographical endowments (coastline, a large annual number of days of sunshine, etc.) saw their residential and touristic potential reinforced. Thus, although many of these provinces remained discreetly in the background during the phase of economic growth dominated by industry, they have subsequently attained a leading role in the framework of an increasingly service-oriented economy. In fact, in the period 1981-2000, the traditional poles of growth of Madrid, Barcelona and Biscay have displayed symptoms of exhaustion, which in the last of these cases has even led to a loss of population in absolute terms. However, this pattern reflects more a change of leadership within the group of provinces which already had high population densities than a serious reconstruction of the relative positions of the distinct provinces.

5. Concluding remarks

In his stylized studies of modern growth, Kuznets (1966) proposed that income distribution inequalities followed an inverted U-curve throughout the industrialization process, in such a way that they intensified in the initial stages and, once their maximum had been reached, tended to diminish in the final stages of the process. In a highly influential article, Williamson (1965) found a similar tendency for regional economic inequalities in a wide sample of countries. The evidence reviewed in the present article suggests, nevertheless, that the picture painted by Williamson (1965), although it may be appropriate for income levels per habitant or the concentration of economic activity, is not so for demographic trends.

Thus, in the majority of the European countries analyzed for the period 1850-2000, the population densities of the various regions have tended to diverge over time.

In other words, the initial part of the inverted-U curve is evident, but the final part is not. This result is easy to reconcile with Williamson's, insofar as that increasing divergence of population densities is compatible with convergence in terms of GDP per capita. This is because a substantial part of internal migrations during the process of industrialization may be explained using homeostatic disequilibrium models, as Kuznets himself anticipated. However, our results provide a very different image of regional disparity: the convergence in per capita variables was at the cost of an increasing regional imbalance in terms of their demographic dynamism.

Spain illustrates the above well; its divergence in regional demographic dynamics has been a constant feature throughout the period characterized by modern economic growth i.e. from (approximately) the mid-XIX century until today. This has been due to the spatial disparity existing at the onset of modern growth and to the effectiveness with which migratory movements have responded to the gaps in living standards derived from this spatial disparity, transferring population from backward to advanced regions. These migratory movements intensified during the second half of the XX century, a phase of particularly rapid growth which also witnessed regional convergence in terms of GDP per capita. In this fashion, while the final part of Williamson's inverted-U curve was being drawn, the population disparity curve increased to record levels. Thus, although in a certain sense Spanish regions were drawing closer together, in another their trajectories had never diverged so far.

References

Ayuda M I, Collantes F and Pinilla V (2005) From Locational Fundamentals to Increasing Returns: The Spatial Concentration of Population in Spain, 1787-2000. Working Paper 2005-05, Faculty of Economics and Business Studies, University of Zaragoza.

Barro R J and Sala-i-Martin X (1992) Convergence. Journal of Political Economy 100/2: 223-251

Beeson P E; Dejong D N and Troesken W (2001) Population growth in U.S. counties, 1840-1990. Regional Science and Urban Economics 31: 669-699.

Bell D (1974) The coming of post-industrial society: a venture in social forecasting. Heinemann, London.

Boyer G R (1997) Labour migration in southern and eastern England, 1861-1901. European Review of Economic History 1: 191-215.

Camarero L (1993) Del éxodo rural y del éxodo urbano. Ocaso y renacimiento de los asentamientos rurales en España. Ministerio de Agricultura, Pesca y

Alimentación, Madrid.

Carmona J and Simpson J (2003) El laberinto de la agricultura española. Instituciones, contratos y organización entre 1850 y 1936. Prensas Universitarias de Zaragoza, Zaragoza.

Carreras A and Tafunell X (2004) Historia Económica de la España Contemporánea. Crítica, Barcelona.

Ciccone A and Hall R E (1996) Productivity and the density of economic activity. *American Economic Review* 86, 1: 54-70

Collantes F and Pinilla V (2003) La evolución a largo plazo de la población española, 1860-2000: Tipología provincial y análisis del caso aragonés, in Políticas Demográficas y de Población. Gobierno de Aragón, Zaragoza: 41-70.

Cos O and Reques P (2005) Los cambios en los patrones territoriales de la población española (1900-2001). Papeles de Economía Española 104: 167-192.

Crafts N and Mulatu A (2005) What explains the location of industry in Britain, 1871–1931? Journal of Economic Geography 5/4: 499-518.

Davis D and Weinstein D (2002) Bones, bombs and break points: the geography of economic activity. *American Economic Review* 92, 5: 1269-1289.

De Vries J (1984) European urbanization 1500-1800. Methuen, London.

Delgado M. (2004) La evolución demográfica de España en el contexto internacional. Información Comercial Española 815: 13-30.

Duranton G and Puga D (2004) Micro-foundations of Urban Agglomeration Economies, in J V Anderson and J F Thisse (eds), Handbook of Regional and Urban Economics, vol. 4, Cities and Geography. Elsevier, Amsterdam: 2063-2118.

Fujita M and Thisse J F (2002) Economics of Agglomeration. Cambridge University Press, Cambridge.

Fujita M, Krugman P and Venables A P (1999) The Spatial Economy. Massachusetts Institute of Technology, Cambridge.

Goerlich F J and Mas M (eds.) (2006) La localización de la población española sobre el territorio. Un siglo de cambios. Un estudio basado en series homogéneas (1900-2001). Fundación BBVA/Nerea, Bilbao.

Grant O (2000) Internal migration in Germany, 1870-1913. Unpublished Ph.D thesis., University of Oxford.

Greenwood M J (1997) Internal Migration in Developed Countries, in M R Rosenzweig and O STARK (eds.) Handbook of Population and Family Economics, vol. 1b. Elsevier Science, Amsterdam: 647-719.

Henderson V J; Shalizi Z and Venables A J (2001) Geography and Development. Journal of Economic Geography 1: 81-105.

Hohenberg P M (2004) The Historical Geography of European Cities: An Interpretive Essay in V J Henderson and J F Thisse (eds.), Handbook of Regional and Urban Economics, vol. 4, Cities and Geography. Elsevier, Amsterdam: 3021-3052.

Krugman P (1991) Increasing Returns and Economic Geography. Journal of Political Economy 99, 3: 483-499.

Lewis W A (1954) Economic Development with Unlimited Supplies of Labour. Manchester School of Economics and Social Studies 22 (2): 139-191.

Mitchell B R (2003) International Historical Statistics Europe 1750-2000.Macmillan, London.

Mouqué D (ed.) (2004) Sixth Periodic Report on the Social and Economic Situation and Development of Regions in the European Union, http://europa.eu.int/comm/regional_policy/sources/docoffic/official/reports/toc_en.htm.

Nadal J (ed.) (2003) Atlas de la industrialización de España 1750-2000. Crítica, Barcelona.

Pascual P and Sudrià C (2002) El difícil arranque de la industrialización (1840-1880), in F Comín et al. (eds.), Historia Económica de España. Siglos X-XX. Crítica, Barcelona: 203-241.

Prados de la Escosura L (2003) El Progreso Económico de España (1850-2000). Fundación BBVA, Madrid.

Rappaport J and Sachs J (2003) The United States as a Coastal Nation. Journal of Economic Growth 8: 5-46.

Recaño J (2004) Migraciones internas y distribución espacial de la población española, in J Leal (ed.), Informe sobre la situación demográfica en España. Fundación Fernando Abril Martorell, Madrid: 187-230.

Reher D S (2004) Población y sociedad en España durante el siglo XX in J Leal (ed.), Informe sobre la situación demográfica en España. Fundación Fernando Abril Martorell, Madrid: 59-84.

Ringrose D (1996) Spain, Europe, and the "Spanish miracle", 1700-1900. Cambridge University Press, Cambridge.

Rosenthal S S and Strange W C (2004) Evidence on the Nature and Sources of Agglomeration Economies in V J Henderson and J F Thisse (eds.), Handbook of Regional and Urban Economics, vol. 4, Cities and Geography. Amsterdam: Elsevier: 2119-2172.

Rosés J R (2003) Why Isn't the Whole of Spain Industrialized? New Economic Geography and Early Industrialization, 1797-1910. Journal of Economic History

63, 4: 995-1022.

Rosés J R; Sánchez-Alonso B (2004) Regional Wage Convergence in Spain 1850-1930. Explorations in Economic History 41, 4: 404-425.

Silvestre J (2001) Viajes de corta distancia: una visión espacial de las migraciones interiores en España, 1877-1930. Revista de Historia Económica, 19, 2: 247-83.

Silvestre J (2005) Internal migrations in Spain, 1877-1930". European Review of Economic History, 9: 233-265.

Silvestre J (2006) Temporary Internal Migrations in Spain: 1860-1930. Mimeo.

Tirado D, Paluzie E and Pons J (2002) Economic integration and industrial location: the case of Spain before World War I. Journal of Economic Geography 2: 343-363.

Williamson J G (1965) Regional inequality and the process of national development: a description of the patterns. Economic Development and Cultural Change 13: 3-45.

Appendix 1: sources and details

The database used for calculations in Tables 1, 2, 3 and 4 has been constructed for the following spatial units and the following precise dates: British (English, Welsh, Scottish) old counties for 1851 and 1961; French departments for 1861 and 1999; Swedish counties for 1860 and 1990; Swiss cantons for 1850 and 2000; Belgian provinces for 1856 and 2003; Italian provinces for 1871 and 1991; Portuguese regions for 1878 and 1991; and Spanish provinces for 1860 and 2000. The sources are Mitchell (2003), Collantes and Pinilla (2003), www.insee.fr, www.statistik.admin.ch, www.starbel.fgov.be, www.citypopulation.de.

Appendix 2. Population densities and average annual population growth rates in the Spanish provinces, 1860-2000

	Population density			Growth rate	
	1860	1950	2000	1860-1950	1950-2000
Álava	32	39	95	0.2	1.8
Albacete	14	27	24	0.7	-0.2
Alicante	67	109	256	0.5	1.7
Almería	36	41	60	0.1	0.8
Asturias	51	84	102	0.6	0.4
Ávila	21	31	20	0.4	-0.9
Badajoz	19	38	30	0.8	-0.4
Baleares	55	85	180	0.5	1.5
Barcelona	94	289	617	1.3	1.5
Burgos	24	28	25	0.2	-0.2
Cáceres	15	28	20	0.7	-0.6
Cadiz	53	95	155	0.6	1.0
Cantabria	42	77	85	0.7	0.2
Castellón	40	49	84	0.2	1.1
Ciudad Real	13	29	24	0.9	-0.4
Cordoba	26	57	56	0.9	0.0
La Coruña	71	121	141	0.6	0.3
Cuenca	13	20	12	0.4	-1.1
Gerona	53	56	98	0.1	1.1
Granada	35	62	66	0.6	0.1
Guadalajara	17	17	14	0.0	-0.4
Guipúzcoa	82	188	342	0.9	1.2
Huelva	18	36	46	0.8	0.4

Huesca	17	15	14	-0.1	-0.2
Jaén	27	57	47	0.8	-0.4
León	22	35	32	0.5	-0.2
Lérida	26	27	31	0.0	0.3
Lugo	44	52	37	0.2	-0.7
Madrid	61	241	662	1.5	2.0
Malaga	61	103	181	0.6	1.1
Murcia	34	67	103	0.8	0.9
Navarre	29	37	53	0.3	0.7
Orense	51	64	48	0.3	-0.6
Palencia	23	29	22	0.3	-0.6
Palmas (Las)	23	92	243	1.5	2.0
Pontevedra	99	150	195	0.5	0.5
Rioja (La)	35	46	53	0.3	0.3
Salamanca	21	33	29	0.5	-0.3
Santa Cruz de Tenerife	42	123	260	1.2	1.5
Segovia	21	29	21	0.4	-0.6
Seville	34	79	125	0.9	0.9
Soria	15	16	9	0.1	-1.1
Tarragona	51	57	96	0.1	1.0
Teruel	16	16	9	0.0	-1.1
Toledo	21	34	34	0.5	0.0
Valencia	57	125	207	0.9	1.0
Valladolid	30	43	62	0.4	0.8
Vizcaya (Biscay)	76	257	511	1.4	1.4
Zamora	24	30	19	0.3	-0.9
Zaragoza	23	36	51	0.5	0.7
Total Spain	31	55	81	0.6	0.8

Source: Collantes and Pinilla (2003), pp. 64-67.

Apendix 3. Cluster memberhip (Spanish provinces)

Province	Cluster	Distance
Álava	1	47.6
Asturias	1	20.2
Baleares	1	60.6
Cádiz	1	39.5
Cantabria	1	35.8
Castellón	1	46.0
Coruña (La)	1	54.7
Gerona	1	30.6
Málaga	1	67.9
Murcia	1	24.4
Sevilla	1	15.2
Tarragona	1	31.5
Albacete	2	15.8
Almería	2	30.2
Ávila	2	13.9
Badajoz	2	6.7
Burgos	2	11.1
Cáceres	2	17.6
Ciudad Real	2	16.2
Córdoba	2	31.8
Cuenca	2	28.7
Granada	2	44.4
Guadalajara	2	27.7
Huelva	2	13.9
Huesca	2	28.8
Jaén	2	26.1
León	2	2.4
Lérida	2	8.8
Lugo	2	26.7
Navarra	2	19.9
Orense	2	42.2
Palencia	2	12.8
Rioja (La)	2	25.2
Salamanca	2	5.0
Segovia	2	14.1
Soria	2	32.7
Teruel	2	31.9
Toledo	2	3.3
Valladolid	2	30.6
Zamora	2	15.3
Zaragoza	2	17.5
Alicante	3	23.7
Guipúzcoa	3	109.5
Palmas (Las)	3	55.6
Pontevedra	3	69.3
Santa Cruz deTenerife	3	23.7
Valencia	3	44.5
Barcelona	4	36.6
Madrid	4	36.6

Vizcaya (Biscay)	5	0

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