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New Estimates of Regional GDP in Spain, 1860-1930*

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Abstract:

This paper presents a new regional database on GDP in Spain for the years 1860, 1900, 1914 and 1930. Following Geary and Stark (2002), country level GDP estimates are allocated across Spanish provinces. The results are then compared with previous estimates. Further, this new evidence is used to analyze the evolution of regional inequality and convergence in the long run. According to the distribution dynamics approach suggested by Quah (1993, 1996) persistence appears as a main feature in the regional distribution of output. Therefore, in the long run no evidence of regional convergence in the Spanish economy is found.

JEL Classification: N93, N94, O18, O47, E01

Keywords: regional GDP, economic history, economic growth, convergence, distribution dynamics.

Resumen:

En este trabajo se presenta una estimación del PIB provincial y regional para los años 1860, 1900, 1914 y 1930. La metodología propuesta por Geary y Stark (2002), permite distribuir el PIB per capita español entre las provincias españolas. Los resultados obtenidos se comparan con estimaciones previas del PIB regional llevadas a cabo por otros autores. La nueva evidencia, además, se utiliza para analizar la evolución de las desigualdades regionales en la distribución de la renta así como la convergencia en el largo plazo. A partir del análisis sugerido por Quah (1993, 1996) se observa que la persistencia es una característica destacable en la distribución regional del ingreso. De esta manera, en el largo plazo, no se encuentra evidencia de convergencia regional en la economía española.

1. Introduction

One of the main features of the Spanish economy today is the inequality in the geographical distribution of income per capita. Although this inequality has been well documented since 1955, when the BBV first published the series of regional and provincial GDP, we know very little about its evolution before this date. Since the pioneering work by Kuznets, the study of economic development has relied on the figures of output per capita. In Spain, the lack of data concerning the geographical distribution of GDP in the long run makes the study of regional inequality particularly difficult; we have only a series of estimates for the second half of the nineteenth century and the beginning of the twentieth, and indeed the reliability of these figures has been questioned by several authors, though in fact they reflect quite well our qualitative knowledge of the evolution of regional economies[1].

The aim of this paper is to begin to fill this gap, and to present a new database for regional GDP in Spain at two different levels of aggregation, by Autonomous Communities (NUTS-II), and by provinces (NUTS-III) for the years 1860, 1900, 1914 and 1930[2]. In order to do this, we will use the methodology developed by Geary and Stark (2002). In a recent study, these authors distributed the British GDP across countries for the period prior to WWI.

This paper is structured as follows. In the next section, we present the method applied by Geary and Stark in detail. We then describe the data needed

[1] Álvarez Llano (1986). For a critical evaluation of these data, see Carreras (1990). For 1930, Alcaide (2003).

[2] The study includes 49 Spanish provinces, since the two provinces within the Canary Islands are counted as one. Ceuta and Melilla are excluded from the analysis.

to estimate GDP, paying attention to how information has been collected from different sources and making our assumptions explicit. In section four, the estimates of regional GDP and GDP per capita in the long run are shown. The figures are then compared with previous estimates made by other authors. In section five, we present some descriptive exercises with the new evidence to study the evolution of regional inequality and the existence of convergence in the long run, starting from the methodology suggested by Quah (1993, 1996). Finally, section six concludes.

2. Methodology.

The analysis of economic development depends on the availability of output figures. The further in time we go back, the greater the statistical deficiencies and the harder it is to estimate GDP using standard methods. As a result, economic historians have had to resort to indirect estimation[3]. The methodology proposed by Geary and Stark for the estimation of output is based on two variables: labour force and productivity, grouped by sector (agriculture, industry and services), and by countries. When applied to Spain, the total GDP of the Spanish economy is the sum of provincial GDPs

$$Y_{ESP} = \sum^{i} Y_i \quad (1)$$

where Y_i is the provincial GDP defined as

[3] Beckerman and Bacon (1966), Bairoch (1976), Crafts (1983), Good (1994), Schulze (2000) or Prados (2000). For regional estimates, Esposto (1997).

$$Y_i = \sum^{j} y_{ij} L_{ij} \qquad (2)$$

y_{ij} being the output or the average added value per worker in each province i, in sector j, and L_{ij} the number of workers in each province and sector. As we have no data for y_{ij}, this value is proxied by taking the Spanish sectoral output per worker (y_j), assuming that provincial labour productivity in each sector is reflected by its wage relative to the Spanish average (w_{ij}/w_j). Therefore, we can assume that the provincial GDP will be given by

$$Y_i = \sum^{j} \left[y_j \beta_j \left(\frac{w_{ij}}{w_j} \right) \right] L_{ij} \qquad (3)$$

where, as suggested by these authors, w_{ij} is the wage paid in the province i in sector j, w_j is the Spanish wage in each sector j, and β_j is a scalar which preserves the relative province differences but scales the absolute values so that the provincial total for each sector adds up to the known total for Spain. This model of indirect estimation, based on wage incomes, allows an estimation of GDP by province at factor cost, in current pesetas.

3. Data.

The equation described above requires the following data in order to estimate the provincial GDP: a series of the sectoral structure of employment on a provincial level, an estimate of output in each sector for Spain, and finally a series of provincial wages per sector.

First, the series concerning employment by sector in each province is compiled from the information provided by the 1860, 1900, 1910 and 1930 Population Censuses. Second, the output per worker in Spain requires the data for the sectoral output at factor cost, which is obtained from Prados (2003), and for the total amount of workers per sector in the Spanish economy; once more, we find this information in the respective Population Censuses. The third data set, nominal wages by province, presents greater difficulties. The sources searched and steps taken to estimate them are detailed next, by analysing the agricultural and industrial wages separately.

Agricultural nominal wages come from two different sources: Sánchez-Alonso (1995) and Bringas (2000). Agricultural wages for the year 1860 are given by Sánchez-Alonso[4]. Agricultural wages for the remaining years selected were obtained from Bringas (2000). For 1900, the original source is the emigration statistics published by the Instituto Geográfico y Estadístico (1903)[5]. For 1914 and 1930, the figures offered by Bringas come from official sources and are published in the Anuarios Estadísticos from 1914 to 1931[6]. The gap for wages in certain provinces in the year 1930 is filled by turning to the interpolations in Silvestre (2003)[7].

Agricultural wage series occasionally show exceptionally high figures. This is the case in the provinces of Logroño and Pontevedra in 1897, and that of Castellón and Lérida in 1930. In all cases, their wages exceed the standard deviation of the average in the sample, also presenting higher values than those

[4] Sánchez-Alonso (1995), pp. 302-303. The data show "Salarios agrícolas, años 1849-1856", irrespective of sex. The original sources are Moral Ruiz (1979) and García Sanz (1980).
[5] "Jornal medio de los obreros agrícolas en las poblaciones de menos de 6.000 habitantes en el año de 1897", IGE (1903), pp. XLVII-XLIX.
[6] "Jornales medios diarios masculinos", Bringas (2000), pp. 180-183.
[7] Silvestre (2003), p. 338, offers information for Ávila, Badajoz, Madrid, Santander, Segovia and Valencia in 1930.

of the nearest provinces. These wages are corrected by a simple average of the wages in the neighbouring provinces.

For nominal wages in industry, three sources have been consulted: Madrazo (1984), Sánchez-Alonso (1995) and Silvestre (2003). Industrial wages for 1860 are given by Madrazo[8]. Figures for ten professional categories involved in the building of roads are offered. Six of them are quite well represented across provinces (apprentice, unskilled labourer, mason, bricklayer, carpenter and miner). The industrial wage for 1860 comes from a simple average of three categories established according to level of skill[9]: bricklayers (skilled workers), unskilled workers, and apprentices.

However, some problems arise. The geographical coverage of bricklayers is high but we do not have information for their wages in six provinces[10]. In order to fill this gap, we use data for the most similar professional category for which Madrazo offers information, that is, masons. The wages of bricklayers in these six provinces are calculated from the wages of masons, and their deviation from the average wages for masons in Spain, weighted by the industrial population of each province according to the Population Census of 1860.

On the other hand, as no wages are provided for any professional category in Navarre, they must be estimated. It would be reasonable to think that there might be a wage gradient depending on geographical proximity. Indeed, for the rest of the years available, it is confirmed that the industrial wage in Navarre is close to the average wage of the neighbouring provinces. Therefore, the

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[8] "Jornales de los obreros de la construcción de carreteras durante el año 1860 en reales de vellón", Madrazo (1984), p. 208.

[9] Here we aim to obtain the highest degree of homogeneity with the wages in Silvestre (2003). A simple average is used, given that no data on active population in each occupation are available, and so the average cannot be weighted.

[10] Guipúzcoa, Lugo, Orense, Oviedo, Vizcaya and Zamora.

industrial wage in Navarre in 1860 is calculated as being the average wage in the neighbouring provinces[11].

Industrial wages in 1900 come from Sánchez-Alonso (1995)[12]. Regarding the data of IGE (1903), Simpson (1995) defines them as semi-skilled workers and he points out two provinces with excessively high wages: Pontevedra and Toledo[13]. The values have therefore been corrected by re-calculating in both cases their wages as the average of the industrial wage in the neighbouring provinces.

Finally, industrial wages in 1914 and 1925 are given by Silvestre (2003)[14]. This author provides data for nominal wage per hour weighted by the active population in each occupation according to different categories: skilled male workers, skilled female workers, unskilled labourers and apprentices (male and female). For 1930, the hourly wages in 1925 are used, because for subsequent years the average cannot be weighted among occupations since no data are available on the active population in each one. Another obstacle now has to be overcome: the inexistence of industrial wages for the Canary Islands. For 1914, it is assumed that the industrial wage in the Canary Islands is similar to that of the lowest one among the Spanish provinces (0.28 pta per hour). For 1925, the increase in the industrial wage is also assumed to be similar to that of the Spanish economy as a whole.

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[11] As a test for this result, we use wages in 1897, the closest available date. In that year, the industrial wage in Navarre was 3% higher than the Spanish average weighted by the industrial population. If this percentage is applied to the Spanish value for 1860, the figure obtained almost coincides with the one previously calculated.

[12] "Jornales fabriles en las capitales de provincia (pesetas) en 1896-1897", Sánchez-Alonso (1995), pp. 294-295. The original source is, again, IGE (1903), pp. XLVII-XLIX.

[13] Simpson (1995), p. 190 and p. 199, respectively.

[14] Silvestre (2003), pp. 341-342. Data come from *Estadísticas de los Salarios y Jornadas de Trabajo*, Ministerio de Trabajo (1927).

Nor do we have information on wages in the service sector in Spanish provinces. Following Geary and Stark, who faced the same problem in their study of the British and Irish economies, the service sector wages are calculated as a weighted average of agriculture and industry series in each province, where the weights are each sector's share of the labour force[15].

Wages in the Geary and Stark equation are relative wages with respect to the Spanish total, defined as the ratio between the nominal wage by sector in a province and the average nominal wage by sector in Spain. The Spanish wage is obtained as an average of the wages in the 49 provinces.

To conclude this section, we stress that the methodology used and the lack of data, particularly for wages, force us to make three main assumptions: first, relative wages accurately reflect the relative average productivity across sectors and provinces for all employees; second, the series of wages, not homogeneous throughout time, are representative of agriculture and industry; third, service sector wages can be represented by a weighted average of agriculture and industry wages[16].

4. Results.

Applying these data to Geary and Stark's equation, we present a first estimation of the Spanish regional GDP in the selected years in Table 1. Figures are shown on a regional aggregation level which coincides with present Autonomous Communities, NUTS-II.

[15] Geary and Stark (2002), p. 923.

[16] 'As regards the use of nominal wages, to the extent that there are regional variations in price levels then there will also be bias. *A priori*, it is not possible to assess the net effect of these biases, tests confirm that the method produces acceptable results', Geary and Stark (2002), pp. 933-934.

Table 1.
Estimates of regional GDP at factor cost, current prices, million pts (as a % of total Spanish GDP* in parentheses)

	1860	1900	1914	1930
Andalucía	1,201 (20.75)	1,609 (16.41)	2,336 (17.67)	5,302 (15.69)
Aragón	320 (5.53)	442 (4.51)	518 (3.92)	1,524 (4.51)
Asturias	164 (2.83)	296 (3.02)	384 (2.91)	1,400 (4.14)
Baleares	94 (1.62)	136 (1.38)	287 (2.17)	539 (1.59)
Canarias	76 (1.32)	159 (1.62)	233 (1.76)	648 (1.92)
Cantabria	83 (1.43)	182 (1.86)	210 (1.59)	583 (1.73)
Castilla La Mancha	401 (6.92)	511 (5.21)	666 (5.04)	1,676 (4.96)
Castilla y León	616 (10.63)	838 (8.55)	1,061 (8.03)	2,365 (7.00)
Cataluña	851 (14.69)	1,971 (20.11)	2,582 (19.53)	6,817 (20.17)
C. Valenciana	455 (7.86)	777 (7.93)	921 (6.96)	2.439 (7.22)
Extremadura	203 (3.51)	353 (3.60)	394 (2.98)	981 (2.90)
Galicia	459 (7.92)	805 (8.21)	1,079 (8.16)	2,660 (7.87)
Madrid	350 (6.04)	732 (7.46)	1,170 (8.85)	3,443 (10.19)
Murcia	124 (2.13)	173 (1.76)	291 (2.20)	730 (2.16)
Navarra	142 (2.45)	156 (1.59)	200 (1.51)	534 (1.58)
País Vasco	198 (3.43)	563 (5.74)	775 (5.87)	1,905 (5.64)
Rioja, La	54 (0.94)	101 (1.03)	113 (0.86)	249 (0.74)
Spain	**5,791**	**9,804**	**13,220**	**33,795**

*Note: * Ceuta and Melilla excluded.*
Source: See text.

Nevertheless, some of Geary and Stark's assumptions may cause problems, particularly regarding the estimation of wages in the service sector as a weighted average of agriculture and industry series, where the weight used is the proportion of labour force in each sector. To contrast the validity of this assumption we can proceed in two alternative ways. First, we can use the relation between industry and service wages, derived from the data offered by Alcaide (2003) for 1930. From this proportion, service sector wages are obtained in that year to calculate the regional GDP (column 2). Second, from a reliable source such as the Fundación BBV (1999) and its series *Renta Nacional en España y su distribución provincial*, this relation is obtained for the nearest date available, corresponding to 1955. This proportion is then applied to the 1930 data in order to estimate the service sector wage (column 3). The comparison of the results (Table 2) shows that the differences between the estimates presented are in general quite small[17]. Thus, it seems reasonable to suppose that Geary and Stark's assumption about service sector wages does not generate a great distortion[18].

Table 2. Regional shares of Spanish GDP in 1930, alternative estimates.

	New Estimates (I)		Estimates using 1930 services wages from Alcaide (II)		Estimates using 1955 services wages from BBV (III)		(II) / (I)	(III) / (I)
Andalucía	5,302	15.69	5.307	15.70	5,342	15.81	1.00	1.01
Aragón	1,524	4.51	1,524	4.51	1,523	4.51	1.00	1.00
Asturias	1,400	4.14	1,340	3.96	1,324	3.92	0.96	0.95
Baleares	539	1.59	547	1.62	542	1.60	1.01	1.01
Canarias	649	1.92	619	1.83	632	1.87	0.95	0.97
Cantabria	583	1.73	595	1.76	587	1.74	1.02	1.01
Castilla La Mancha	1,676	4.96	1,724	5.10	1,733	5.13	1.03	1.03
Castilla y León	2,365	7.00	2,615	7.74	2,631	7.79	1.11	1.11
Cataluña	6,817	20.17	6,654	19.69	6,595	19.51	0.98	0.97
C. Valenciana	2,439	7.22	2,473	7.32	2,460	7.28	1.01	1.01
Extremadura	981	2.90	996	2.95	1,010	2.99	1.02	1.03
Galicia	2,660	7.87	2,803	8.29	2,781	8.23	1.05	1.05
Madrid	3,443	10.19	3,358	9.94	3,366	9.96	0.98	0.98
Murcia	730	2.16	747	2.21	777	2.30	1.02	1.06
Navarra	534	1.58	482	1.43	496	1.47	0.90	0.93
País Vasco	1,906	5.64	1,757	5.20	1,739	5.14	0.92	0.91
Rioja, La	249	0.74	256	0.76	258	0.76	1.03	1.04
Spain	**33,795**	**100**	**33,795**	**100**	**33,795**	**100**	**1.00**	**1.00**

[17] Only Castilla y León shows discrepancies slightly above 10%, suggesting that, in this region, the wage for the service sector could be underestimated.

[18] In this respect, Geary and Stark (2002) use their methodology to replicate the official incomes by country in the 1970s, when the whole set of data necessary exists. They conclude that 'the errors are within those tolerated in national income accounting', pp. 921 and 925.

Source: Column 1 as in Table 1; wages for Column 2 are derived from 'Costes laborales' and 'Empleo asalariado', in Alcaide (2003), pp. 270-289 and 188-207, respectively; wages for Column 3 from 'Costes laborales' and 'Empleo asalariado', in BBV (1999), pp. 122-149 and 178-205, respectively.

However, this estimation of the service sector wages may present some inaccuracies in the results obtained for Madrid[19], an economy strongly dependent on tertiary activities[20]. It is therefore worth testing whether or not the wages estimated for Madrid in the service sector are appropriate. In order to do so, we use the wages quoted by Reher and Ballesteros (1993) for Madrid municipal workers belonging to twelve different occupations[21]. These data are only available as an index number of the average wage for these twelve categories, based on 1913, and not in monetary units. The evolution of both magnitudes in the two first years (1900 and 1913) is quite similar, and only in the corresponding observation for 1930 is the discrepancy significant. Service sector wages seem to have experienced a lower increase than assumed. The next step is to apply the growth derived from the series by Reher and Ballesteros between 1914 and 1930 to the wages previously estimated for Madrid in 1914. By doing so, we find the new service sector wage in the capital of Spain for 1930 falls from 7.32 to 6.12 pesetas per day. As a consequence, the new GDP estimation, with wages corrected, shows that Madrid's participation in Spanish GDP falls by one percentage point. Furthermore, in terms of GDP per capita in 1930, Madrid no longer heads the Spanish ranking, losing first place to Catalonia[22].

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[19] Although differences in wages for Madrid in Table 2 are small (2%).

[20] Between 1860 and 1920, around half of the active population in Madrid worked in the service sector. That proportion rose to 60% in the 1930 Census of Population.

[21] These occupations are: officer, unskilled labourer, foreman, assistant, manual worker, sweeper, night watchman, secretary, government employee, dean, doctor and medical assistant.

[22] See Table A.1 in the Appendix.

In Table 3, the new estimates of regional GDP are compared to figures offered previously by other authors. The comparison is drawn, for the matching years, with the percentage of regional participation in Spanish GDP in Álvarez Llano for 1860, 1900 and 1930, and with Alcaide's estimates for 1930.

Table 3.
Regional structure of Spanish GDP (%), different estimates
(as a proportion in parentheses)

	Álvarez Llano 1860	New Estimates 1860	Álvarez Llano 1901	New Estimates 1900	Álvarez Llano 1930	Alcaide 1930	New Estimates 1930
Andalucía	21.6	20.75 (0.96)	16.77	16.41 (0.98)	14.87	14.68	15.69 (1.05) (1.07)
Aragón	5.8	5.53 (0.95)	5.10	4.51 (0.88)	4.47	4.42	4.51 (1.01) (1.02)
Asturias	2.1	2.83 (1.35)	3.20	3.02 (0.94)	2.75	3.91	4.14 (1.51) (1.06)
Baleares	1.5	1.62 (1.08)	1.36	1.38 (1.02)	1.52	2.05	1.59 (1.05) (0.78)
Canarias	0.8	1.32 (1.64)	1.27	1.62 (1.28)	1.46	2.29	1.92 (1.31) (0.84)
Cantabria	1.5	1.43 (0.95)	1.91	1.86 (0.97)	1.34	1.42	1.73 (1.29) (1.22)
Castilla LM	7.3	6.92 (0.95)	6.51	5.21 (0.80)	6.46	5.37	4.96 (0.77) (0.92)
Cast.y León	11.4	10.63 (0.93)	11.42	8.55 (0.75)	9.51	9.68	7.00 (0.74) (0.72)
Cataluña	13.3	14.69 (1.10)	16.27	20.11 (1.24)	21.38	18.15	20.17 (0.94) (1.11)
C. Valenciana	7.7	7.86 (1.02)	7.66	7.93 (1.03)	9.72	8.53	7.22 (0.74) (0.85)
Extremadura	3.6	3.51 (0.98)	3.35	3.6 (1.07)	3.73	3.04	2.90 (0.78) (0.95)
Galicia	5.9	7.92 (1.34)	7.14	8.21 (1.15)	6.05	7.69	7.87 (1.30) (1.02)
Madrid	9.6	6.04 (0.63)	9.12	7.46 (0.82)	6.98	7.93	10.19 (1.46) (1.29)
Murcia	1.9	2.13 (1.12)	2.25	1.76 (0.78)	1.95	2.07	2.16 (1.11) (1.04)
Navarra	1.9	2.45 (1.29)	1.71	1.59 (0.93)	1.63	1.72	1.58 (0.97) (0.92)
País Vasco	3.0	3.43 (1.14)	4.00	5.74 (1.44)	5.40	6.00	5.64 (1.04) (0.94)
Rioja, La	1.1	0.94 (0.86)	0.96	1.03 (1.08)	0.78	1.05	0.74 (0.94) (0.70)

Source: Table 1; Álvarez Llano (1986), pp. 37 and 43; Alcaide (2003), pp. 250-251.

In terms of the magnitude of the difference, the evolution of the Canary Islands, which in the new estimates presents a much better position than the one given by Álvarez Llano, stands out. Galicia also presents an improvement, though to a lesser degree. The discrepancy is also high in Madrid, for which the previous data suggested a prominent position by the middle of the nineteenth century, much higher than the one obtained in this study[23]. In contrast, by 1930 the new figures offer a more positive view for Madrid than the one offered by Álvarez Llano. In the case of Asturias, the differences are significant in 1860, but particularly so in the estimation for 1930, when the province shows a substantial increase. Likewise, with these new data, growth in the two largest industrial regions in the Spanish economy, Catalonia and the Basque Country, is more vigorous throughout the second half of the nineteenth century. In contrast, in the case of the two *Castillas* the new figures show a lower participation not only in 1900 but in 1930 as well. Finally, other significant discrepancies arise in certain years in Navarre, for example, in 1860, with more favourable values; by 1930, estimates for Cantabria reveal a higher income, and in that same year, the relative participation of Valencia and Extremadura in Spanish GDP was lower than in the previous estimates.

Discrepancies with Alcaide's estimates in 1930 are, on the whole, smaller. The significant differences observed in that year between our results and those of Álvarez Llano for the regions of Asturias, Castilla La Mancha, Extremadura and Galicia are notably reduced, and the differences with respect to other Autonomous Communities such as the Canary Islands, Valencia and Madrid are also smaller. However, discrepancies are still considerable in La Rioja (0.30), Castilla y León (0.28), Madrid (0.28), Cantabria (0.22) and Balearic Islands (0.22).

The information provided by Population Censuses, together with the new GDP estimates for the Spanish NUTS-II regions, allow us to present the evolution of GDP per capita over the years (Table 4). Data for 1955, 1975 and

[23] One of the most recurrent criticisms of Álvarez Llano's data is the high value offered for Madrid in 1860. See Carreras (1990), p. 10.

1995 have been added to the new estimates in order to present a long term view. In this case, the data do not refer to indirect estimates, but to the figures on Gross Added Value at factor cost provided by BBVA (1999 and 2000).

Table 4. Regional GDP per head, 1860-1995 (Spain = 100).

	1860	1900	1914	1930	1955	1975	1995
Andalucía	109	86	93	80	68	72	68
Aragón	97	92	82	103	98	101	108
Asturias	82	89	85	123	111	101	87
Baleares	94	83	133	103	121	129	140
Canarias	87	84	79	81	75	83	101
Cantabria	102	125	104	112	115	102	90
Castilla La Mancha	89	70	65	64	66	78	80
Castilla y León	80	69	68	67	83	84	89
Cataluña	137	190	187	170	159	128	124
C. Valenciana	96	93	81	90	112	100	101
Extremadura	79	76	60	59	56	58	68
Galicia	69	77	79	83	70	76	83
Madrid	193	179	201	173	155	133	136
Murcia	87	57	71	79	69	83	82
Navarra	128	96	96	108	115	115	121
País Vasco	125	177	173	149	177	134	110
Rioja, La	84	101	91	85	109	105	118
CV	0.29	0.40	0.43	0.34	0.35	0.23	0.22
5 max / 5 min	1.76	2.22	2.33	2.09	2.22	1.74	1.68
max / min	0.87	0.39	0.97	0.93	1.03	1.15	0.86

Source: For 1860-1930, see text; for 1955-1975, derived from BBV (1999), pp. 120 and 284; for 1995, BBVA (2000), pp. 124 and 128.

On the whole, when considering the regional development in Spain according to the evolution of GDP per capita in the long term, a striking aspect is its stability over time. Table 5 shows the Autonomous Communities at the two extremes of the ranking in the years considered. If we look at the regions that have been at the top and at the bottom of the list throughout the period, we see that Madrid, Catalonia and the Basque Country have always (barring occasional exceptions) been among the richest regions, usually accompanied by the Balearic Islands, Navarre and Cantabria. At the other end of the scale, six regions have occupied the lowest positions: Extremadura, an ever-present, and Castilla La Mancha, Murcia and Galicia, in six out of seven years, Andalusia since the first third of the twentieth century and Castilla y León in the period prior to the Civil War[24].

These results raise several questions. Have Spanish regions converged over the last century and a half, or has regional inequality persisted? When did this inequality begin? How has it evolved in the long term, and in different historical periods? Is it possible to speak of persistence in inequality patterns? The aim of the following section is to provide some answers to these questions.

Table 5. Regions with the highest and lowest GDP per capita*.

1860	1900	1914	1930	1955	1975	1995
Madrid	***Cataluña***	***Madrid***	***Madrid***	***País Vasco***	***Madrid***	***Baleares***
Cataluña	***Madrid***	***Cataluña***	***Cataluña***	***Cataluña***	***País Vasco***	***Madrid***
Navarra	***País Vasco***	***País Vasco***	***País Vasco***	***Madrid***	***Baleares***	***Cataluña***
País Vasco	***Cantabria***	***Baleares***	Asturias	***Baleares***	***Cataluña***	***Navarra***
Andalucía	*Rioja, La*	***Cantabria***	***Cantabria***	***Cantabria***	***Navarra***	*Rioja, La*
……………..	……………..	……………..	……………..	……………..	……………..	……………..
Rioja, La	***Galicia***	***Galicia***	***Andalucía***	***Galicia***	***Murcia***	***Galicia***
Asturias	***Extremadura***	***Murcia***	***Murcia***	***Murcia***	***CLM***	***Murcia***
CyL	***CLM***	**CyL**	**CyL**	***Andalucía***	***Galicia***	***CLM***
Extremadura	**CyL**	***CLM***	***CLM***	***CLM***	***Andalucía***	***Andalucía***
Galicia	***Murcia***	***Extremadura***	***Extremadura***	***Extremadura***	***Extremadura***	***Extremadura***

*Note: * In bold, regions that appear in at least three of the selected years. In italics, regions that appear before and after the Civil War. CyL stands for Castilla y León and CLM for Castilla La Mancha.*
Source: Table 4.

[24] The same table for the extremes in terms of provinces (NUTS-III) can be consulted in Table A.2 in the Appendix. Stability is also present, although to a lower degree, especially at the lower end of the distribution.

5. Description of the evidence in the long run.

a) The evolution of regional inequalities in the Spanish literature.

The lack of data for the period prior to 1955 continues to present problems. In 1986, Álvarez Llano estimated the distribution of the Spanish GDP by regions for the pre-statistical period[25], and although the methodology used was not made explicit, these data have served as the basis for further studies. Taking the figures provided by Álvarez Llano, Albert Carreras (1990) defined the regional patterns of economic development. Using the Inequality Index of GDP per capita, he analysed the evolution of regional inequality in Spain from a historical perspective. He criticized Álvarez Llano's high figures for Madrid in 1860, suggesting that the values for that year might be exaggerated[26]. With this in mind, Carreras states that the tendency towards regional inequality was constant from 1800, reaching a maximum around 1950 or 1960. From that moment onwards, the disparities reduced and showed an inverted U-shape evolution. By 1983, regional inequality was lower than at the starting date, almost two centuries before.

Later, Martín (1992) characterized the tendencies of regional economic development in Spain. Throughout the nineteenth century, a gradual widening of economic disparities among Spanish regions seems to have taken place as a result of the regional specialization process. Between 1900 and 1930, these patterns intensified and the growth in productive and sectoral specialization resulted in another widening in regional disparities, measured by the Gini Index of the GDP per capita. Domínguez (2002) analysed regional economic inequality in Spain over the last three centuries. Using the same data as those used in previous studies, Domínguez suggested that the evolution shown by the

[25] Álvarez Llano (1986).
[26] Carreras (1990), p.10 and 15.

Gini Index and the Coefficient of Variation of the GDP per capita in the second half of the nineteenth century could have led to a reduction in regional disparities, though the other evidence available does not support this view; indeed, other indicators such as the Williamson Index and the Industrial Intensity Coefficient of Variation led him to affirm that regional economic inequality rose between 1860 and 1900. This lack of consistency may have been caused by the unreliability of the figures before 1955[27]. The period between 1900 and 1930 was marked by a lessening in inequality that continued until 1960, with the lowest values for all indices being reached around 1970. Furthermore, Domínguez emphasizes that between 1800 and 1990 a continuous process of spatial concentration in production took place in a decreasing number of regions, corroborating German's (1996) idea of regional polarization in Spanish economic growth.

In a recent study, Rosés and Sánchez-Alonso (2004) build a new dataset of regional real wages for three different occupations (agrarian labourers, unskilled urban workers and urban industrial workers). They conclude that wages converged substantially from 1850 to 1914. Only in the aftermath of the WWI did wage differentials increase and during the 1920s real wage convergence across Spanish provinces returned.

b) Empirics: the new evidence.

In recent decades economic growth and convergence between countries has become an important topic in the literature. From the methodological point of view, most of the research carried out in this area has rested on the idea of the existence of β-convergence and σ-convergence[28]. As regards the first concept,

[27] According to Domínguez, this view is reinforced with the evolution of the Physical Quality of Life Index (PQLI). As we go back in time, the correspondence between this indicator and GDP per capita reduces. Domínguez (2002), pp. 70-80.
[28] Barro and Sala-i-Martín (1992).

there is an inverse relation between the growth rate and the initial income per capita, so for a set of economies the growth rate of the countries shows a tendency towards convergence; that is, the initially poorest countries will grow faster than the richest ones. Besides, the existence of σ-convergence implies a reduction of the income per capita dispersion over time for a sample of countries. If instead of countries the study focuses on regions in the same State, the convergence would take place at a faster pace, as they are more homogeneous units which have historically shared the same institutions and economic policy. A first approach to the measurement of the degree of σ-convergence is the evolution in the Coefficient of Variation (Table 4). A reduction in the coefficient over time would mean the existence of σ-convergence. In order to obtain a long term view helpful for the examination not only of the origin of regional inequality in income per capita but also of its persistence up to the present day, the analysis maintains the observations for the second half of the twentieth century up to 1995.

Between 1860 and 1900, the dispersion of income per capita increased and continued to do so until 1914. From 1914 onwards, this process was interrupted and the coefficient of variation began to fall. Therefore, Spanish regions converged to a certain extent until 1930. Nevertheless, this convergence was temporary; in the first years of the Franco regime the coefficient of variation remained almost stable, around 0.35, still above its initial 1860 value. Strong convergence was recorded from 1955 to 1975, as witnessed by the significant reduction in the coefficient. However, from that date onwards and over the last twenty years in this study the coefficient showed a tendency to stagnate[29].

[29] The coefficient shows the same evolution at a province level, NUTS-III.

Quah (1993, 1996) has suggested an alternative approach to the study of convergence between economies, based on the evolution of the distribution of income per capita on the whole, and known as *distribution dynamics*. Following Quah, we analyse the new evidence, first by plotting the kernel diagrams of the income per capita distribution. Kernel density diagrams allow an evaluation of the degree of convergence by studying the shape of the distribution at a specific point in time. From now on, and with a few exceptions in order to increase the number of observations, the analysis will include data for the 49 Spanish provinces (NUTS-III) between 1860 and 1995. Figures have been normalized on the Spanish GDP per capita (with the average taking a value of 1). Therefore, the kernel diagrams in Figure 1 describe the relative distribution of provinces around the sample average for the selected years[30].

In figure 1, 1860 is the clearest peak, showing a greater number of regions around the Spanish average. However there is a clear reduction between 1860 and 1900. In this analysis, convergence in the income is measured by the height of distribution: a flatter distribution suggests a greater dispersion from the average, reflecting an increase in regional inequality, or divergence. Therefore, there seems to have been a slight convergence between 1900 and 1930, although the process was later interrupted, since 1955 presents a minimum value. Convergence was continuous from that year onwards, though the distribution in 1995 still reached a maximum close to that of 1930. Another notable feature of the curves is that they moved to the left with respect to the initial year of 1860. This represents a greater density of provinces grouped around a value increasingly lower with regard to the average sample. This evolution does not begin to be corrected until 1975.

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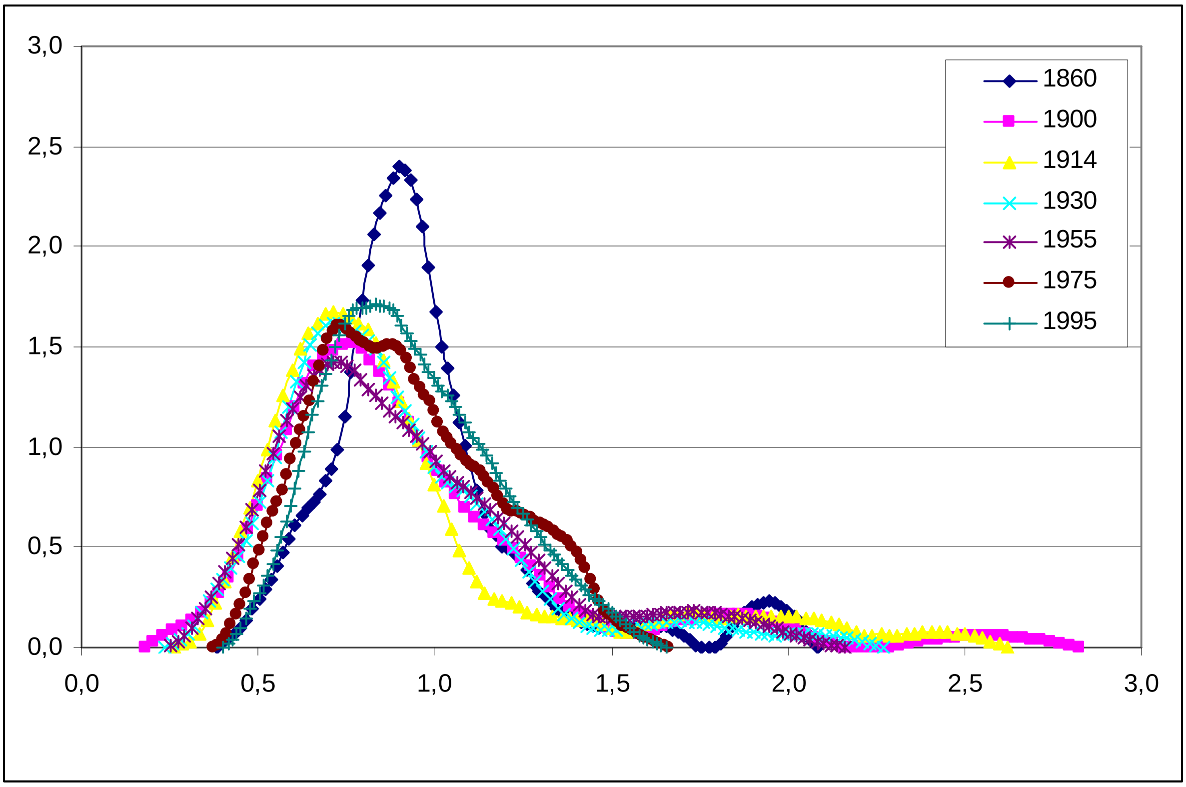
[30] I used the Epanechnikov Kernel with Silverman's optimal bandwidth. The distribution of the new estimates for 1860-1930 can be consulted in Figure B.1 in the Appendix.

Figure 1. Kernel densities (GDP per head in 49 Spanish provinces, 1860-1995).



Finally, in 1860 we observe a tendency in a group of regions to cluster around an income per capita level 1.8-2 times higher than the Spanish average, presenting a peak at the high end of the distribution. In 1900, two subgroups of regions appear clustering around 1.6-2 and 2.4-2.8 times the Spanish average; these two peaks are less pronounced. From that point on, the tendency starts to decrease and by 1975 no twin peaks are seen at the high end.

Nevertheless, the kernel diagrams give information on what the whole distribution looks like over different periods of time, but tells us nothing about the mobility within the distribution. If the aim is to analyse convergence between Spanish regions, we need to know if relatively rich or poor regions continued to be rich or poor over time. Therefore, the analysis of mobility is of great importance. In order to illustrate the intra-distribution movement, we define five income states (much below average, below average, average, above average, and much above average), in which income state 1 corresponds to the lowest income level and income state 5 to the highest[31].

A first step in the study of the mobility within the distribution is to assign the different economies to these five income states in the years selected, and then to count the changes in income states. Three historical periods are taken into consideration (1860-1900, 1900-1930, and 1955-1995). In order to simplify the analysis, we carry out the exercise for NUTS-II Spanish regions. Figure 2 shows the distribution of regions by income state in different years. The horizontal axis shows the income states, and the vertical axis indicates the number of economies included in each one. Further, the matrices show the movements of regions between income states for each pair of dates considered. These results can be interpreted as follows. In 1860 there were five regions in income state 4. By 1900, two regions had fallen into income state 3, and one had risen to income state 5. In addition, one region initially in income state 3 in 1860 had risen to income state 4 in 1900, and one region in income state 5 in 1860 moved to income state 4 in 1900, leaving four economies in income state 4 in 1900[32].

The results show that mobility was an important feature in all periods, particularly so during the period 1900-1930, when ten out of the seventeen Autonomous Communities moved from their initial income state. The mobility in the other two periods considered was almost equally pronounced and in both cases more than half of the regions transited to a different income state.

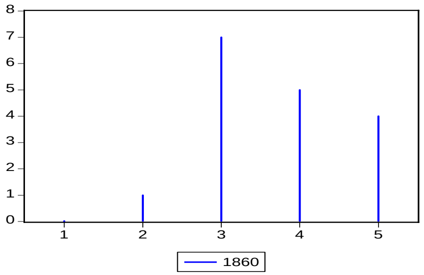
[31] The normalized observations are ranked from highest to lowest and split into five equally large income states, where each state contains the same number of regions. See Epstein et al. (2003), footnote 11, p. 84. The cell partition is derived by Quah's TSRF program.

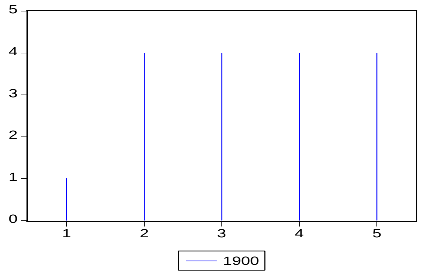
[32] The regions that experienced these changes in income state are shown in Table A.3 in the Appendix.

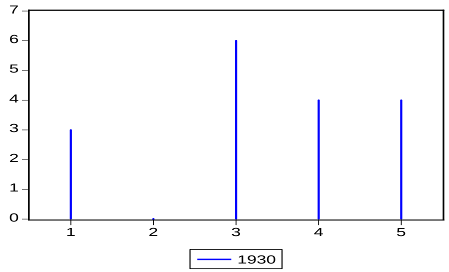
Moreover, movements of more than one income state can be observed in all periods. Between 1860 and 1900, the only economy which experienced such movements fell to a lower income level; between 1900 and 1930, two rises were recorded; and between 1955 and 1995 two out of the three regions that moved more than one income state ended up in a higher income state.

In 1860-1900, mobility was also concentrated in middle income states, since five out of the nine transitions took place in income state 3, which would be a sign of divergence. Between 1900 and 1930 only two out of the ten movements occurred in the average income state. On the other hand, four transitions ended up in the average income state. Over the last period, the starting situation had reversed; there were no movements in income state 3 and transitions were concentrated at the higher and lower ends. Moreover, five transitions ended up in income state 3 during this period. This shows the existence of convergence forces.

Figure 2. Empirical distribution and mobility by income state for 17 Spanish regions, NUTS-II, 1860-1995.





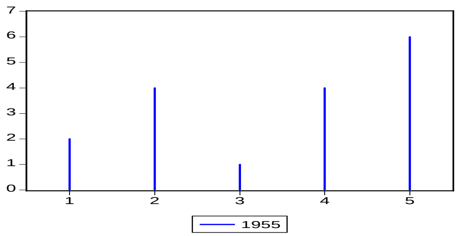


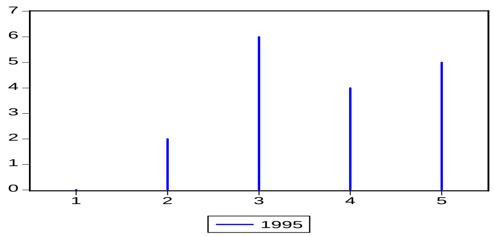
Number of moves between income states, 1860 to 1900.

	1	2	3	4	5
1					
2					
3	1	3		1	
4			2		1
5				1	

Number of moves between income states, 1900 to 1930

	1	2	3	4	5
1			1		
2	3		1		
3				1	1
4			2		
5				1	





Number of moves between income states, 1955 to 1995.

	1	2	3	4	5
1		1	1		
2			2	1	
3					
4			1		1
5			1	1	

Finally, the probability of falling into a lower income state seems to have been higher in the initial stages of economic development. Between 1860 and 1900, seven out of nine transitions ended up in an inferior income state, but between 1900 and 1930, the probability of falling into a lower income state was more similar to that of rising to a higher income state. Between 1955 and 1975, two thirds of transitions were to a higher income state and only one third were to a lower one. In this case, increases were concentrated in the lowest income regions, whereas the falls in income states were experienced by higher income regions, emphasizing the idea of convergence over this period.

However, this first empirical approach to the mobility within the distribution is purely descriptive and has to be considered with care. From now on, following Quah's suggestion, a more formal approach is proposed through the distribution dynamics and transition probability matrices. In order to use all the information available, the analysis is again based on the 49 Spanish provinces[33]. Starting from the five income states defined above, we first derive the transition probability matrix, which shows the average probability of provinces to move from an income state to another. The aim is to test the existence of mobility within the distribution. Second, the matrix obtained may, through continuous iteration, result in a long term equilibrium where a further iteration would not have any effect. This is known as the ergodic distribution, which shows the shape of the distribution in the long run. In order to calculate the transition probability matrices and the ergodic distribution, we use the Time Series Random Field (TSRF) econometric shell developed by Quah.

[33] The study includes six years. In order to homogenize the periods and analyse transitions in income states, the observation for 1914 has been excluded. Nevertheless, the time span of the periods is not the same over time and therefore the likelihood of a region making a transition is larger between 1860 and 1900 than it is between 1955 and 1975. Of course, the same yearly space between the cross sections would be the desirable situation. However, the time span of transitions is restricted to the availability of the data. A total of 294 observations were made.

The vertical axis illustrates the initial income states of the provinces, whilst the rows of the matrix show the probability that, on average, an economy in an income state will move to another income state over time. Thus, each of the rows in the matrix will add up to 1. Two main features should be considered when dealing with the matrix: persistence and mobility. Persistence is given by the elements on the diagonal of the matrix, reflecting the probability that a province in an income state remains in the same income state over time.

According to Table 6, the degree of persistence is higher at both the higher end (75%) and the lower end (58%) than in middle income states[34]. Further, in both cases, the probability of remaining in the initial income state is higher than that of moving to a different one. In contrast, intermediate income states 2, 3 and 4 show a lower degree of persistence, and thus, greater mobility[35].

When analysing mobility, stress should be placed on the values outside the diagonal, which give us the probability that an economy in an initial income state will change to a different income state over time. In this case, the upper triangle represents the probability of mobility towards higher income states, and the lower triangle, the transitions towards lower income states. As we have seen, the probability of being much above average income is higher than that of being much below average income on the diagonal. However, the probability of a top-ranked province falling behind (19%) is lower than the probability of a province much below average income rising (34%). Thus, it is easier to leave income

[34] Since the periods considered are quite large and thus the probability of transition between income states is higher, it is possible to assert, according to the values reached in the extremes of the matrix diagonal, that persistency seems to be important.

[35] Although the probability of remaining in income state 4 (56%) is very similar to that of remaining in income state 1 (58%).

state 1 than to leave income state 5. Further, there exists the possibility of an economy initially in income state 1 ending up in income state 4 (2%).

From state 2, a representative economy is more likely to go up to income state 3 (28%) than to fall (24%). It could even go ahead to income state 4 (6%). A province in income state 3 is more likely to move up an income state (26%) than to move down a state (15%). This pattern also applies for a province in income state 4 (21% and 15%), although the possibility of going back three income states also exists (2%). In general, for middle income categories, the probability of falling into a lower income state is always lower than that of moving to a higher income state.

Table 6. Transition probability matrix (GDP per head relative to Spanish average).

	1	2	3	4	5
1	0,58	0,34	0,06	0,02	0,00
2	0,24	0,42	0,28	0,06	0,00
3	0,07	0,15	0,48	0,26	0,04
4	0,02	0,06	0,15	0,56	0,21
5	0,00	0,00	0,06	0,19	0,75
Ergodic Distribution:	0,137	0,161	0,202	0,254	0,247
1860:	0,102	0,082	0,347	0,286	0,184

The next stage in the analysis is to derive the ergodic distribution through continuous iteration of the transition probability matrix until the steady state is reached. Therefore, the dynamics inherent to the system can be studied and conclusions about the existence of convergence in the long term may be reached. The ergodic distribution shows what the map of Spain would look like if the probabilities of transition of the provinces remained unchanged in time:

the ergodic distribution reports the equilibrium proportion of economies falling in each of the five relative income states.

The existence of convergence in the long run would require an ergodic distribution where the provinces were mainly located around income state 3, defined as the average income state. On the other hand, if the distribution tended to be flat among all income states, this would be a sign of divergence. Nevertheless, here, the results show that, in the long run equilibrium, as we rise in the income scale from 1 to 5, the proportion of provinces in the higher income states increases, with income state 4 including the greater number of provinces[36]. A distribution of this type does not reflect convergence. Further, two different plateaux can be observed: first, for the lower income states, where 50% of the provinces are found in income states 1, 2 and 3 in the long run, and second, for the provinces in higher income states, with the remaining half of the provinces distributed in income states 4 and 5.

6. Concluding remarks.

The recent study by Geary and Stark (2002) has established a methodology for estimating regional GDP which can be applied to other economies such as the Spanish economy. In the case of Spain, this application is of particular interest due to the inexistence of reliable data for the territorial distribution of GDP before 1955.

After explaining the process and the treatment of the sources used, we tested the robustness of certain implicit assumptions regarding Geary and

[36] Although the transition probability description suggests incomes tending towards extremes at both high and low endpoints.

Stark's methodology. In particular, we tested the assumption that sector service wages are proxied by a weighted average of agriculture and industry series, finding that it does not greatly distort the estimates.

Likewise, the new series are analysed by comparing them to other available estimates, such as those in Álvarez Llano (1986) and Alcaide (2003). From the comparison, certain constants can be inferred which show that the results in the present paper differ from those previously obtained.

Using the new estimates, a series of descriptive exercises are proposed for an analysis of the historical dynamics of the geographical distribution of income and the existence of convergence in the long run. Quah's work is the reference. Looking at the shape of the kernel distribution, an increase in regional inequality is observed between 1860 and 1900 which is much flatter in the later year. The empirical analysis of the distribution also shows a certain mobility over this period. This mobility mainly affected the middle income regions with a clear tendency to fall to a lower income state.

Between 1900 and 1930, the kernel diagrams reveal the existence of two subperiods, divided by the corresponding observation for 1914. Up to 1914, the distribution increases in height and so we can speak of convergence. However, in 1930, the distribution is slightly lower, revealing stagnation in the process of convergence. This is the period of highest mobility within the distribution, as well as a period with a lower number of transitions in the average income state than in the previous years. Downward mobility is still important.

The evolution of kernel density distribution suggests a tendency towards convergence in the period from 1955 to 1995. This is also a period with a certain mobility, although in this case, mobility is centred in the higher and lower extremes of the sample. Two thirds of the transitions tend to occur towards higher income states, and concentrate in the lower income provinces. Downward mobility is important in the higher income states, reinforcing the view of a convergence period.

The transition probability matrices show a greater persistence in the extremes of the distribution. Thus, richer provinces remained rich and the poorer tended to remain poor, although the probability of leaving income state 1 was higher than the probability of leaving income state 5. In the middle incomes, mobility was more important, though the probability of falling to a lower income was always lower than the probability of rising to a higher income state. As regards the ergodic distribution, the long run tendency shows that half of the provinces would be found in the two higher income states. The remaining half would be distributed between the much below average (13.7%), below average (16.1%) and average income states (20.2%). This situation does not reflect convergence in the long run.

To conclude, one point should be stressed. The main contribution of this paper is the presentation of new regional and provincial GDP data set for Spain between 1860 and 1930 following Geary and Stark (2002). Recently, Crafts (2005) has suggested a way of refining this methodology by including non-wage income in the estimation using the regional distribution of income tax. The next step forward in the research is to improve the new estimates along the lines that Crafts suggests.

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Appendix

Table A.1.

1913=100	Service sector wages, Madrid		
	Reher and Ballesteros	New	(pts./day)
1900	78.68	77.29	
1914	100.55	100.00	2.94
1930	209.18	248.50	6.12

Madrid Service sector wage estimate = 7.32		Madrid Service sector wage corrected = 6.12	
GDP 1930 (mil. pts.)	%	GDP 1930 (mil. pts.)	**%**
3,443	10.19	3,084	9.12

GDP per capita, 1930 Madrid, service sector wage corrected = 6.12		GDP per capita,1930 Madrid, service sector wage estimate = 7.32	
Cataluña	**172**	Madrid	**173**
Madrid	**155**	Cataluña	**170**
País Vasco	**151**	País Vasco	**149**
Asturias	**125**	Asturias	**123**
Cantabria	**113**	Cantabria	**112**
Navarra	**109**	Navarra	**108**
Aragón	**104**	Aragón	**103**
Baleares	**104**	Baleares	**103**
C. Valenciana	**91**	C. Valenciana	**90**
Rioja, La	**86**	Rioja, La	**85**
Galicia	**84**	Galicia	**83**
Canarias	**82**	Canarias	**81**
Andalucía	**81**	Andalucía	**80**
Murcia	**80**	Murcia	**79**
Castilla y León	**67**	Castilla y León	**67**
Castilla La Mancha	**65**	Castilla La Mancha	**64**
Extremadura	**60**	Extremadura	**59**
Spain	**100**	**Spain**	**100**

Table A.2. Provinces with the highest and lowest GDP per capita.*

1860	1900	1914	1930	1955	1975	1995
Barcelona	***Barcelona***	***Barcelona***	***Barcelona***	***Vizcaya***	**Álava**	***Gerona***
Madrid	***Guipúzcoa***	***Guipúzcoa***	***Madrid***	***Barcelona***	***Guipúzcoa***	Baleares
Cádiz	***Vizcaya***	***Madrid***	***Vizcaya***	***Guipúzcoa***	***Madrid***	***Madrid***
Vizcaya	***Madrid***	Cádiz	***Guipúzcoa***	***Madrid***	Tarragona	**Álava**
Navarra	***Gerona***	***Gerona***	Zaragoza	**Álava**	Baleares	Tarragona
…………….	…………….	…………….	…………….	…………….	…………….	…………….
Cáceres	Lugo	Teruel	***Cáceres***	Orense	***Cáceres***	Córdoba
Pontevedra	Murcia	Granada	***Granada***	***Cáceres***	**Jaén**	Cádiz
Zamora	Ávila	Soria	Cuenca	**Jaén**	Orense	**Jaén**
León	***Cáceres***	**Zamora**	**Zamora**	***Granada***	***Granada***	***Granada***
Lugo	León	***Cáceres***	Salamanca	Almería	Badajoz	Badajoz

*Note: * In bold, regions that appear in at least three of the selected years. In italics, regions that appear before and after the Civil War. CyL stands for Castilla y León and CLM for Castilla La Mancha.*
Source: Table 4.

Figure B.1. Kernel densities (GDP per head in 49 Spanish provinces, 1860-1930).

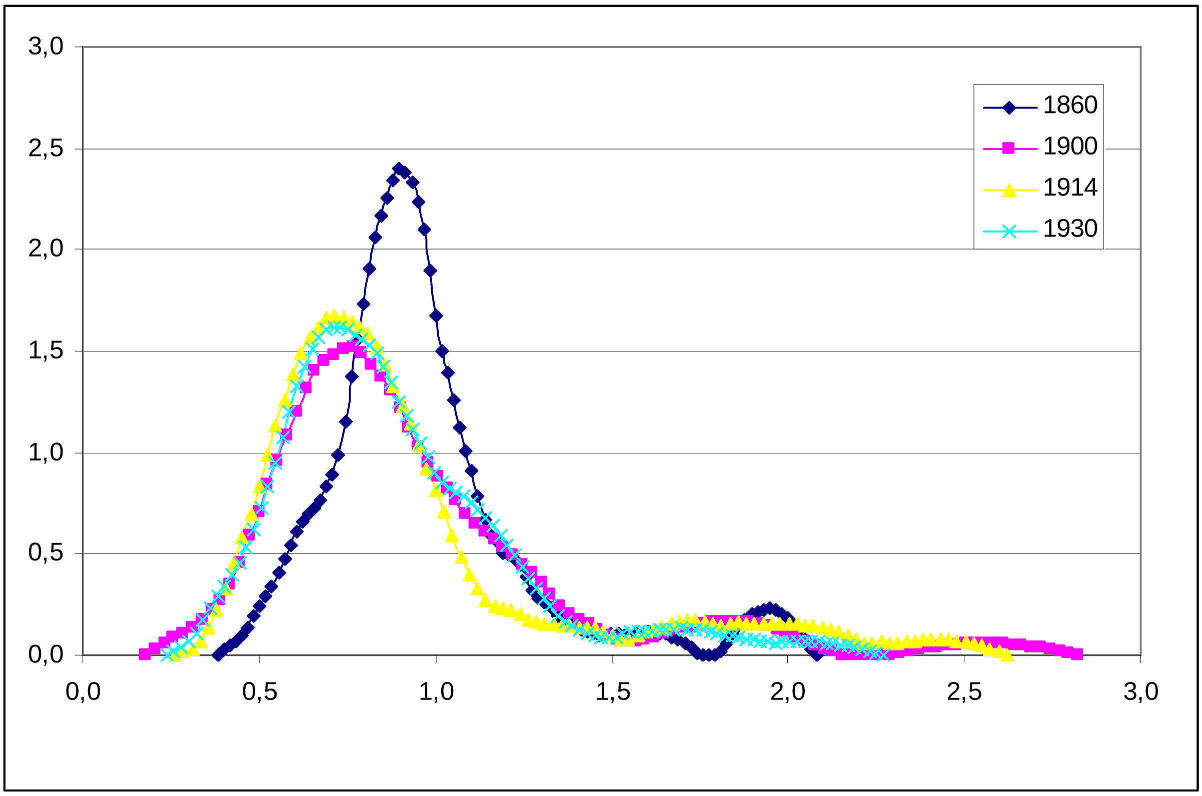

Table A.3. Changes in income states, Spanish regions.

	1860	1900	1860-1900	1900	1930	1900-1930	1955	1995	1955-1995
Andalucía	1.09 (4)	0.86 (3)	-1	0.86 (3)	0.80 (3)		0.68 (3)	0.68 (2)	
Aragón	0.97 (4)	0.92 (4)		0.92 (4)	1.03 (4)		0.98 (4)	1.08 (4)	
Asturias	0.82 (3)	0.89 (3)		0.89 (3)	1.23 (5)	+2	1.11 (4)	0.87 (3)	-1
Baleares	0.94 (4)	0.83 (3)	-1	0.83 (3)	1.03 (4)	+1	1.21 (5)	1.40 (5)	
Canarias	0.87 (3)	0.84 (3)		0.84 (3)	0.81 (3)		0.75 (2)	1.01 (4)	+2
Cantabria	1.02 (4)	1.25 (5)	+1	1.25 (5)	1.12 (4)	-1	1.15 (5)	0.90 (3)	-2
Castilla La Mancha	0.89 (3)	0.70 (2)	-1	0.70 (2)	0.64 (1)	-1	0.66 (1)	0.80 (3)	+2
Castilla y León	0.80 (3)	0.69 (2)	-1	0.69 (2)	0.67 (1)	-1	0.83 (3)	0.89 (3)	
Cataluña	1.37 (5)	1.90 (5)		1.90 (5)	1.70 (5)		1.59 (5)	1.24 (5)	
C. Valenciana	0.96 (4)	0.93 (4)		0.93 (4)	0.90 (3)	-1	1.12 (4)	1.01 (4)	
Extremadura	0.79 (3)	0.76 (2)	-1	0.76 (2)	0.59 (1)	-1	0.56 (1)	0.68 (2)	+1
Galicia	0.69 (2)	0.77 (2)		0.77 (2)	0.83 (3)	+1	0.70 (2)	0.83 (3)	+1
Madrid	1.93 (5)	1.79 (5)		1.79 (5)	1.73 (5)		1.55 (5)	1.36 (5)	
Murcia	0.87 (3)	0.57 (1)	-2	0.57 (1)	0.79 (3)	+2	0.69 (2)	0.82 (3)	+1
Navarra	1.28 (5)	0.96 (4)	-1	0.96 (4)	1.08 (4)		1.15 (5)	1.21 (5)	
País Vasco	1.25 (5)	1.77 (5)		1.77 (5)	1.49 (5)		1.77 (5)	1.10 (4)	-1
Rioja, La	0.84 (3)	1.01 (4)	+1	1.01 (4)	0.85 (3)	-1	1.09 (4)	1.18 (5)	+1
Total Trans.			9			10			9
Simple Trans.*			**6**+*2*			**6**+*2*			**2**+*4*
Double Trans.*			**1**+*0*			**0**+*2*			**1**+*2*

*Note: * In bold, downward mobility; in italics, upward mobility.*