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Daniel A. Tirado, Joan R. Rosés and Julio Martínez-Galarraga

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This paper studies the evolution of Spanish regional inequality from 1860 to 2000. The results point to the coexistence of two basic forces behind changes in regional economic inequality: differences in economic structure and labor productivity across regions. In the Spanish case, the initial expansion of industrialization during the period 1860-1900, in a context of growing economic integration of regions, promoted the spatial concentration of manufacturing in certain regions, which also benefited from the greatest advances in terms of labor productivity. Since 1900 and until 1985, the diffusion of manufacturing and services production to a greater number of locations generated the emulation of production structures and a process of catching-up in labor productivity and wages. So, in these first 125 years, national market integration and economic growth has been followed by a U-shaped evolution of regional incomes inequality. Nevertheless, some productivity differentials remained and, from 1985 on, the Spanish entry in the UE generated a new upsurge of divergence in productivity across Spanish regions that could be in the base of a new phase of regional income divergence.
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The Long-Term Patterns of Regional Income Inequality in Spain (1860-2000)

1. Introduction

Regional income inequality shows a persistent pattern in apparently well integrated economies such as European Union. As pointed out by Puga (2002), nearly a quarter of European citizens live in regions with a pc GDP below 75% European average. That is to say, despite sizeable intervention through Structural Funds, regional inequalities in Europe seem to have not narrowed substantially. In fact, although income differences across Member States have fallen since mid 1980s, inequalities between regions within each Member State have persisted. So, albeit a great amount of resources have been devoted to reduce this divergence, regional inequality is still a matter of concern for European policy-makers.

From a theoretical point of view, international and regional economics have explained income disparities on the basis of differences between regions in their endowments of natural resources, factors of production, infrastructure, or technology. In this context, the removal of obstacles to the movement of goods and/or factors would by itself cause convergence of factor returns and living standards. However, as it has been posed by New Economic Geography literature (henceforth, NEG) there are relevant forces missing from the traditional analysis, which can affect regional disparities -even without large differences in underlying characteristics- and prevent convergence. NEG theoretical models suggest that the interaction between transport costs, increasing returns and size of market under a monopolistic competition framework can lead to spatial agglomeration of economic activity (Krugman, 1991). In this context, firms produce more efficiently and workers enjoy higher welfare by being close to large markets, and that large markets are in turn those where more firms and workers locate. This creates a cumulative causation process that tended to increase income differences along the process of integration of economies in a single market. Besides, in this vein, studies like Puga (1999) show that the relationship between the process of regional integration and the degree of concentration of economic activity could describe a bell-shaped non-monotonic evolution. That is to say, when transport (transaction) costs are high industry would be disperse across the space. When transport costs are intermediate, centripetal forces intensify agglomeration when workers are mobile. For low transport (transaction costs), a new tendency towards dispersion can emerge. Congestion costs could act as a centrifugal force favoring the dispersion of economic activity. Therefore, progressive market integration can eventually lead, as traditional models predict, to income convergence.

Growth theory also offers insights about the causes of regional inequality. In the textbook Solow model, in a closed economy context, differences in capital per worker led to slow income convergence across locations (Barro and Sala-i-Martin, 2003). If we add to the model cross-regional movements of capital, convergence rates may increase due to the fact that capital moves from capital-abundant to capital-scarce regions following differences in its relative remuneration (Barro *et al* 1995). Nevertheless, the new strand of growth theory, the endogenous growth theory, also makes contradictory predictions about the impact of cross-regional integration. In the presence of increasing returns, the basic model (Romer, 1986) predicts that increasing movements of capital will lead to regional divergence. Instead, if we consider that technology is not a public good and, hence, subject to decision-making

processes of individual agents and their prospect for monopoly rents, an increased scale of the economy will have a lasting positive effect on growth.

So, albeit theoretical basis for the analysis of the determinants of differences in economic growth across territories are well established, more empirical work needs to be done. In this respect, the empirical analysis of the evolution and determinants of regional income inequality in the long lasting experiences of growth and integration of national economies could be of great help. The reason is that this kind of approach would offer evidence on the determinants of regional growth both, in periods characterized by growing inequality across regions and in those in which income converge could have dominated the stage.

In this respect, an old economic history tradition has also posed that economic growth in the context of integration of different regions could led to the initial increase in regional per capita income inequalities. The fundamental reasons could be related to the specialization and structural change processes associated to growth and economic integration. Williamson (1965) described this fact considering the evolution of incomes in a cross section of countries an analyzing the long term evolution of regional inequality in the US. He posed first the hypothesis that regional inequality could have followed an inverted U-pattern along the process of growth of national economies, with growing inequality during the XIXth century and convergence from then on. He concluded that, in the case of the US, structural change and specialization could have favored increasing inequality in the first stages of economic growth, but the advance in the process of structural change and integration, with associated increases in capital movements and internal migrations, would help to explain the long term reduction in income inequalities across the States. Kim (1998) also analyzed extensively the evolution of regional inequality across the United States in the long term and stated the existence of an inverted U shape evolution. Besides, he pointed out that specialization and divergence in economic structures would be in the base of the increasing segment of this curve during the second half of the XIXth century. During the XXth century, further progress in the process of growth and national market integration was accompanied by the reduction of regional income inequality. The homogenization of economic structures and convergence in productivity across the States may have had the central role in the process. Caselli and Coleman (2001) went a step forward in the study of the determinants of long term regional inequality in the US and related the convergence among regions within the US to the reduction of agricultural employment in the poorest locations.

Recently, Combes *et al.* (2008) have studied the long term evolution of economic disparities across French regions. These authors conclude that the spatial distribution of manufacturing and services have traced a U inverted curve since the mid-nineteenth century. In this case, they pointed out that the existence of agglomeration economies would be a relevant factor for the understanding of regional incomes evolution in France from 1860 to 1930. From them on differences in regional human capital stocks would be the main factor in explaining regional income growth differences, in a context of global income inequality reductions. In short, each one of these papers finds out the existence of a long term U inverted shaped relationship between national economic growth, market integration and regional inequality and stress the role played by different mechanisms in explaining this behaviour in national experiences such as the United States or France.

As regards the case of Spain, the evolution of regional inequality is well documented since 1955 when the *Banco Bilbao Vizcaya* (BBV) first published the series of regional income. This information has been used in a good number of studies focused on the analysis of regional economic growth following the influential work of Barro and Sala-i-Martin (1991). The results point out the existence of convergence (both β y σ) since 1955 until the end of the 1970s. However, in the 1980s the process of convergence came to a halt and in the last decades there is no evidence of further regional convergence in Spain.[1]

Before 1955, data concerning the geographical distribution of GDP is scarce and therefore, the study of regional inequality in the long run has been particularly difficult. For the XIXth century and the first decades of the XXth century the only available data on regional income come from Álvarez Llano (1986). Nevertheless, this author does not provide information on the methodology employed in the estimation and thus, the reliability of the figures has been seriously questioned.[2] In addition, for the period between 1930 and 1955, data on regional GDP has been provided by Alcaide (2003). Taking the figures offered by Álvarez Llano, Carreras (1990) carried out a first exercise to analyse the evolution of regional inequality in Spain from a historical perspective. Carreras found a constant tendency towards the increase of regional inequality since 1800, reaching a maximum around 1950 or 1960. From that moment onwards, regional disparities began to decrease showing an inverted U shape evolution in the long run. As a consequence, by 1983, regional inequality was lower that at the starting date, almost two centuries before.[3] Nevertheless, the new estimation of regional per capita incomes for the period 1860-1930 offered in this article challenges this view and points to the beginning of the XXth as the starting point of the process of regional convergence in Spain.

In short, this article proposes that the empirical study of regional economic inequality across regions in Spain, a country with a long lasting economic growth and market integration experience, could helps us to disentangle what the main mechanisms at work are. Analyzing the long term Spanish experience of integration and economic growth from this point of view could be especially interesting because first, in Spain more than 150 years of internal economic and political integration have not been followed by the disapearence of pc GDP differences across regions. Second, it could help us to ascertain if the relative importance of factors determining the existence of different regional growth paths have changed along the period analyzed. That is to say, along the different phases of Spanish economic growth, and probably in phases both of amplification and reduction of regional income inequalities. And third, this long term analysis consents us to analyze the evolution of regional inequalities along two coexisting different processes of economic integration: one internal, starting in the middle of the XIXth century, and one external that, in the Spanish case, after a failed starting point in the second half of the XIXth century, was resumed in the middle of the XXth century and accelerated from the Spanish adhesion to the EU in 1986 on.

The remainder of the paper is structured as follows. First, we offer a brief summary of the historical process of growth and market integration of the Spanish economy. Second, we will present new evidence on regional inequality patterns in the long term. For doing that, we will present new historical estimations of per worker GDP for NUTS II Spanish regions for

[1] Mas et al. (1994), De la Fuente (1996).

[2] The years considered by Álvarez Llano (1986) were 1802, 1849, 1860, 1901, 1921 and 1930. For a critical evaluation of these data, see Carreras (1990).

[3] This evolution can be completed with Martín (1996) and Domínguez (2002). As in Carreras (1990), the analyses are both based on the GDP estimates by Álvarez Llano (1986).

the period between 1860 and 1930 and will link it to well known data corresponding to the period 1930-2000 (Alcaide, 2003, BBV 1999 and FUNCAS 2004). Besides, we present the main stylized facts on the evolution of Spanish per worker regional GDP. Section 4 decomposes the determinants of regional variation in per worker GDP and Section 5 presents the conclusions.

2.- Long term market integration and economic growth of Spanish economy

Spanish modern economic growth process started during the second third of the XIXth century. From then on, and perhaps with the exception of the years 1930-1952, that is to say the years of the Spanish Civil War and its aftermath, Spanish per capita GDP experienced positive and sustained growth rates. Besides, following the analysis carried out by Prados de la Escosura (2005) and Prados de la Escosura and Roses (2009), it registered significant accelerations during some historical lapses such as the periods 1921-29, 1953-58, 1959-1974 or 1987-2000.

Table 1
Average logarithmic pc GDP growth rates (1850-2000)

1850-1883	**1.4**
1884-1920	**0.7**
1921-1929	**2.8**
1930-1952	**0.0**
1953-1958	**3.9**
1959-1974	**5.8**
1975-1986	**1.8**
1987-2000	**3.3**

Source.- Prados de la Escosura and Roses (2009)

This process of economic growth was enhanced initially by the adoption of well known innovations in industrial production, the advance in the structural change process and the progress in the integration of national markets for good and factors of production and also into the growingly globalized Atlantic economy.

In particular, and from a long term perspective, Spanish internal market integration received a strong impulse in the middle of the XIXth century. In fact, before mid-nineteenth century, Spanish regions were relatively independent regional economies. The presence of barriers to interregional trade and the movement of capital and labor were ubiquitous: local tariffs and regulations on domestic commerce were widespread; weights and measures differed across regions; transport costs were very high due to the particular geography of Spain, which avoided an extensive water transport system, and the low public investment in transport infrastructures; economic information moved slowly across regions; banking system was underdeveloped; and many regions had their own currencies (although all currencies were based on a bi-metallic monetary system). As a consequence, Spanish commodity regional markets were scarcely integrated, albeit certain interdependence in commodity prices

existed since the eighteenth century,[4] and prices of production factors differed markedly from one region to another.

Both market liberalization and transport improvements, particularly the completion of Spain's railways network, induced the creation of a national market for most important commodities during the second half of the nineteenth century. The successive political reforms of the nineteenth-century gave legal backup to property rights, eliminated tariffs and local restrictions on home commerce and assured the free mobility of people and capital. [5]

Nevertheless, the integration of the Spanish economy into the Global Atlantic economy did not follow a similar pattern. Although the liberal reforms established in the middle of the XIXth century supposed the end of main prohibitions on foreign trade and favored the free movement of capitals and labor across Spanish foreign borders, Spanish foreign trade policy took a protectionist drive from the end of the 1880s. This protectionist turn and the renounce of Spain to participate in the international monetary system driven by the gold standard prevented that Spain took advantage of the convergence effects generated in the Atlantic economy during the first wave of globalization in the XIXth century (O'Rourke and Williamson, 2001).

The Spanish Civil War and the first years of Francoist regime put a break on the Spanish growth process and on the advance of economic integration of national market. Regulation of markets for goods and factors throughout government control of prices and quantities in final goods, intermediates, energy, capital markets and labour market rewards determined the absence of incentives for mobility of factors and resources creating a false image of prices convergence without a significant increase in quantities movements across regions. Capital did not flow in the same intensity across regions, internal workers movements live a halt after its big first expansion in the 1920s (Silvestre, 2003). Besides, the absence of sounded programs of investment in infrastructure did not collaborate in the reduction of transport costs during the 1940s and the first years of the 1950s.

As far as the integration of the Spanish economy in the international markets for goods and factors of production is concerned, the Francoist regime adoption of an autharquic policy implied the total isolation of Spanish economy from the international market influences. Foreign trade and international capital movements registered during these years their least levels in Modern Spanish Economic History.

The economic liberalisation and stabilisation measures introduced at the end of the 1950s favoured the transition of the Spanish economy towards a new phase in its long-term economic development. This period was characterised, among other elements, by high aggregate growth rates of production and by the lead taken by the industrial sector in the country's economic activity. Linked to this, Spanish economic growth in the 1960s was also typified by the advances made in the construction industry and the services sector, stimulated by the growing mobility of the work force that was becoming increasingly concentrated in the big cities. New investments on infrastructures such as roads, railways, communication and energy supply and distribution favoured further reductions in internal transport cost during these years.

[4] See, for example, Ringrose (1996).
[5] A detailed analysis of this process in Martinez-Galarraga, Roses and Tirado (2009).

These liberalizing policies also affected the Spanish integration into the international economy. Although at a slow pace, Spain started to recover its position in the international markets. The Spanish adhesion to some international organisms such as GATT, World Bank or IMF and the liberal winds that also arrived to the regulation of international commodity and capital movements marked the starting point for a new wave of growth of international movements of goods, capital and labor across Spanish borders. Nevertheless, the level of integration reached by the Spanish markets for goods and capitals during this period cannot be considered as that corresponding to a truly open economy.

The crisis of the seventies, which in the case of Spain stretched well into the eighties, put a brake on these upward trends, and high average growth rates of GDP were not recorded again until the final years of the XXth century (1985-2000). This new phase in Spanish economic growth was no longer linked to the leadership of industrial production, but rather to that of the services and construction sectors. In respect of the evolution of the transaction costs, during these years, a new wave of investment in the infrastructures helped to reduce further the transport cost across Spanish regions and also across national borders. Huge investment programs in freeways, high-speed railway system and telecommunications were developed during these years and favoured major advances both in the integration of internal Spanish market and also in the integration of Spain into the international markets. In this respect, the adhesion of Spain to the EU in 1986 acted as a big institutional reform that probably changed the framework in which specialization of Spanish regions took place.

Given these conditions, we now need to analyse whether the evidence concerning the evolution in the regional inequality patterns in Spain has followed a long-term profile that fell in line with the changes experienced by the process of growth and internal and external market integration. Here, it should be recalled that, in broad terms, the increasing integration of the Spanish internal market could have favoured both the initial appearance of a process of geographical agglomeration of activity and divergence in regional pc GDP levels and the subsequent opening up of a process of convergence once the transport costs and the development level was great enough. In other words, the long term regional inequality could have described an inverted U-shaped curve during the process of integration and growth of the Spanish economy. Notwithstanding, the impulse received in the last years in the integration of the Spanish economy in the international markets could have had effects in the patterns of growth and specialization of Spanish regions and so it could have affected the long term evolution of regional income inequality.

3. Long term patterns of regional income inequality: new data and stylized facts

For analyzing the long term evolution and determinants of regional inequality in Spain it has been needed to estimate or collect data on Gross Added Value by sectors and regions and on regional employment by sectors for the years 1860-2000. As far as estimates of regional GDP for Spanish regions for the years before the Spanish Civil War do not exist (or are not enough reliable), we have estimated new figures for several years along the period 1860-1930. In particular, the availability of sources consents us to estimate these figures for the years 1860, 1900, 1910, 1920 and 1930. From 1930 on, the data have been collected from different well known sources such as Alcaide (2003) for the years 1930-1950, BBV (1999) for the years 1955-1995 and FUNCAS (2004) for the year 2000. As far as these sources are well known and extensively described and used by Spanish economists, we dedicate the next

paragraphs to show the procedure and the sources we have used to produce a new set of estimates of regional per capita GDP in Spain for the period 1860-1930.

In this respect, our estimation of Spanish per worker regional GDP is mainly based on the methodology developed by Geary and Stark (2002). This departs from the basic principle that the national per capita GDP is equal to the sum of all regions' per capita GDPs. Algebraically, the total GDP of the Spanish economy is the sum of all regional GDPs:

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

However, given that provincial GDP (Y_i) is not already available, this will be proxied according to the following equation:

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

y_{ij} being the output, or the average added value, per worker in each region *i*, in sector *j*, and L_{ij} the number of workers in each region 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 regional labor productivity in each sector is reflected by its wage relative to the Spanish average (w_{ij}/w_j). In consequence, we can assume that the regional GDP will be given by:

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

where, as suggested by Geary and Stark (2002), w_{ij} is the wage paid in region *i* in sector *j*, w_j is the Spanish wage in each sector *j*, and β_j is a scalar that preserves the relative region differences but scales the absolute values so that the regional total for each sector adds up to the Spanish totals.[6] So, in the absence of output figures, Geary and Stark (2002) set a model of indirect estimation based on wage income, which allows for an estimation of GDP by region at factor cost, in current values. The basic data involved in this estimation procedure are national output per worker by sector, and nominal wages and active population, by sector and region. However, in several industries (see below), we had not to resort to indirect estimates given direct estimates of regional output had been computed. It should be noted that this methodology also allows us to compute not only regional GDPs but also figures for the different industries. Geary and Stark (2002) distributed regional GDPs in three different industries (agriculture, manufacturing and services) but, instead, we have considered up to five sectors (agriculture, mining, manufacturing, construction and services) for Spain given the availability of data.[7]

Agriculture

In agriculture, we were able to compute direct production estimates (nominal gross value added) for 1900, 1910, 1920 and 1930. More specifically, the quantities of production of different agrarian products collected by GEHR (1991) were multiplied by the relative

[6] Spanish GDP was taken from Prados de la Escosura (2003).

[7] However, to simplify our further discussion, we will aggregate mining, manufacturing and construction to generate industrial sector value added.

prices and the transforming coefficients calculated from the data provided by Simpson (1994). Then, these real values were converted into nominal values using the disaggregated agrarian prices provided by Prados de la Escosura (2003). Finally, we have scaled the absolute values so that the provincial total for each sector adds up to the Spanish totals for agricultural value from Prados de la Escosura (2003).

For the year 1860, we have employed a modified version of Geary-Stark's method. A major problem with agricultural estimations is that we know the daily wages but not the amount of working days over the year and the amount of female workforce in agriculture. Moreover, it is likely that these factors varied widely across regions. For this reason, we have modified the initial estimation based on the original method with a scalar computed by dividing our direct estimation for 1910 by that obtained with Geary-Stark's method.[8] In consequence, we assume that the amount of days worked and the relative amount of women working in each province remained constant between 1860 and 1910.

Mining

The provincial mining production was calculated from information on the production values disaggregated by province, which were drawn from the Spanish Statistical Yearbook (*Anuario Estadístico de España*) for the years 1860, 1910, 1920 and 1930.[9] These figures allowed us to distribute Spain's mining gross value added at factor cost between the different provinces. However, given the absence of direct production data for 1900, we resorted to an alternative methodology: the active provincial population engaged in mining in 1900 was multiplied by a productivity coefficient obtained from 1920 data.[10] In other words, we assume that labor productivity in mining in each province in 1900 was equal to that in 1920.

Industry: Manufacturing and Public Utilities

To carry out the estimation of regional industrial value added, we begin by assuming the existence of a production function with constant returns to scale where the output is obtained from the contribution of two production factors, labor and capital.[11] The industrial gross value added (GVAIND) is defined as:

$$(4)\ GVAIND_{it} = \alpha_{it} (\omega_{it} * L_{it}) + (1-\alpha_{it}) (r_{it} * K_{it})$$

with α_{it} being the share of the wage income in industrial gross value added in region *i* at time *t*, ω_{it} industrial wage in region *i* at time *t*, L_{it} the total active industrial population in region *i* at time *t*, r_{it} the returns to capital in industry in region *i* at time *t*, and K_{it} the capital stock in industry in *i* at time *t*. For the Spanish case, there is information available for each of the components of equation (4) except for r_{it}. For this reason, we had to assume perfect capital mobility. Then,

[8] The source of wages is Rosés and Sánchez-Alonso (2004), and the source of agricultural population is the Spanish population census.

[9] We have taken the values of 1915 for 1910 and 1931 for 1930.

[10] This is the year in which mining workforce was more exactly registered by Spanish population census (Foro Hispánico de Cultura, 1957).

[11] In this sector, we have followed the refinement of Crafts (2005) to the original Geary and Stark (2002) methodology, using tax data to allocate non-wage manufacturing income across regions.

$$(5)\ r_{it}=r_t \qquad \forall\ i$$

The wage income included in equation (4) was estimated as follows. First, the series concerning industrial employment in each province were compiled from the information provided by the Population Censuses of 1860, 1900, 1910, 1920 and 1930.[12] Then, we collected the data available on nominal industrial wages from a variety of sources.[13] Finally, under the assumption that the number of yearly working days is identical in all provinces, we computed the wage income by multiplying wages by the size of the industrial working population.[14]

The data for constructing provincial capital income in equation (4) were drawn from several fiscal sources. The main source for our calculations is the *Estadística Administrativa de la Contribución Industrial y de Comercio (EACI)* that collects all statistical information on the industrial tax, which was established in 1845. This industrial tax consisted of a fixed rate over the main means of production in use (Nadal and Tafunell, 1992, p. 256). The rate was different for each type of machinery and industrial branch, but did not adjust immediately to changes in machinery productivity. Furthermore, the coverage of this tax was modified substantially by 1907. Joint stock companies, which were the largest Spanish industrial firms, were exempted from industrial tax payment but assigned to a new corporate tax based on net profits (*Impuesto de Sociedades*). More prominently, over the years, many firms transformed themselves into joint stock companies in order to benefit from the lower tax rates of this new corporate income tax (Nadal and Tafunell, 1992, p. 259). Later, in 1921, all types of partnerships were assigned to this corporate tax, and hence, many firms were exempted from the payment of the old industrial tax. In consequence, from the year 1907 onward, the information given by the EACI is not representative of industrial activities. Fortunately, Betrán (1999: 674-675), in this monumental study on the industrial localization in Spain in the first third of the XXth century, reconstructed the industrial taxes paid in each province in 1913 and 1929, employing data on the two types of taxes paid by industrial companies. In sum, fiscal sources and Betrán (1999) allow us to compute the regional participation in the capital income in 1856, 1893, 1913 and 1929.[15]

Once the provincial distribution of labor and capital income is obtained, we need to calculate the weight of each factor's income in total industrial gross value added. In this respect, substantial international evidence shows that the output proportions in labor and capital remain relatively stable for long periods (Gollin, 2002). For this reason, we have opted to compute different factor-shares for each industry, but not for each industrial benchmark. It should be noted, however, that, given that provincial industrial structure varies over time,

[12] We have also corrected for errors and underreporting of original data according to Foro Hispánico de Cultura (1957).

[13] Madrazo (1984) provided data for 1860, Sánchez-Alonso (1995) for 1900, Ministerio de Trabajo (1927) for 1920, and Silvestre (2003) for 1910 and 1930. However, this kind of data is not available for the Canary Islands; we had to assume that their wages are equal to the lowest of the Peninsula.

[14] It should be noted that the coverage of the wages database is far from perfect; thus, we had to make some assumptions: first, the series of wages, not homogeneous throughout time, are representative of industry; second, as regards the use of nominal wages, there will be bias to the extent that there are regional variations in price levels (Geary and Stark, 2002, pp. 933-934).

[15] For 1920, due to the absence of fiscal data, capital shares were interpolated employment figures for 1910 and 1930. Finally, the addition of the Basque Country and Navarre in the second half of the XIXth century relies on the data in Parejo (2001), who estimated the contributions of these regions to the Spanish total based on the historical indices of industrial production. This regional information was split by provinces according to the share of industrial active population in each date.

these shares also varied in the different benchmarks at the provincial level. More specifically, to compute these factor-shares, we used the information from the Input-Output Table for Spain in 1958 (TIO1958).[16] From this source, capital and labor shares were calculated for nine industrial branches.[17] We thus can identify, for this level of aggregation, the factor-shares according to the productive structure of the industrial sector in each province and year. The data on the provincial productive structure by year were obtained from the same fiscal sources discussed in the previous paragraph. Finally, with this information, specific factor-shares for each province and for each benchmark were constructed, except for the Basque Country and Navarre.[18]

Construction

This sector is composed of two subsectors: residential construction and public works. Data on residential construction were distributed across provinces, with data on urbanization rates (the percentage of the population living in cities with more than 5,000 inhabitants) from Reher (1994). In the case of public works, we distributed gross national value added across provinces, with data on the provincial stock of infrastructures from Herranz (2008).[19]

Services

Many historical studies have suffered from the absence of information on wages in the service industries. Geary and Stark (2002: 923), who faced the same problem in their study of the British economy, calculated the service sector wages as a weighted average of the agriculture and industry series in each province, where the weights were each sector's share of the labor force. Our strategy is slightly different. Prados de la Escosura (2003) provided the gross value added of eleven different branches of the Spanish service industry: transport, communications, trade, banking and insurance, housing, public administration, education, health services, hotels and restaurants, domestic services and professions. Taking into account this level of disaggregation, we compiled the data on the active population from the Population Censuses. We scaled the absolute values so that the provincial total for each sector adds up to the Spanish totals for the working population engaged in services from Prados de la Escosura (2003). Then, according to the skills and productivity levels of the workforce, we employed different wages. More specifically, we resorted to agrarian wages for domestic service; an unweighted average of industry urban unskilled and skilled wages for commerce, hotels and restaurants; an unweighted average of agrarian and industry urban wages (unskilled and skilled) for transport and communications; and, finally, urban skilled wages for the remaining branches.[20]

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[16] Using this source to elaborate the factor-shares and then apply them in retrospect implies the assumption that the intensity in the use of factors in 1958 is a good proxy for previous years. However, we have to point out that this assumption has also been employed in previous estimations of the Spanish Industrial Production Indices (Carreras, 1983; Prados de la Escosura, 2003).

[17] The industrial branches are food, textiles, metal, chemicals, paper, wood, ceramic, leather and miscellaneous industries. However, due to data restriction, the industrial branches considered are only seven (food, textiles and footwear, metal, chemicals, paper, wood and cork, and ceramics) in 1913 and 1929.

[18] Since this fiscal information is not available for the Basque Country and Navarre, and it is not possible to know their industrial structures, a similar labor share to the Spanish total is assumed for these regions.

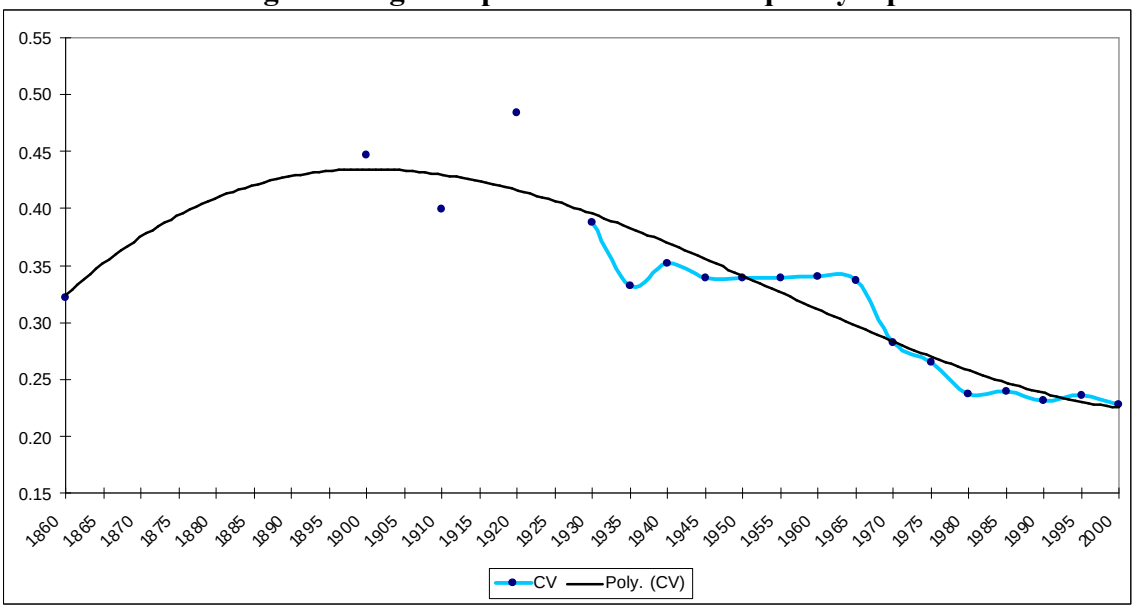
[19] Given that Herranz's (2008) database is only available from 1870 onwards, the data for 1860 was only based on urban population.

[20] Underlining wages were drawn from Rosés and Sánchez-Alonso (2004).

Finally, in order to be able to link our regional GDP estimation for the years 1860-1930 with those existing for the years 1930-2000, we have also escalated all the original absolute figures on sectoral and regional GDP so the NUTSII totals add up to the Spanish total offered in Prados de la Escosura (2003).

These new dataset consents us to carry out a preliminary description of the regional income inequality in Spain in the long-term. In this respect, Figure 1 presents the long term evolution of regional per worker GDP inequality measured through the Coefficient of Variation (CV). As it can be seen in the figure, also in the Spanish case there was a growing trend in income inequality between the first two cut-off points to be analysed, that is the years between 1860 and 1900. Since that date, it started a period of gradual reduction of regional income inequality. Nevertheless, it has also to be stated that regional per worker income convergence accelerated during the period 1960-1980, and that it seems to find a halt in periods such as the 25 years following the Spanish Civil War and in the years following the Spanish adhesion to the former EEC (nowadays EU). In the long term, regional income inequality would have followed a U-shaped pattern with a growing phase between 1860 and 1900 followed by a long phase of regional inequalities reduction that would have lasted until the 1980s. From then on, the persistence of regional inequalities could be pointing to the end of this regional σ-convergence process.

Figure 1
Long term regional per worker GDP inequality. Spanish NUTS3



In short, the descriptive evidence about the evolution of regional income inequality in Spain illustrates that its long term evolution might have followed a U-inverted shape and so, that its trajectory could be consistent with the existence of both kinds of forces highlighted by the theoretical literature. Those proposed by traditional growth and trade theories that point out to the reduction of regional income inequalities along the process of integration of national economies and those pointed out by NEG models where growth and integration could favour agglomeration in the productive processes, which in the context of a reduction of transaction costs could favour an initial increase in income inequalities. Nevertheless the

interruption of the process of reduction of income inequalities during the years 1980-2000 puts some caveats on the validity of this plain explanation.

4. The determinants of Regional Inequality

As we noted in the introduction, differences in regional income, from the trade theory perspective, rely on differences in relative factor prices and industrial structure of the regions. Besides, as it has been pointed out by NEG models and New Growth Theory, differences in productivity can be related to differences in the size of regions and in the case of increasing returns they could last and even amplify in the long-term. In order to approach the overall causes of labor productivity differences across Spanish regions in this section we first will compute the Theil T index (Theil, 1967) for all the tens years considered in this study.[21] This index allows us to measure regional inequality in labor productivity using GDP at the industry level and employment figures according to the following equation:

$$(9)T = \sum_{j=1}^{3}\sum_{i=1}^{n}\left(\frac{Y_{ji}}{Y}\right)\log\left(\frac{Y_{ji}/Y}{E_{ji}/E}\right) = \sum_{j=1}^{3}\sum_{i=1}^{n}\left(\log(x_{ji}) - \log(\bar{x})\right)\frac{Y_{ji}}{Y},$$

$$\bar{x} = \frac{Y}{E}$$

where Y is per capita GDP, E is employment, *j* indexes industries and *i* regions. The additive decomposability of the Theil index makes possible its decomposition into two components: the *within-sector* inequality component (T_w) and the *between-sector* inequality component (T_B). Specifically, equation (9) is decomposed into:

$$(10)T = T_W + T_B = \sum_{j-1}^{3}\left(\frac{Y_j}{Y}\right)T_j + \sum_{j-1}^{3}\left(\frac{Y_j}{Y}\right)\log\left(\frac{Y_j/Y}{E_j/E}\right),$$

where

$$(10a)T_jW = \Sigma_j(j-1)^{\wedge}3\,(Y_jj/Y)\;\Sigma_j(i=1)^{\wedge}n\,[(\log(x_jji) - \log(\bar{x}_jj))\,(Y_j(ji)\;)/Y] \quad \text{for } j = 1, 2 \text{ and } 3,$$

and

$$(10b)T_B = \sum_{j-1}^{3}\left(\frac{Y_j}{Y}\right)\log\left(\frac{Y_j/Y}{E_j/E}\right) = \sum_{i-1}^{3}\left(\log(\bar{x}_j) - \log(\bar{x})\right)\frac{Y_j}{Y}.$$

T_w presents the weighted average of regional inequalities in labor productivity within each sector, while T_B presents inequality in labor productivity between sectors (agriculture,

[21] More specifically, we follow the approach of Akita and Kataoka (2003).

industry and services). The results of computing these different Theil T indices are displayed in Table 2 and Figures 2 and 3.

Table 2

		1860	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Decomposition													
Primary	**Inequality**	0.03	0.03	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.02
	GDP share (%)	39.46	29.89	27.85	31.93	22.78	26.80	28.71	22.93	12.37	6.55	4.98	3.63
Secondary	**Inequality**	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
	GDP share (%)	20.44	30.28	30.73	30.20	32.25	23.26	27.02	35.18	35.99	34.70	34.23	30.52
Tertiary	**Inequality**	0.02	0.01	0.01	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	GDP share (%)	40.10	39.83	41.42	37.87	44.97	49.94	44.27	41.90	51.63	58.75	60.78	65.85
Within-sector inequality		0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Between-sector inequality		0.05	0.16	0.14	0.07	0.06	0.07	0.04	0.03	0.03	0.03	0.01	0.01
Overall Inequality		0.07	0.18	0.15	0.08	0.08	0.08	0.05	0.03	0.04	0.03	0.01	0.01
Contribution (percent)													
Primary		17.37	4.28	2.17	6.34	7.24	3.75	4.92	6.98	5.32	4.45	9.88	6.85
Secondary		2.91	3.54	4.89	7.83	9.31	1.94	3.82	4.55	3.21	1.64	2.20	9.95
Tertiary		9.39	2.07	1.59	7.09	5.23	2.22	4.94	5.04	4.28	4.70	12.79	24.00
Within-sector component		29.67	9.89	8.65	21.26	21.78	7.92	13.68	16.57	12.81	10.79	24.87	40.79
Between-sector component		70.33	90.11	91.35	78.74	78.22	92.08	86.32	83.43	87.19	89.21	75.13	59.21

Theil Inequality Index, Spanish Regional GDP per worker, 1860-2000
Overall and Sectoral Decomposition

As we can see in the Table 2 and Figure 2, the overall regional inequality in per worker GDP grew dramatically from 1860 to 1900, leveled between 1900 and 1910, and decreased thereafter. Nevertheless, in 1930, the levels of regional inequality still exceeded by about ten percent those prevalent in 1860 (0.08 in 1930 versus 0.07 in 1860). Notwithstanding, from 1940, overall inequality followed a decreasing path that has lasted until the last years of the whole period. As a consequence, the values of the Theil index show us that regional income inequality in 2000 (0.01) is eight times smaller than it was in 1930 (0.08) or 18 times smaller than it was when it reached its peak in 1900.

As we can also see in Figure 3, the *between sector* effect accounts for the lion's share of regional inequality: With the exception of the last point in time considered, it explains more than 70 percent of variation in all the rest of the period. Nevertheless it is also interesting to point out the significant role played by the within sector effect both, in the first long wave of economic integration and high regional inequality (with values next to 30% in 1860 and 20% in 1920 and 1930), and in more recent times, where the within sector effect range from approximately 25% of overall inequality in 1990 to 40% in 2000. These two results together give strong support to the hypothesis that relates the upswing of regional inequality to the structural differences across regions emanating from the process of regional industrial concentration in the XIXth century (Williamson, 1965) and that poses that convergence in sectoral shares across regions would have enhanced the process of convergence across regions. Nevertheless, the data also give room to differences in productivity as causes of overall inequality in some periods, especially in periods of high

inequality such as those between 1860 and 1930 or of inequality stagnation like the last years of the XXth century.

Finally, it would also be interesting to revise the contributions of the different sectors to the *within sector* component (Table 2). In 1860, surprisingly, the sector with the major regional differences in labor productivity was the primary sector. What could account for these differences? We believe that two factors were involved: the large differences in relative land endowments and climate across Spanish regions and that we did not consider temporary labor migrations across regions, which were very important during harvest periods (Silvestre, 2007). The relative importance of different sectors varied after 1910 and until 1930, when industry became the main contributing sector to the *within component*. This result falls in line with previous investigations that have underlined the presence of increasing returns in Spanish manufacturing during the period (Martínez-Galarraga *et al.* 2008). It is also worth noting that during the last years it has been the differences in productivity in the third sector which have accounted the most in explaining the within sector component of the Theil inequality index, following a growing path from 1970 to 2000.

Figure 2

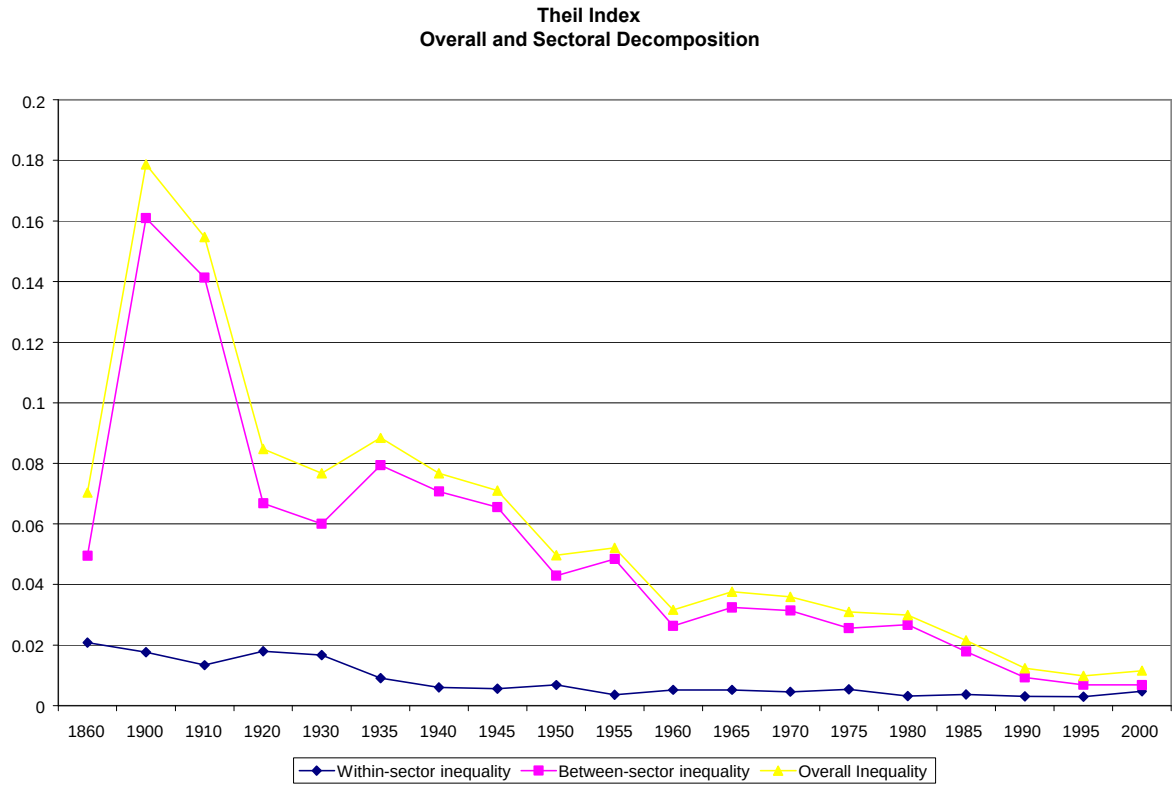
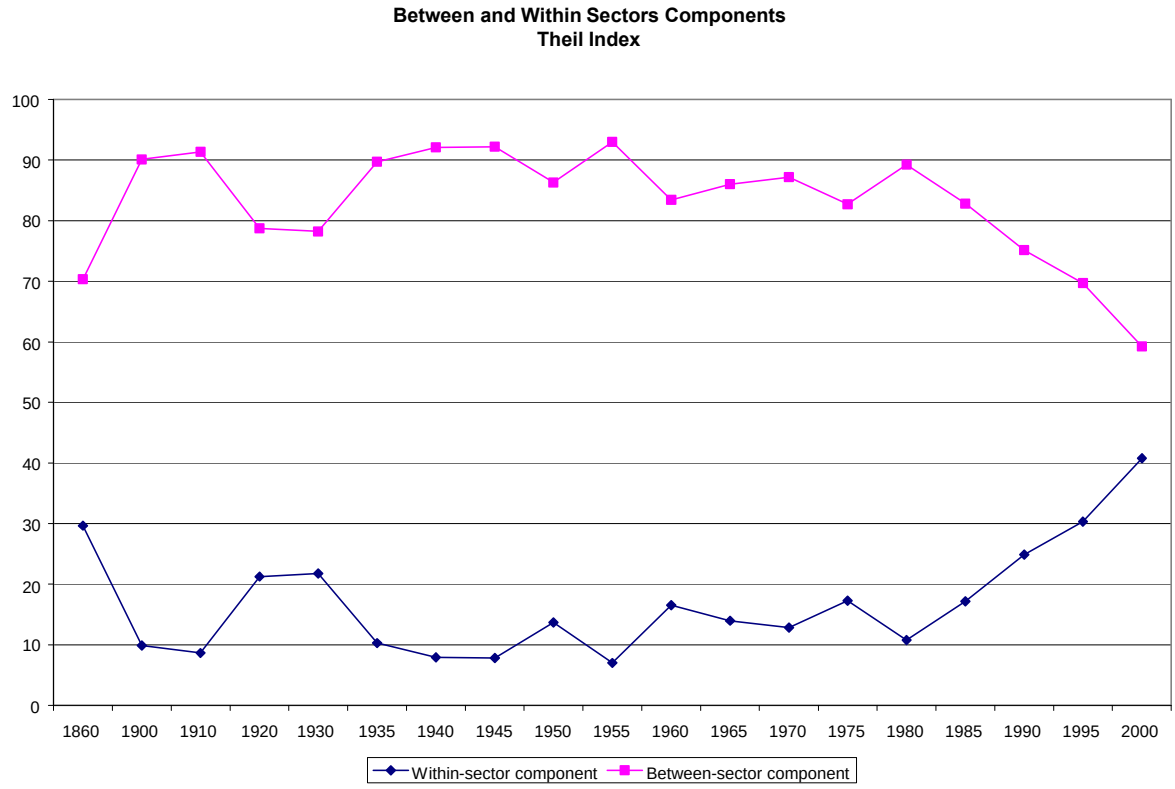


Figure 3



To offer some light to individual stories, we also investigated this question by utilizing a straightforward modification of the procedure developed by Hanna (1951) and also employed by Kim (1998) to separate income differences into industry-mix and gross value added (GVA) components.[22] The procedure involves constructing two hypothetical regional per worker GDPs and comparing them with actual per worker GDPs. The first assumes that all regions have identical industry mixes and identical industry per worker GVAs, with the industry mix and per worker GVA set equal to the overall national average. The second hypothetical per worker GDP assumes that regions have different industry mixes but identical per worker GVAs, which are set equal to the national average. The difference between the two hypothetical incomes, which are based on industry-mix income and the overall national GVA, furnishes a measure of the GDP per worker disparities caused by the divergence in regional industrial structures (*industry-mix effect*). The difference between the actual GDP and the hypothetical industry-mix income is a measure of the regional GDP per worker variations due to divergence in per worker GVA (*productivity effect*).[23] The results of this exercise are shown, for selected years, in Table 3.

[22] Per worker GVA in industry and region i is: $GVA_i = (w_i L_i + r_i K_i) / L_i$. However, given the presence of perfect capital markets, $r_i K_i / L_i$ should be equal across all locations. Consequently, w_i drives per worker GVA differences across all regions.

[23] The use of one-digit industrial classification in our calculations may conceal the greater importance of productivity in explaining regional differences in income per worker than is deserved. Regional per worker GVA in manufacturing and services activities may be different due to variations in regional industrial structures at a finer industry level.

Table 3. Hanna-Kim decomposition

		1860	1900	1930	1940	1950	1960	1970	1980	1990	2000
Andalusia											
	Industry-mix	2.3	2.7	-9.4	-5.75	-7.42	-8.48	-6.60	-6.05	-3.67	-3.12
	Wage-effect	30.9	-6.7	-10.7	-8.01	-12.18	-16.08	-10.48	-8.10	-8.57	-11.02
Aragon											
	Industry-mix	-4.1	-3.3	-4.7	-5.59	-8.54	-3.80	-4.62	-1.37	-0.70	-0.68
	Wage-effect	8.2	0.5	0.7	3.34	-3.71	0.24	2.08	2.04	1.16	4.46
Asturias											
	Industry-mix	-15.4	-24.4	4.6	0.67	1.16	2.03	-5.09	-5.26	-2.80	-1.53
	Wage-effect	-47.8	-8.8	-2.3	14.33	7.06	-4.53	2.14	1.25	-6.95	2.26
Balearic I.											
	Industry-mix	-5.1	1.5	6.2	7.18	5.87	3.99	7.78	6.72	3.73	3.58
	Wage-effect	-19.5	-38.1	2.2	2.32	-0.50	0.68	-2.67	-2.28	2.04	-18.18
Canary I.											
	Industry-mix	-2.3	0.1	14.3	2.86	-9.99	-9.76	1.36	1.76	1.22	0.41
	Wage-effect	-26.6	-46.7	-33.8	-8.45	-3.68	-5.70	-6.49	-3.48	1.18	-11.32
Cantabria											
	Industry-mix	-1.6	0.9	8	3.83	5.09	0.81	-4.23	-4.96	-2.05	-1.53
	Wage-effect	-19.3	-10.4	11.3	-10.11	-2.63	4.83	5.82	1.45	-4.92	9.87
Castile L.M.											
	Industry-mix	2.8	-12.7	-17.5	-26.44	-16.32	18.13	16.85	-11.90	-4.00	-4.52
	Wage-effect	6.3	9.6	-17.8	-10.91	-10.77	12.08	10.99	-12.37	-9.85	-13.73
Castile L.											
	Industry-mix	-1.6	-18.9	-9.1	-13.01	-9.23	12.61	14.00	-10.13	-4.57	-2.25
	Wage-effect	-10.6	-0.3	-13.8	-0.29	2.02	11.12	-7.89	-7.83	-7.43	0.61
Catalonia											
	Industry-mix	9.8	30.8	15.1	15.66	15.05	11.84	9.12	7.13	3.93	2.44
	Wage-effect	6.8	28.9	19.4	10.69	11.85	14.18	9.58	8.01	6.20	5.58
Valencia											
	Industry-mix	-0.9	1.9	0.6	-3.62	-2.94	0.32	1.76	2.70	1.50	1.37
	Wage-effect	7.4	11.5	15.4	1.54	-0.38	0.88	-2.18	-2.38	-1.67	-15.03
Estremadure											
	Industry-mix	-3.8	-19.6	-13.1	-37.01	-27.28	24.16	26.01	-17.86	-9.05	-7.91
	Wage-effect	-18.2	-19.7	-37	-20.70	-22.26	22.82	26.97	-18.52	-14.56	-24.19
Galicia											
	Industry-mix	-14.7	-35.5	-18.8	-25.10	-21.11	24.34	30.75	-28.80	-15.25	-9.10
	Wage-effect	-69.4	-50.1	-37.7	-13.97	-17.51	28.63	25.98	-19.79	-18.39	-14.06
Madrid											
	Industry-mix	29.1	58.7	36.5	34.70	26.26	16.24	15.69	11.34	4.77	3.87
	Wage-effect	14.7	0.9	22.4	-1.75	4.97	13.84	8.74	9.59	11.39	14.43
Murcia											
	Industry-mix	0.8	-11	-0.9	-8.99	-6.09	-4.32	-1.49	-3.75	-2.52	-4.02
	Wage-effect	12.8	-18.5	-5.3	-12.29	-22.99	15.82	10.71	-10.18	-5.21	-10.42
Navarra											
	Industry-mix	3.8	-0.1	-11.9	-5.09	-2.42	-0.73	-0.79	1.33	2.48	0.20
	Wage-effect	5	-10.5	11	10.74	4.34	7.87	6.41	5.79	3.14	16.25
Basque C.											
	Industry-mix	4	34.4	19.4	13.14	9.59	11.07	8.35	6.50	3.80	1.57
	Wage-effect	-21	21.8	26.9	16.72	27.76	19.29	18.50	9.95	7.53	18.80
Rioja											
	Industry-mix	2.2	7.3	0.4	-4.22	-2.16	-5.95	-8.80	-3.65	-1.13	-2.56
	Wage-effect	-3.2	6.6	-15.4	15.99	2.53	4.82	1.03	4.24	1.83	1.15

The evidence presented in Table 3 shows that variations in both industry mix and labor productivity at the broad industry level played central roles in explaining GDP per worker differences. More prominently, in most cases, a direct correlation is observable between industry-mix and wage effect. This result implies that a favorable industry-mix is accompanied by higher wages, while the contrary also holds. Nevertheless, in order to detect some additional facts, let us now summarize several relevant regional stories: those of Catalonia, the Basque Country, and Madrid, as examples of successful stories. Those of Andalusia, Galicia, Estremadure and Castile LM as examples of failed growth experiences in comparative terms.

With the exception of 1935, Catalonia has enjoyed one of the three top-ranking positions in per-capita GDP since 1860 and until the 1995. Only in the last point in time analyzed this region has fallen down until the sixth position in the ranking. At first sight, this ranking position was due to both a favorable industry-mix and a productivity effect. Nevertheless from the 1970 on, the values reached by these two favorable effects started to lose the step in comparison with those registered by Madrid or the Basque Country. Mainly, the positive effect on the wage-effect fell clearly behind of those attained by Madrid and the Basque County, and in the end, Catalonia lost its position in the top three of the ranking in 2000. The history of the Basque Country summarizes perfectly the consequences of rapid industrialization and subsequent structural change. In 1860, the Basque Country was not in the top-ranking positions of per capita GDP in Spain, and its industry was relatively small. So, the Basque Country had a highly negative productivity effect (more than 20 percent below the Spanish average). However, only forty years later (in 1900), when Basque industrialization was underway, this situation had changed dramatically: it outperformed Spain in both industry-mix and productivity effects by more than 20 percent in productivity and 34 percent in industry-mix. This Basque lead was still present in 1930, although its advantage due to industry-mix had decreased to less than 20 percent given the spread of industrialization to more Spanish regions. Nevertheless, along the second half of the XXth century the Basque Country has could maintain its leadership thanks to the contribution of a large and favorable productivity effect. The position held by Madrid in the Spanish per worker regional income is explained mainly first because of its favorable industry-mix (in this case related to the preeminence of the service sector) and that it has been the case until 1970 but Madrid has also managed to obtain an increasing positive productivity-effect from 1980 on. It seems that the long term process of convergence of the economic structure across Spanish regions has made that only the regions with favorable and high productivity effects have been able to maintain the top positions in the very long term.

In a sharp contrast, Galicia, Estremadure and Castile LM have been among the low-ranking per-capita GDP regions throughout the period. Corresponding with this low income level, their industry-mix and productivity effect have been unfavorable (in other words, these regions specialized in the less productive industries, and its labor productivity was below the Spanish average in all of them). Nevertheless it is also worth pointing out that, in general terms, during the years 1860-1960 the main negative effect for these regions has been the industry mix effect, and that from then on it has been the high and negative productivity effect which have accounted most for maintaining their position at the bottom of the ranking. The behavior of Andalusia, the most populated region in Spain, is slightly different. In 1860, it was the second richest Spanish region, but in 1930 was in position 12 (of 17), with a per-capita income of only about 75 percent of the Spanish average. The initial pre-eminence of Andalusia was not due to region's industry mix, but to its favorable productivity effect. Forty years later, in 1900, this advantage had vanished, and its productivity was slightly below the

average; in addition, its industry-mix was not particularly different from the nation's average. From then on, it seems rather clear that the negative productivity effect has been at the still front of the low position of this region in the Spanish per worker income ranking.

In short, it seems that the explanation of the factors behind the successful or failing positions of regions in terms of per worker GDP has changed along the long term national experience of growth and integration. During the initial phases it has been the industry-mix effect the main factor determining the relative position of regions. Further on, the convergence of economic structures have determined that the main explanation of the top and bottom positions was linked to the presence of marked positive or negative productivity effects. This factor has earned more and more explicative power along the growth experience during the XXth century. In fact, the region that has most improved its position in the ranking along the XXth century, Navarre (11th in 1900 and 3rd in 2000), never had an extremely positive industry-mix effect and its successful experience is basically explained but the presence of a favorable and high productivity effect.

5. Conclusions

In this paper we have offered a long term view on regional inequality in Spain and we have also tried to point out to some of its proximate causes. For doing that we have assembled a new data base on regional per worker GDP that links new estimates for the period 1860-1930 with those existing for the years 1930-2000. As a result, we have been able to analyze the long term evolution of regional per worker GDP inequality across Spanish NUTS2 regions and to decompose it into its proximate determinants.

Spanish regional income inequality has followed a long term U-inverted shape pattern. But it has to be mentioned that during the years 1980-2000 it seems to be experiencing a new trend towards a limited growth of inequality. That is to say, a new upswing turn in the process that prevents that the reduction of inequality went beyond the point reached in the 1980s.

The decomposition of inequality in terms of that generated by differences in productivity across regions or by the existing differences in economic structure has shown that growing dissimilarities in both components acted side by side in explaining the upswing phase of inequality in the second half of the XIXth century. From them on, the growing convergence of economic structures accounted the most in the explanation of the reduction of regional incomes inequalities. Nevertheless, differences in productivity have remained quite stable and they are the main mechanism at work in explaining the current slightly growing phase of regional income inequality.

This kind of evidence fits well with the stories proposed by neoclassical trade and growth theory, in the sense that the advance in the process of national market integration could have favored the reduction of regional income inequality in the long term (mobility of factors of production could have impulsed the reduction of differences in factor endowments and rewards across regions), but also fits well with stories arising from New Growth Theory and New Economic Geography models. Albeit the great level of national market integration could have also propelled the redistribution of activity across Spanish regions after an initial phase of agglomeration, differences in productivity have remained in the long term and, besides, they have been amplified during the last years of the XXth century, when the Spanish

economy has been involved in a new institutional framework. This is its growing integration in the European market. So, albeit growing inequality during the initial phase of growth and internal market integration can be explained through the consideration of the divergence of economic structures and the presence of differences in productivity across regions, in the last years it is the growth of productivity differentials, basically in the service sector, what explains the new upswing trend in regional income inequality in Spain.

Particular regional stories confirm this perception. The explanation for the factors behind the success or fail of regions in terms of per worker GDP has changed along the long term national experience of growth and integration. During the initial phases it has been the industry-mix effect the main factor determining the relative position of regions. Further on, the convergence of economic structures have determined that the main explanation of the top and bottom positions was linked to the presence of marked positive or negative productivity effects.

In short, it could be argued that, initially, structural change (industrialization) was concentrated in a reduced group of regions that also experienced the greater increases in productivity, favoring the initial increase of inequality across Spanish regions. From the beginning of the XXth century, further advances in the integration of the national market favored the mobility of factors of production and, with low transport and transaction costs, a fast convergence of regional economic structures that provoked the reduction of income inequalities. Notwithstanding, productivity differentials remained, preventing further advances in the reduction in income inequalities and, in the last years analyzed, this productivity differentials were at the forefront of the explanation of the apparent upsurge of regional inequality in the context of the integration of the Spanish economy in the European Union.

Our results also have important implications for judging the validity of alternative theoretical explanations for regional inequality. Broadly speaking, it seems that the proposal of Epifani (2005), which combines HO and NEG models, could help out to explain the Spanish historical experience. More prominently, as our decomposition of per capita GDP in productivity and industry-mix effects shows, regions that specialized in the most productive industries also enjoyed the higher labor productivity levels. In other words, they had favorable endowments and also benefited from NEG forces. However, it seems that HO forces were the main driver behind unequal regional development, given that *between-sector* differences accounted for the lion's share of regional differences in labor productivity. However, the increasing returns explanation, mainly related to *within industry* differences in industry and services, was also significant in the first phase of Spanish economic growth and market integration, and it is significant again during the current phase of growth and Spanish integration in the European single market.

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