

AFC ASSOCIATION FRANÇAISE
DE CLIMÉTRIE

WORKING PAPERS

Nr. 9, 2017

Four Decades of Study on Growth
Disparities across Regions in France:
Achievements and Prospects.

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Four Decades of Study on Growth Disparities across Regions in France: Achievements and Prospects

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Regional economic history developed on the basis of the methods that quantitative history had used to describe the long-term growth of industrialized countries. The study of the dynamics of regions was somewhat abandoned after the 1980s. But the new economic and social problems linked to the opening of borders now cause a renewed interest in analyzing the economic destiny of the infra-national territories.

It seems useful to resume the work in a field where all the data are far from being exploited and where major projects launched nearly half a century ago by economist historians such as Maurice Lévy-Leboyer have remained unfinished. The purpose of this communication is to summarize the different studies carried out in France on this subject since the end of the 1960's and to suggest some new ways of research.

A new subject of study: regional growth

In the aftermath of the Second World War, the publication by the member countries of the United Nations of their national economic accounts gave several economist historians the idea of constructing retrospective accounts in order to grasp a phenomenon whose scope was beginning to be appreciated : long-term economic growth. The first was Simon Kuznets, who in 1951 measured the growth of the United States since 1870¹. Following this, several economist historians constructed annual indexes of production for different countries in Europe², going back as far as possible, sometimes up to the XVIIIth century. This work continued for all the countries of the world under the direction of Angus Maddison at the Center for Growth and Development of the University of Groningen³. From then on, it was possible to compare the growth rates, to date the take-offs, or to assess the magnitude of crises, with much greater precision than was previously done.

At the beginning of the 1970s, a new idea was formulated: in countries of a certain size, the economic growth observed at the national level was in fact only the resultant of regional growths with contrasted patterns. The region, more homogeneous than the nation in its various physical and human characteristics, appeared to be the most appropriate territorial unit to study the dynamics of territories and to explain the disparities in economic growth across territories⁴. The national framework presented the defect of the macroscopic scale, namely, the excessive heterogeneity of the characters, whereas the regional framework was closer to the mesoscopic scale, which allowed the maximum homogeneity of the character distribution within the same territory and, on the other hand, the maximum dispersion of their distribution between each territory.

Another benefit of research on regional growth and disparities between territories lay in their forward-looking value: in a world which evolved since the end of the Second World War towards generalized free trade, the study of the economic fates of regions offered to the economists the experimental model of a world without customs barriers. It showed how, within the same country, phenomena of concentration of industries in favour of some territories were accompanied by the deindustrialisation of other less competitive territories. By the end of the 1960s, when customs frontiers disappeared in the Common Market and the Kennedy Round negotiations began to trigger global customs disarmament, large countries were soon going to be themselves confronted with the

¹ "Long-Term Changes in the National Income of the United States of America since 1870", in: *Income and Wealth of the United States : Trends and Structure*, Bowes and Bowes, Cambridge 1951.

² Phyllis Deane & William A. Cole, *British Economic Growth, 1688-1959*, Cambridge U.P., 1962. Jean Marczewski, "Le produit physique de l'économie française de 1789 à 1913 (comparaison avec la Grande-Bretagne)", *Cahiers de l'ISEA*, AF 4, n° 163, juil. 1965. Walther Georg Hoffmann, *Das Wachstum des deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Berlin, Springer, 1965.

³ Angus Maddison, *Statistics on World Population, GDP and per capita GDP*, AD, <http://www.ggdc.nl/maddison>.

⁴ Bowden, Witt et al., *An Economic History of Europe since 1850*, New York 1937. Frederic Lane, "Units of Economic Growth Considered", *Kyklos* 15, 1962. Sidney Pollard (éd.), *Region und Industrialisierung*, Göttingen, Vandenhoeck & Ruprecht, 1980, p. 12. Hubert Kiesewetter : *Region und Industrie in Europa 1815-1995*, Franz Steiner Verlag, Stuttgart 2001, p. 13-25.

situation in which already lived the regions for a long time. However, the tools used by forecasters were developed in the days of the protected economies, and despite the warnings of Raymond Courbis, the opening of borders was not sufficiently taken into account by forecasters⁵.

Of course, it was no question of making regional economic history as historians had practiced in the past, collecting scattered facts, more or less significant figures and some testimonies. It was necessary, as had been learnt at the national level, to reach a synthetic view of the evolution of economic activity by reconstructing regional aggregates and, if possible, in the form of continuous annual series. To be able to specify, in the year near, the date of a major inflection in an evolution allowed to establish links between historical facts and to detect between them unsuspected relationships. For that purpose, it was necessary to resort resolutely to the techniques of quantitative history. The implementation of such an operation at the sub-national level was faced with problems more difficult to solve than those faced by the retrospective national accounts. The first problem was the lack of regional quantitative data: some figures were obtained only at the national level, starting from customs statistics (for example, quantities of raw cotton imported, from which to reconstitute the national production of cotton yarns). The second problem was, in many countries, the instability of the boundaries of sub-national regions.

France, a particularly favourable study area for space econometrics

France seemed to lend itself well to this type of research: the abundance of statistics collected by its administrations and the stability of the territorial division established in 1790 made possible the calculation, for every department, of annual production indexes from the end of the first Empire to the present day⁶.

As early as 1836, Adolphe d'Angeville, studying the departemental figures of population and production, had for the first time pointed out the opposition between two unequally developed parts of France on either side of a line Saint-Malo-Geneva⁷. North-east of this line, was located the most literate part of France and also the wealthiest.

Aggregating the figures of several departments and resuming the division into "program regions" as defined by the decree of 30 June 1955 and slightly modified two years later as a result of the work of a young advisor to the *Cour Des Comptes*, Serge Antoine, it was possible to create regional ensembles on a virtually mesoscopic scale. Serge Antoine relied on the study of telephone flows to give a map of the regions of mainland France which remained almost unchanged from 1958 to 2015. The choice of this framework for economic studies, corresponding to the second level of the nomenclature of the statistical territorial units of the European Statistical Office (NUTS 2) was later confirmed by the geographer Jean Labasse⁸. With the exception of a few relatively heterogeneous regions, such as Rhône-Alpes, which was formed in 1960 by the fusion of the Rhône region and the Alps region, the French program regions adapted well to the requirements of such research.

Regional production indexes for the nineteenth and twentieth centuries

The method of calculating the regional production indexes consisted in constructing Laspeyres chain indexes, the weighting coefficients being revised approximately every fifteen years. In the early 1970s, Maurice Lévy-Leboyer had the idea to launch several young researchers (they were young at that time) on regional growth studies. Professor at the University of Caen, he coordinated the research of his students on the evolution of agricultural income in the Basse-Normandie region. The result of this work was published in 1972⁹. By writing the introduction to this book, Maurice Lévy-Leboyer spoke of "deindustrialisation", a word which made his first appearance in the French language at a time when the rich countries believed themselves to be the

⁵ Raymond Courbis, *La détermination de l'équilibre général en économie concurrentielle*, Paris, Éd. du CNRS, 1973. Raymond Courbis, *Compétitivité et croissance en économie concurrentielle*, Paris, Dunod, 2 vol., 1975.

⁶ Michel Hau, « L'étude de la croissance régionale de 1810 à nos jours: données et lacunes », *Pour une histoire de la statistique*, INSEE, Paris 1977.

⁷ Adolphe d'Angeville, *Essai sur la statistique de la population française considérée sous quelques-uns de ses rapports physiques et moraux*. Première édition en 1836. Réimpression Paris, Mouton, 1969.

⁸ Cf. Jean Labasse, *Quelles régions pour l'Europe?*, Paris, Flammarion, 1994, p. 27.

⁹ Maurice Lévy-Leboyer, *Le revenu agricole et la rente foncière en Basse Normandie*, Paris, Klincksieck, 1972

exclusive holders of industrial power for an indefinite time. He became a professor at the University of Paris X-Nanterre and co-ordinated the reconstitution of annual indexes of agricultural production in various representative French territories (Alsace, Beauce, Champagne, Languedoc, Maine, Vaucluse)¹⁰ and of regional agricultural and industrial products (Champagne, Alsace)¹¹. Research on regional production agricultural indexes revealed the unsuspected depth of the grain farming and proto-industry crisis throughout the northern half of the Paris Basin after 1860¹² and the resilience of various regions of intensive agriculture (Alsace, Vaucluse) to the crises of the 1880¹³s.

Insofar as the services sector was, until the middle of the twentieth century, highly dependent on the development of the agricultural and industrial product (in other words, the physical product), the evolution of the physical product could be regarded as an approximation of that of the regional gross domestic product. The analysis of regional reality by quantitative methods gave results with a precision far superior to those hitherto achieved by historians or geographers investigating the evolutions of French space.

The study of the evolution of the agricultural and industrial product in Champagne and Alsace revealed the extent of the disparities in growth between two regions of early industrialization, Alsace and Champagne. Both had lacked local coal resources, both were part of precociously literate France and both had found remunerative industrial specializations. But Alsace had experienced a stronger growth, albeit interrupted by the exodus of population which had followed the annexation of 1871. The main explanation of this vigorous economic dynamism was that Alsace had suffered, at the beginning of the nineteenth century, a strong increase in its demographic pressure, in a context of critical rural overpopulation¹⁴. The existence of employer's families capable of passing on the entrepreneurial spirit on several generations also seemed as a factor of dynamism of alsacian territory¹⁵. The investigation undertaken by the *Institut d'Histoire moderne et contemporaine* on the employers of the Second Empire confirmed the diversity of the behavior of French industrialists among regions and the influence of these differences on the regional growth rates. To entrepreneurs families of Alsace and North, which considered industry as an aim in itself, opposed those of Normandy, which considered it as a stage in an upward social mobility¹⁶.

The comparison of the production indexes also revealed the unsuspected magnitude of the

¹⁰ Marc Auffret, Michel Hau et Maurice Lévy-Leboyer, "Les inégalités régionales de croissance dans l'agriculture française, 1823-1939, essai d'analyse économétrique", in *Seventh Economic History Congress*, Lewis Reprints, 1978, et "Regional Growth Inequalities in French Agriculture, 1823-1975", in P. Bairoch et M. Lévy-Leboyer, *Economic Disparities since the industrial Revolution*, St Martin's Press, New-York 1981. Michel Hau, « La résistance des régions d'agriculture intensive aux crises de la fin du XIXe siècle: les cas de l'Alsace, du Vaucluse et du Bas-Languedoc », *Economie Rurale* 1988. Voir également : Emmanuel Chadeau, *L'économie nationale aux XIXe et XXe siècles*, Paris, Presses de l'École Normale Supérieure, 1989.

¹¹ Michel Hau, *La croissance économique de la Champagne, 1810-1969*, Strasbourg, Presses Universitaires de Strasbourg, 1976; *L'industrialisation de l'Alsace 1803-1939*, Strasbourg, Presses Universitaires de Strasbourg, 1987; *La croissance économique de la Champagne* (new edition), Saarbrücken, Éditions Universitaires Européennes, 2015. See also the construction by Marc Wolff of an annual index of industrial production of the Nord, but his calculation method dont make possible to compare his index with those we have constructed. Cf. Marc Wolf, "Éléments pour la construction d'un indice de la production industrielle dans le Nord, 1814-1914", *Revue du Nord* n° 54, 1972, p. 289-315.

¹² Maurice Lévy-Leboyer, "Les inégalités interrégionales de revenu dans l'agriculture: leur évolution au XIXe siècle", *Économie rurale*, 152 (1982), p. 26-33.

¹³ Michel Hau, « La résistance des régions d'agriculture intensive aux crises de la fin du XIXe siècle : les cas de l'Alsace, du Vaucluse et du Bas-Languedoc », *Economie Rurale*, n° 184-186, mars-août 1988, p. 31-41.

¹⁴ Michel et Nicole Hau, « La croissance du produit agricole alsacien, 1815-1975 », *Revue d'Alsace*, 1981. Jean-Michel Boehler, "Economie agraire et société rurale dans la plaine de Basse Alsace aux XVIIe et XVIIIe siècles : l'amorce des mutations", in: J. M. Boehler et al. (eds), *Histoire de l'Alsace rurale*, Strasbourg, Istra, 1983, p. 210. Nicolas Stoskopf, *La petite industrie dans le Bas-Rhin*, Strasbourg, Oberlin, 1987. Michel Hau, « Pauvreté rurale et dynamisme économique : le cas de l'Alsace », *Histoire Économie et Société* 1987, p. 113 - 138. J.-M. Boehler, *Une société rurale en milieu rhénan: la paysannerie de la plaine d'Alsace (1648-1789)*, Strasbourg: Presses Universitaires de Strasbourg, 1994, p. 598. Jean-Michel Selig, *Malnutrition et développement économique dans l'Alsace du XIXe siècle*, Strasbourg, Presses Universitaires de Strasbourg, 1996. Cf. Laurent Heyberger, *Santé et développement économique en France au XIXe siècle. Essai d'histoire anthropométrique*, Paris, L'Harmattan, 2003. Laurent Heyberger, *La révolution des corps. Décroissance et croissance staturale des habitants des villes et des campagnes en France, 1780-1940*, Strasbourg-Belfort, Presses Universitaires de Strasbourg, Pôle éditorial multimédia de l'UTBM, 2005. Michel Hau et Karim Djedid, « Stature et malnutrition dans l'Alsace de la première moitié du XIXe siècle », *Histoire Économie et Société*, mars 2009, p. 35-56.

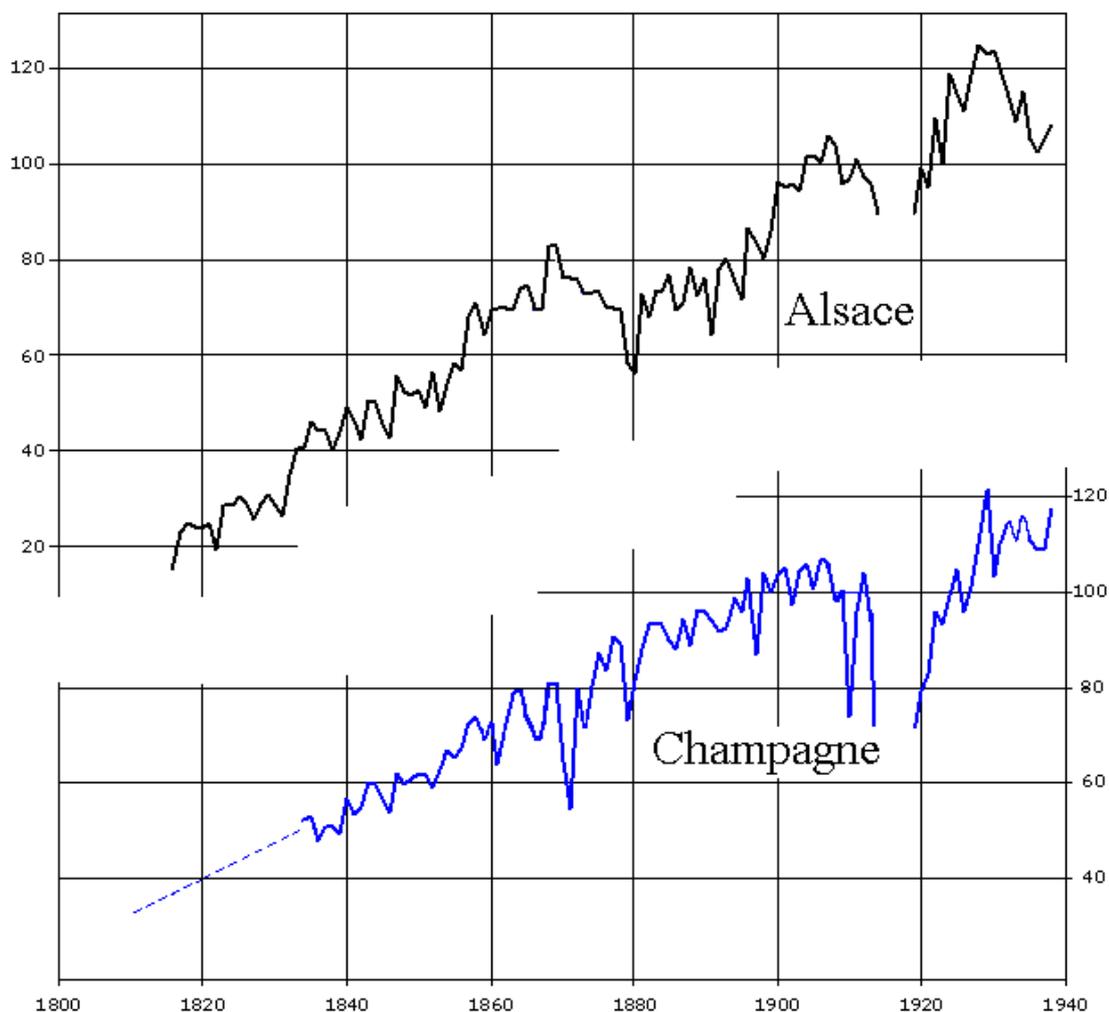
¹⁵ Michel Hau et Nicolas Stoskopf, *Les dynasties industrielles alsaciennes*, Paris, Perrin, 2005.

¹⁶ Dominique Barjot, *Patrons du Second Empire*, 11 vol., Paris, Picard / Cénomane, 1991-2010. Dominique Barjot (dir.), *1. Normandie-Maine-Anjou*, 1991 ; Philippe Jobert, (dir.), *2. Bourgogne*, 1991 ; Jean-Luc Mayaud, *3. Franche-Comté*, 1991 ; Nicolas Stoskopf, *4. Alsace*, 1994 ; Roland Caty, Éliane Richard et Pierre Échinard, *5. Marseille*, 1999 ; Hubert Bonin, *6. Bordeaux et la Gironde*, 1999 ; Nicolas Stoskopf, *7. Banquiers et financiers parisiens*, 2003 ; Gracia Dorel-Ferré et Denis McKee (dir.), *8. Champagne-Ardenne*, 2006 ; Pierre Cayez et Serge Chassagne, *9. Lyon et le Lyonnais*, 2006 ; Jean-Marie Wiscart, *10. Picardie*, 2007 ; Gérard-Michel Thermeau, *11. Loire – Saint-Étienne*, 2010. Hors collection : Frédéric Barbier (dir.), *Le Patronat du Nord sous le Second Empire, une approche prosopographique*, Paris-Geneva, Droz, 1989 ; Dominique Barjot, Éric Anceau, Isabelle Lescent-Giles, Bruno Marnot, *Les entrepreneurs du Second Empire*, Paris, Presses de l'université de Paris-Sorbonne, 2003.

economic deceleration suffered by Champagne since the 1880s, caused by the attraction of the neighbouring Paris conurbation (Ile-de-France) to its workforce and its capital¹⁷.

¹⁷ Michel Hau, « La comparaison des croissances économiques de deux régions industrielles, la Champagne et l'Alsace (1810-1939) », *Histoire Économie et Société* 1989, pp. 459 - 467.

Figure 1
Comparative growths of the regions Champagne and Alsace
(agricultural and industrial product, base 1908-1912 = 100)



Sources: Michel Hau, *L'industrialisation de l'Alsace (1803-1939)*, Strasbourg, Presses Universitaires de Strasbourg, 1987, p. 460. Michel Hau, *La croissance économique de la Champagne de 1810 à 1969*, Saarbrücken, Éditions universitaires européennes, 2015, p. 219-220.

Labour Force Censuses

At the same time, an economist, Michel Quélenec, pursued the same objectives, using labour force censuses. Based on these figures, he assessed the economic potentials of the French regions between 1864 and 1970¹⁸ at several key dates. While confirming the opposition between the north and the south of the Saint-Malo-Genève line, he showed that the developed part of France at the time of Napoleon III was extended by the Rhone valley to the Mediterranean coast.

But, from the 1860s, the French territory had experienced a new distribution of economic power between regions characterized by:

- a concentration in four regions (Île-de-France, Rhône-Alpes, Nord-Pas-de-Calais and Provence);
- a relative regression of regions bordering the Ile-de-France (Picardie, Champagne, Centre, Haute and Basse Normandie);
- a sharp deindustrialisation of Languedoc and Basse-Normandie.

¹⁸ Michel Quélenec, *Analyse structurale du développement économique des régions françaises (1864-1970)*, Th. Droit, Panthéon-Sorbonne, 1972.

Michel Quélenec provided researchers with tools to analyze the relationships between strong and weak regions. In the domination effect that the former exerted on the latter, he distinguished:

- the effects of "progressive" domination (the processes of stimulating and of over spilling)
- the effects of "regressive" domination (the processes of destructuring).

He also proposed a way of decomposing the regional economic growth rate. Its analysis was based on a distinction between

- the "growth base", a sector whose outlets crossed regional borders,
- the "residential sector", a sector geared towards meeting local needs.

It was the development of the growth base that had a stimulating effect on the residential sector, through a multiplier of regional employment. A shorter period, between the industrial active population censuses of 1866 and 1906, confirmed, at the end of the 19th century, the relative decline of the Paris Basin crown and the concentration of industry on the Paris agglomeration, the Nord-Pas-de-Calais, the Lorraine and the Saint-Etienne region. It also showed that the regions, which, like those in the southern half of the Paris Basin, had ample reserves of agricultural population had a higher economic dynamism than those of the northern half, which had been subject to the Parisian attraction and to the rural exodus for a longer period of time. This study revealed the decisive influence exerted by the labour market and the demographic phenomena on the distribution of industries¹⁹.

Business demography

In the 1980s, Philippe Jobert and Jean-Claude Chevaller proposed a new way to improve the knowledge of disparities in regional growth. They used a different method of comparing, from the series extracted from the General Account of Civil and Commercial Justice, the pace of business creations and bankruptcies²⁰ between 1840 and 1913. The relationship between creations and bankruptcies, by department on a ten-years basis, was an indicator sensitive to changes in economic dynamism over time and space.

The obtained image was affected by several biases, due to the absence of distinction between industrial and commercial enterprises, the large number of small enterprises without real economic weight and the asymmetry between the series of creations, concerning only companies, and that of bankruptcies, concerning all enterprises. Economist historian Nicolas Stoskopf pointed out that many enterprises did not take the form of companies. Thus, the Pereires, usually presented as paragons of entrepreneurs, had long remained "employees" and had never created in Paris a company under the name "Pereire Frères". The decline in the number of companies could also reveal a process of financial concentration and modernization²¹. Nevertheless, the images obtained confirmed and complemented those obtained in other approaches to regional quantitative history.

In a session of the International Economic History Congress in Madrid in August 1998 devoted to the processes of deindustrialisation, Jean-Claude Chevaller pointed out that between 1840 and 1913, the creation of companies had tended to concentrate in the "strong regions" distinguished by Michel Quélenec (notably the départements of the Seine and the Nord and, more moderately, that of the Rhône), while bankruptcies were more uniformly spread throughout the national territory, with a particular intensity at the south-west of the famous line Saint-Malo-Geneva²². The result was a growing contrast between the north-eastern half of France, where

¹⁹ Michel Hau, "La nouvelle géographie industrielle", in: M. Lévy-Leboyer (dir.), *Histoire de la France industrielle*, Paris, Larousse, 1996, p. 214-229.

²⁰ Philippe Jobert et Jean-Claude Chevaller, "La démographie des entreprises en France au XIXe siècle. Quelques pistes", *Histoire, Economie et Société*, 2, 1986, p. 233-264. Philippe Jobert, *Les entreprises aux XIXe et XXe siècles, Annuaire statistique de l'économie française aux XIXe et XXe siècles*, vol. 3, Paris, Presses de l'E.N.S., 1991. Jean-Claude Chevaller, "La démographie des entreprises dans les départements français au XIXe siècle", in: M. Moss et P. Jobert (eds), *Naissance et mort des entreprises en Europe, XIXe et XXe siècles*, Dijon, Université de Bourgogne, 1995, p. 125-139. Philippe Jobert, "Leçons des chiffres : le compte général de l'administration de la justice civile et commerciale au XIXe siècle" in: Michèle Merger (éd.), *Les entreprises et leurs réseaux : hommes, capitaux, techniques et pouvoirs, XIXe-XXe siècles. Mélanges en l'honneur de François Caron*, Paris, Presses de l'Université de la Sorbonne, 1998, p. 67-82.

²¹ Nicolas Stoskopf, *Le défi économique ou comment sortir de l'ordinaire ?* Mémoire HDR, Université de Paris-Sorbonne, 2002, note 176, p. 73 on line on Hal-SHS.

²² Jean-Claude Chevaller, "Désindustrialisation et démographie des entreprises en France au XIXe", in: Michel Hau et Clara Nunez (eds.), *De-industrialisation in Europe, 19th-20th centuries, B11 Proceedings Twelfth International Economic History Congress Madrid, 1998*, Sevilla,

creations outweighed, decade after decade, bankruptcies, and the south-western half where the reverse situation prevailed.

As well as Michel Quélenec, Philippe Jobert and Jean-Claude Chevailler noted the contrast between the rapid economic development of the department of the Seine and the gradual erasure of the regions around the Paris Basin after 1860. They also found that the Mediterranean and Atlantic coasts were particularly affected by corporate bankruptcies between the 1870s and the First World War.

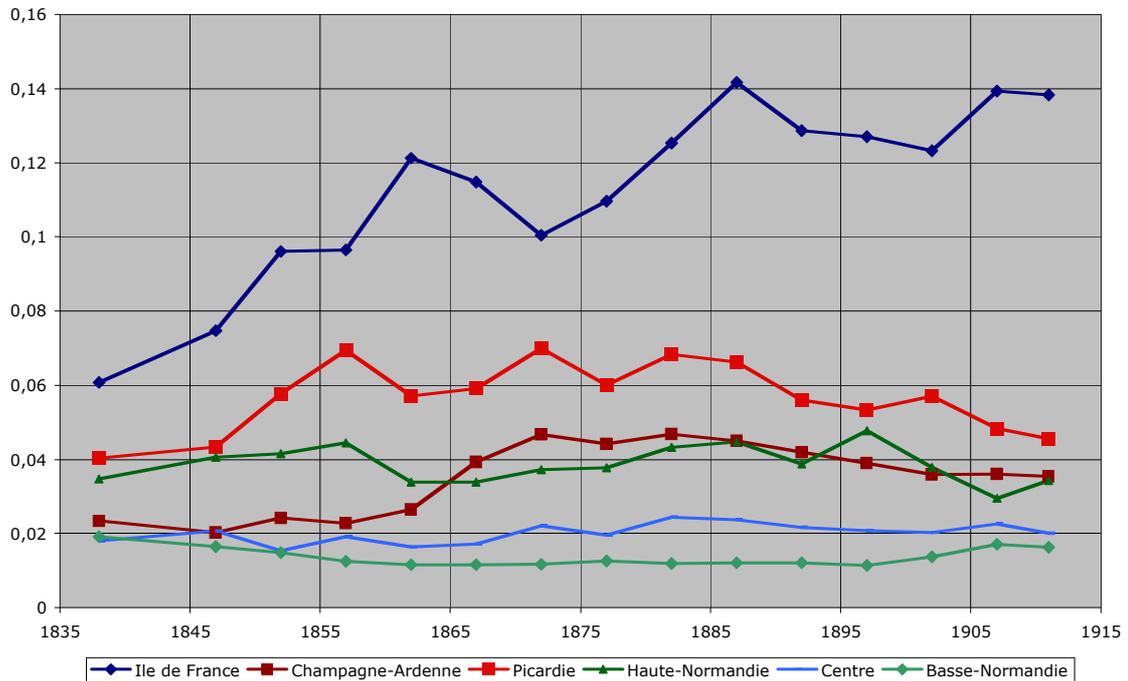
The departmental consumption of coal

Another way of approaching the disparities in regional growth was possible thanks to the departmental figures of coal consumption given by the statistics of mineral industry. The study of these figures²³ gave another picture of the evolution of regional economic disparities. Certainly, it was biased: until late in the 19th century, coal was also used for domestic heating and watercourses continued to contribute significantly to the energy balance of industries in many French regions. Nevertheless, the image of disparities in regional growth built on the consumption of coal was, with a few minor exceptions, convergent with Michel Quellénec's analyzes: it revealed a process of geographical concentration of industry in France for the benefit of three regions, Ile-de-France, Nord-Pas-de-Calais and Lorraine. It also confirmed the relative stagnation from 1860, and then the decline in the 1880's, of all the regions around the Parisian Basin.

Fundación Fomento de la Historia Económica, 1998, p. 67-81.

²³ Service des Mines, *Compte rendu des travaux des ingénieurs des Mines*, 1834-1846; *Statistique de l'industrie minière*, 1847 et seq. Michel Hau, "Coûts du transport du charbon et industrialisation des régions françaises de 1847 à 1911", in : Association interuniversitaire de l'Est, *Transports et voies de communication*, Dijon, Société des Belles Lettres 1977 ; "Energiekosten und Industrialisierung der französischen Regionen von der Mitte des XIX. Jahrhunderts bis zum 1. Weltkrieg", in S. Pollard, *Region und Industrialisierung*, Vandenhoeck u. Ruprecht, Göttingen 1980, p. 239-253.

Figure 2
 Percentages of Ile de France and other regions around the Parisian Basin
 in the national consumption of coal

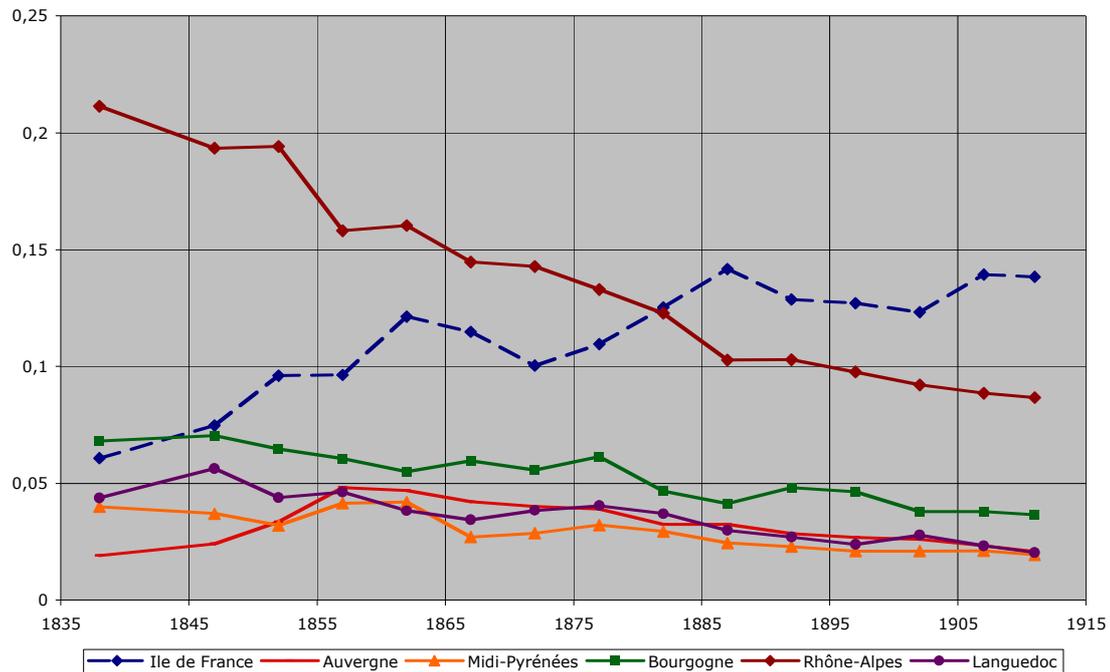


Source: Statistique de l'industrie minérale, 1838-1911.

With regard to Michel Quélenec's analyses based on the censuses of population, this study put more the accent on the weakening, since the 1840s for Rhône-Alpes, then, since the crisis of 1847, for the Burgundy and Languedoc, and finally since the crisis of 1857, for the whole zone extending from Burgundy to Mediterranean coast. The study of the costs of transport and extraction allowed to attribute a part of this decline to the decrease of the relative advantage that established the presence of local resources of coal with regard to the regions of Paris Basin and Alsace. But the prices of the coal had remained lower than in these regions, what tended to prove that other factors had disadvantaged the French Southeast in the interregional competition²⁴.

²⁴ Michel Hau, "Energiekosten...", loc. cit., p. 246.

Figure 3
Percentages of Ile de France and regions of French Southeast
in the national consumption of coal



Source: Statistique de l'industrie minérale, 1838-1911.

The relaunching of the study of regional growth by anthropometric history

The history of regional growth disparities underwent a sudden renewal in France from 2003, with the works of Laurent Heyberger²⁵. Inspired by the pioneering work of Emmanuel Le Roy Ladurie²⁶ on the health status of French conscripts and the methods developed by the new anthropometric history²⁷, they relied on the study of the average stature of conscripts²⁸. These data were perfectly preserved in the military series of the French departmental archives centers. It is now recognised that the average stature is an indicator of the standard of living of the population. Corrections were nevertheless to be made to this new representation of disparities in regional growth: urban dwellers at the beginning of the industrial revolution were generally less well-nourished than rural ones, because of the cost of supplies (which only decreased significantly with the advent of the railway and, then, refrigerated wagons). However, in France, this "urban penalty" was less pronounced than in other countries²⁹. The image of regional development revealed by the study of the average stature of conscripts was affected by another bias, the greater or lesser openness of the countryside to urban markets: on an equal income, the average Norman stature was diminished by exports of dairy products to Paris, while the inhabitants of Burgundy and Franche-Comté, who were more self-consuming, were higher.

At the beginning of the nineteenth century, the departmental distribution of statures showed a France divided into two halves on either side of the Saint-Malo-Genève line: the small statures in

²⁵ Cf. Laurent Heyberger, *Santé et développement économique en France au XIXe siècle. Essai d'histoire anthropométrique*, Paris, L'Harmattan, 2003. Laurent Heyberger, *La révolution des corps. Décroissance et croissance staturale des habitants des villes et des campagnes en France, 1780-1940*, Strasbourg-Belfort, Presses Universitaires de Strasbourg, Pôle éditorial multimédia de l'UTBM, 2005.

²⁶ Nicole Bernageau, Emmanuel Le Roy Ladurie, Yves Pasquet « Le conscrit et l'ordinateur. Perspectives de recherche sur les archives militaires du XIX^e siècle français », *Studi Storici*, 10 : 1969, p. 260-308. Jean-Paul Aron, Paul Dumont, Emmanuel Le Roy Ladurie, *Anthropologie du conscrit français d'après les comptes numériques et sommaires du recrutement de l'armée (1819-1826)*, Paris, Mouton, 1972.

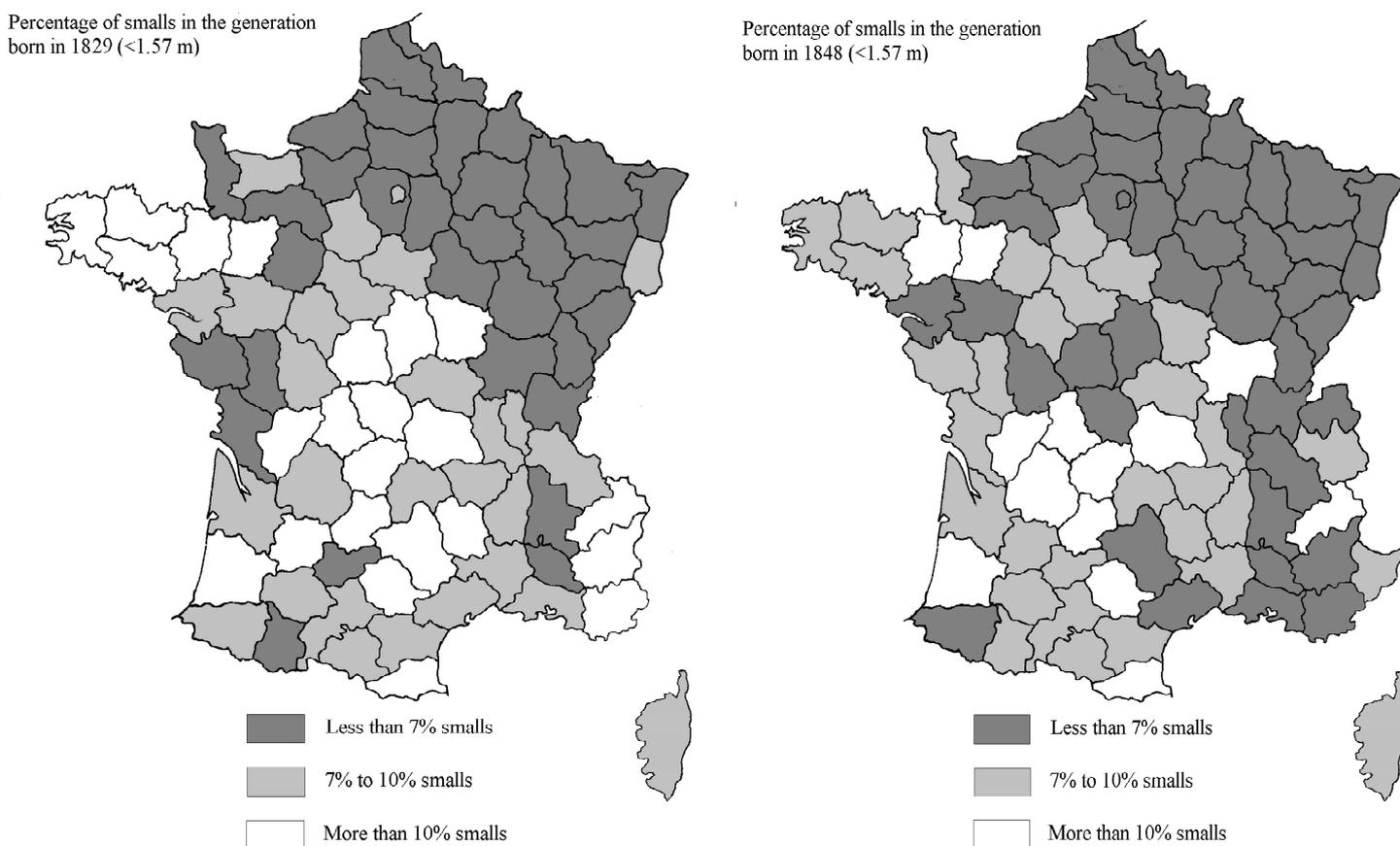
²⁷ John Komlos, *The Biological Standard of Living in Europe and America, 1700-1900*, Variorum, Aldershot 1984. Stanley L. Engerman "The Standard of Living Debate in International Perspective: Measures and Indicators", dans Richard H. Steckel, Roderick Floud (dir.), *Health and Welfare during Industrialization*, University of Chicago Press, Chicago, 1997, p. 17-46.

²⁸ Laurent Heyberger, *L'histoire anthropométrique*, Berne, Peter Lang, 2011.

²⁹ Laurent Heyberger, "Les Parisiens et les banlieusards étaient-ils aussi grands que cela? "Stature, nutrition et urbanisation en France au milieu du XIXe siècle", *Annales de démographie historique* 2013, n° 2, p. 113-140. Laurent Heyberger, "Received wisdom versus reality: Height, nutrition and urbanization in mid-nineteenth century France", *Cliometrica*, vol. 8-1, 2014, p. 114-140.

the South-West and the largest in the North-East. It could be seen that during the following decades, the south-western part was catching up with the north-eastern part, first descending the Rhone axis and then, towards the South, from the regions of the left bank of the Loire³⁰. Generations born in the middle of the nineteenth century experienced, in the plains of the North of the Parisian Basin, a plateau in their statural growth. There was again the crisis of the proto-industry of the Paris Basin that had already been described by Maurice Lévy-Leboyer³¹.

Figure 4
 Departemental inequalities of stature distribution between conscripts born in 1829 and 1848



Prospects

There is now a renewed interest in space econometrics. At the present time, the researches are resumed by economists. Using data from the mineral industry statistics, Claude Diebolt launched in 2016 a survey on steam engines and crossed the data obtained with those already collected on schooling. He introduced a disaggregated human capital perspective, distinguishing between basic human capital (primary school) and intermediate human capital (post-elementary instruction). The conclusion was that the steam technology led to intermediate human capital accumulation in France during the second half of the XIXth century.

³⁰ Laurent Heyberger, *Santé et développement économique en France*, op. cit., p. 85-86.

³¹ Maurice Lévy-Leboyer, "Les inégalités régionales : évolution au XIXe siècle", *Économie rurale*, loc. cit., p. 26.

The works on regional aggregates can be repeated on the remaining regions: we now have the methods to continue this type of research in the rest of France and we know the available data.

Tax data can also be used. In Germany, the oldness of the income tax had enabled Knut Borchardt to establish from the 1870s series on the evolution of per capita income in each region and to update a gradient in the living standard when traveling from East to West³². On this model, income tax data can also be used for France since the 1920s³³ and give a fairly reliable picture of the disparities in regional growth. However, no exhaustive study was carried out throughout the territory and throughout the period.

Data on wages, as well as on property and business income, can yield interesting results, because they add to the physical product that of services. The survey carried out by Nicole Delefortrie and Janine Morice shows the way³⁴. It covered the years 1864 and 1954. It revealed the abundance of the data available in the publications of the various French administrations³⁵ and the possibility of carrying out similar studies for other years of the nineteenth and twentieth centuries.

Several interesting facts have been established. First, the spatial stability, until 1954, of the difference between the two unequally developed parts of France: in 1954, the north-eastern part of France accounted, as in 1864, for an average disposable income per capita higher than the south-western part³⁶. Then, the survey revealed the continuation, until the aftermath of the Second World War, of the large extent of the departmental disparities in the average income of farmers. This phenomenon was specific to agricultural income: technological progress had not yet made it possible, as far back as 1954, for the poorer regions to catch up with the rich regions. The pattern of tenure, the size of farms and, more generally, the problem of structures, had delayed the spread of technical progress³⁷. Finally, as opposed to differences in agricultural income, regional differences in wages between 1864 and 1954 considerably decreased³⁸.

This alleviation of wage disparities between French regions appears to have been the consequence of interdepartmental population movements. These migrations were particularly intense in the départements close to the Paris conurbation. The economist Louis M. Goreux showed that they were the inverse function of the square of the distance to Paris³⁹. Comparing the net migration rates between the 1866 and 1954 censuses with the disposable income per capita in 1864, the study by Nicole Delefortrie and Janine Morice shows a positive correlation between these two variables⁴⁰.

Before commissioning of the railways, the workers' wages of the towns were significantly correlated with the average farm incomes of their department. We published in 1987 an article in the review *Histoire, Économie et Société*⁴¹. Based on the investigations of 1852 on agriculture and of 1853 on urban wages in small industry⁴², it revealed the income disparities of farmers and industrial workers throughout the départements in XIXth century France. On one hand, it showed the amplitude of the contrasts between the départements: even without considering the département of Seine, where the level of wages was much higher than in province, the real wages (nominal wages deflated from prices of wheat) in small industry varied from the index 67.1 for the Côtes du Nord to the index 156.6 for the Bouches-du-Rhône, with a scale factor of 2.3. If we tried to correct the size effect of the urban area, the scale factor was 2.1 between the Côtes du Nord (index 66.7) and the Seine-et-Oise (index 143.3)⁴³. Inequalities were much bigger regarding the agricultural income per

³² Knut Borchardt, "Regionale Wachstumsdifferenzierung in Deutschland im 19. Jahrhundert unter besonderen Berücksichtigung des Ost-West Gefälles", in Friedrich Lütge (éd.), *Wirtschaftliche und soziale Probleme der gewerblichen Entwicklung im 15.-16. und 19. Jahrhundert*, Stuttgart 1968, pp. 115-130.

³³ Ministère des Finances, *Renseignements relatifs aux impôts directs*, années 1920 et suiv

³⁴ Nicole Delefortrie et Janine Morice, *Les revenus départementaux en 1864 et 1954*, Paris, Armand Colin, 1959, p. 193 à 231.

³⁵ N. Delefortrie, J. Morice, op. cit., p. 177-178.

³⁶ N. Delefortrie, J. Morice, op. cit., p. 67 et 121.

³⁷ N. Delefortrie, J. Morice, op. cit., p. 152.

³⁸ N. Delefortrie, J. Morice, op. cit., p. 160.

³⁹ L. M. Goreux, "Les migrations agricoles depuis un siècle et leurs relations avec certains facteurs économiques", *Études et Conjoncture* n° 4, 1956.

⁴⁰ N. Delefortrie, J. Morice, op. cit., p. 173.

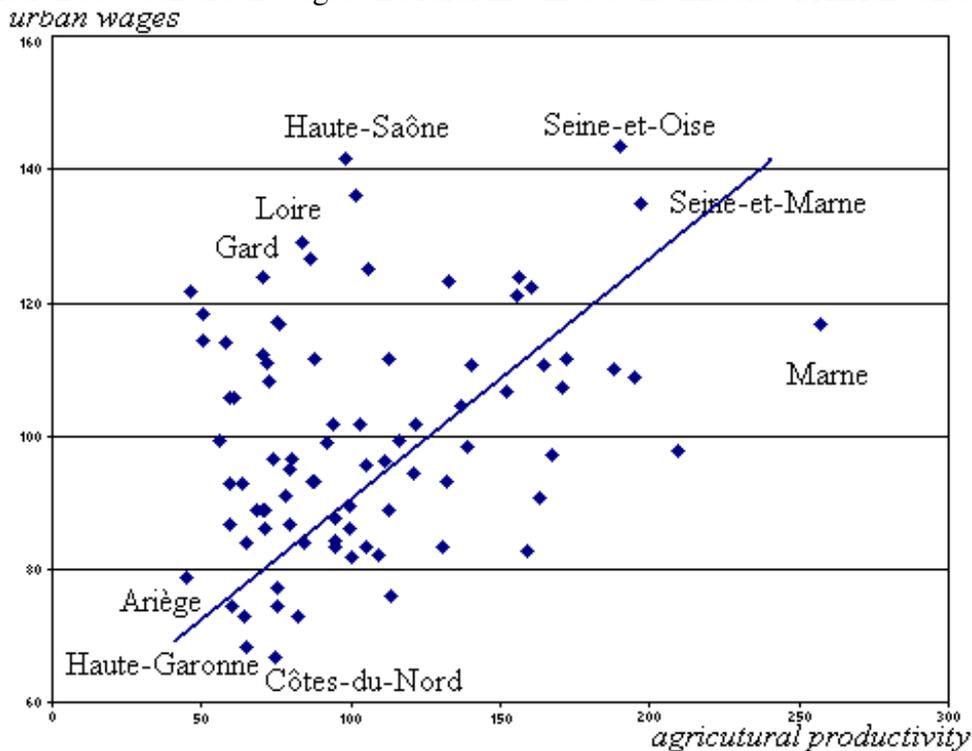
⁴¹ M. Hau, « Pauvreté rurale et dynamisme économique : le cas de l'Alsace », *Histoire, Économie et Société*, 6-1, 1987, p. 113-138.

⁴² « Enquête agricole de 1852 », *Statistique de la France*, 2^e série, t. VII, p. 318-343 et t. VIII, p. 396-423 ; « Salaires de la petite industrie (1853) », *Statistique de la France*, 2^e série, t. XII, p. 2-83.

⁴³ Real wages = arithmetic mean of the "salaires de la petite industrie relevés dans les chefs-lieux de département" in the investigation of 1853 deflated by "prix de l'hectolitre de froment" in the same towns and same years. Wages corrected from size variation of urban areas = index of nominal

farmer : the scale factor was 5.7 between the Ariège (index 44.9) and the Marne (index 257.4). On the other hand, at the middle of XIXth century, the inequalities of the urban wages between the french départements didn't reflect those of the prices of the wheat, as was believed before ; for example, in Alsace, wheat was expensive while the nominal wages were low. But the inequalities of wages of small industry were very significantly correlated with those of the sandard of living of the farmers (with a Fisher coefficient of 8.8 for 84 observations)⁴⁴. The conclusion was that the market of the labour force was geographically segmented. The level of urban wages was strongly dependent on the offer of the labour force coming from the neighbouring rural area.

Figure 5
Correlation between urban wages and rural incomes at the middle of XIXth century



The regional model of growth broke the model of internationally competitive economics as formulated by Raymond Courbis on an important point. Raymond Courbis postulated that the travels of workers from a territory to another were unimportant, so that the wage inequalities between the territories could remain.⁴⁵ This postulate of a few mobile population could not be admitted for regions included in a same national space, especially after the construction of the railway network. Directed from the poor départements to the the richer, these travels had caused a convergence of the urban wages. This was a reason why a snapshot of the french economic space taken just before the beginning of important interregional migrations was a very useful information.

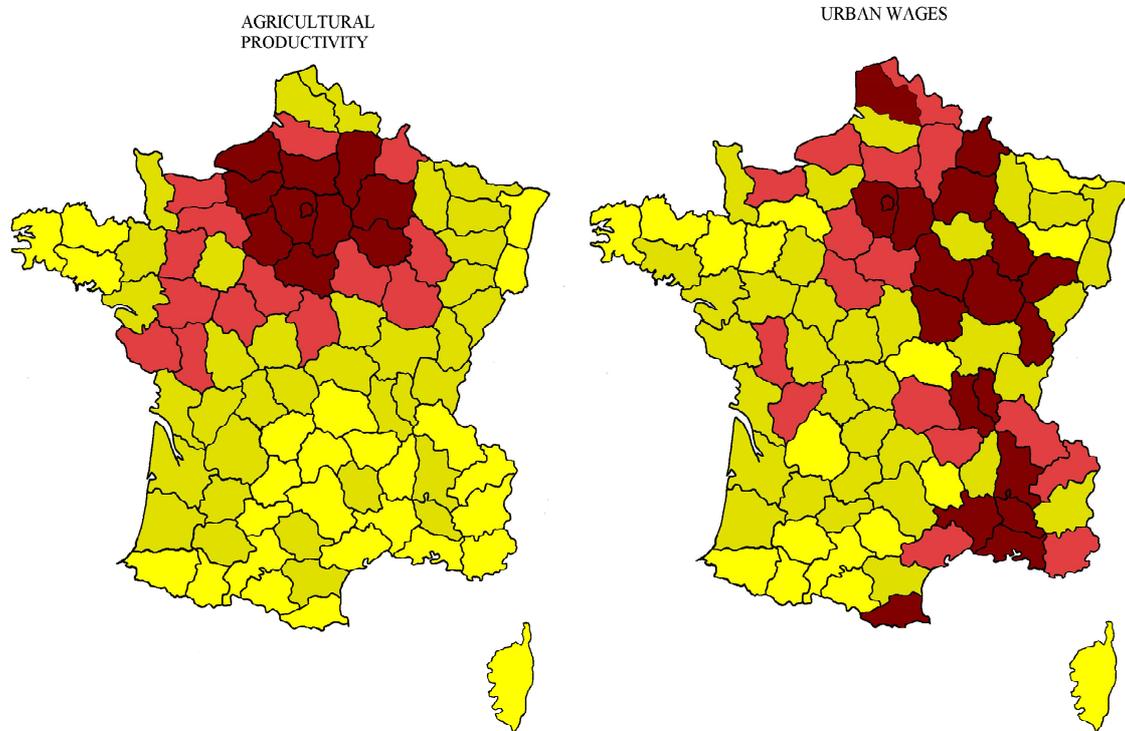
A positive residual was observed in 1853 for the urban wages along the Rhône Valley and the Mediterranean coastline : iron industry and vine growing pushed up the urban wages in these regions.

wage deflated by index of number of inhabitants of the "chef-lieu". It was not possible to consider in a same regression the disparities in wheat prices and the disparities in size of the urban areas, because the two variables are redundant. Cf. Ministère de l'Agriculture, *Tableau des récoltes de céréales et pommes de terre*, Paris, 1878, p. 179-183 ; M. Hau, « Pauvreté rurale et dynamisme économique ... », loc. cit., p. 137 and p. 138.

⁴⁴ A Fisher coefficient of 8.8 for 84 observations corresponds to a probability of null hypothesis of 0.4 % (*ibid.*, p. 136).

⁴⁵ Raymond Courbis, *La détermination de l'équilibre général en économie concurrentielle*, Paris, Éd. du CNRS, 1971, p. 14.

Figure 6
Disparities of agricultural productivity and disparities of urban wages



In 1990, the work of Michel Demonet, which used the data of the 1852 investigation on agriculture, described on the level of the arrondissement, with a high quality of resolution, the diversity of the living standards of the farmers in mid XIXth century France⁴⁶. Like M. Quélenec, while confirming the opposition between North-East and South-West, M. Demonet showed that developed France went on by the Rhône Valley up to the Mediterranean coastline⁴⁷. The zones of agricultural prosperity were the wheat producing area of the Paris Basin and the vineyards of Burgundy, Provence, Languedoc and Bordeaux region. His map of agricultural wages of 1852 looked like the one we had established for the industrial wages⁴⁸. This similarity between the two geographical distributions of urban and agricultural wage disparities confirmed the territorial segmentation of the labour market before the railroads revolution.

M. Demonet pointed out the discrepancy between agricultural production per farmer and agricultural production per hectare. He gave thereby yet more credibility to the thesis of a dominant influence of the demographic density on the living standard of the farmers in mid-19th century France⁴⁹. Despite the technical progress, the more the density was high, the more the living standard was low. The work of M. Demonet was not continued for the following agricultural investigations (1862, 1882, 1892, etc.). There are here beautiful perspectives for researchers who would be ready to apply his methods.

Other data, although very rich, proved to be less exploitable for the history of unequal economic growth between territories. The electoral lists of the censal monarchy studied by André-Jean Tudesq⁵⁰ make it possible to locate the most imposed Frenchmen geographically, but the maps

⁴⁶ Michel Demonet, *Tableau de l'agriculture française au milieu du 19^e siècle. L'enquête de 1852*, Paris, Éditions de l'EHESS, 1990.

⁴⁷ *Ibid.*, p. 144.

⁴⁸ M. Hau, « Pauvreté rurale et dynamisme économique ... », art. cit., p. 124-126 ; Demonet, *Tableau de l'agriculture française...*, *op. cit.*, p. 71.

⁴⁹ Demonet, *Tableau de l'agriculture française...*, *op. cit.*, p. 110.

⁵⁰ Jean-Anré Tudesq, *Les grands notables en France 1840-1849*, Paris, Presses Universitaires de France, 1964.

that stem from these analyzes reveal above all the concentration of land ownership and say little about the economic power and the per capita product in the various départements.

Bernard Lepetit's thesis on the urban framework of pre-industrial France showed that, apart from the spectacular retreat of the Atlantic harbour agglomerations, the geography of French cities did not much differ under Louis Philippe from what it was under Louis XV: The urbanisation rate of the regions depended very much on the population density, the grouped nature of the habitat and the presence of the administrations⁵¹. However, the comparison between demographic ranking and economic ranking of the cities provided a relatively reliable indication of levels of development. It showed the advance of the northern half of the Paris Basin and the north-eastern edge of France⁵², without making it possible to assess the living standards of the rural population.

The study of the summary tables of the patents reproduced in the third volume of the *Annuaire statistique de l'économie française*⁵³ also gives interesting indications on the industrial and commercial potential of each department. Although it does not allow the creation of continuous annual series, it opens interesting research perspectives⁵⁴.

The determination, with increasing precision, of the rhythms of development of the various regions within the same national territory facilitates the study of the factors of growth disparities. Through further analysis of production movements, the detection of correlations with other economic, demographic or sociological variables becomes more efficient. A better sensitivity of the fundamental indicators of the dynamism of the regions makes it possible to determine more precisely what makes that a territory is more or less attractive, that firms are more or less competitive and that they succeed in creating more or less jobs.

Interest for this type of analysis is now gaining in intensity. Since the end of the 1980s, after a decade of deindustrialisation and rising unemployment in France, it has been noticed that, despite state aid, regional development policy has not succeeded in halting the rise of unemployment in the old industrial basins⁵⁵ or even to save the industries resulting from the decentralizations of the 1960s. It was surprising to note that peripheral territories in Savoie, Vendée, northern Alsace or Jura, resisted the economic decline⁵⁶. They had in common to house, in small spaces, constellations of small and medium-sized family enterprises operating in the same specialties and maintaining cooperative relations with each other⁵⁷. The industrial district concept, also known as the "local productive system", was applied by researchers to other regions of Europe, most of them located in the Rhine-Alpine heart of Europe⁵⁸.

French economist historians decided to take a closer look at these territories, where industrial activity seemed to benefit from an exceptionally favourable micro-climate. Several symposia were organized at the junction between regional history, industrial history and history of enterprises⁵⁹. These works showed that the dynamism of the industrial districts was based above all

⁵¹ Bernard Lepetit, *Les villes dans la France moderne (1740-1840)*, Paris, Albin Michel, 1988, p. 41 et 149.

⁵² Bernard Lepetit, op. cit., p. 30-32 et 169.

⁵³ Philippe Jobert (éd.), *Les entreprises aux XIXe et XXe siècles, Annuaire statistique de l'économie française aux XIXe et XXe siècles*, vol. 3, Paris, Presses de l'ENS, 1991, p. 25-85.

⁵⁴ Pierre Lévêque, "La patente, indicateur de de croissance différentielle au XIXe siècle", in: François Caron (éd.), *Entreprises et entrepreneurs*, Paris, Presses Universitaires de l'Université de Paris-Sorbonne, 1983 p. 36-73.

⁵⁵ Dominique Barjot, "Préface", in: Patrice Caro, Olivier Dard et Jean-Claude Daumas, *La politique d'aménagement du territoire. Racines, logiques et résultats*, Rennes, Presses Universitaires de Rennes, 2002, p. 12.

⁵⁶ Cf. M.J. Piore et C.F. Sabel, *Les chemins de la prospérité*, Paris Hachette 1989.

⁵⁷ This phenomenon had been described one century before by the English economist Alfred Marshall who qualified this type of territory " industrial district ". These words were again used in 1977 by Arnaldo Bagnasco and Giacomo Becattini to describe the industry of north-eastern and central Italy. Cf. A. Bagnasco, *Tre Italia. La problematica del sviluppo italiano*, Bologna, Il Mulino, 1977. A. Bagnasco, C. Trigilia, « *La construction sociale du marché* », *Le défi de la Troisième Italie*, Cachan, Ed. de l'ENS, 1988. G. Becattini, « Le district marshallien : une notion socio-économique », in : Georges Benko, Alain Lipietz, *Les régions qui gagnent. Districts et réseaux: les nouveaux paradigmes de la géographie industrielle*, Paris, Presses Universitaires de France, 1992, p. 36.

⁵⁸ G. Herrigel, *Industrial Constructions : The Sources of German Industrial Power*, Cambridge University Press, Cambridge, 1996. Nuria Narvaiza-Mandon, *Analyse régionale du chômage en Europe occidentale, 1973-2009*, Belfort et Neuchâtel, Pôle éditorial multimédia de l'UTBM et éditions Alphil, 2011, p. 176-177.

⁵⁹ The colloquium *Villes et districts industriels en Europe occidentale* was organized at Tours on the 7th and 8th december 2000 under the direction of Jean-François Eck and Michel Lescure. Cf. Jean-François Eck and Michel Lescure (eds.), *Villes et districts industriels en Europe occidentale, XVII-XXe siècle*, Tours 2002. Michel Lescure organized on this topic a second colloquium on the 5th and 6th february 2004 at the ministère de l'Économie et des Finances. M. Lescure (ed.), *La mobilisation du territoire. Les districts industriels en Europe occidentale du XVIIe au XXe siècle*, Comité pour l'histoire économique et financière de la France, Paris 2006. Jean-Claude Daumas organized at Besançon a colloquium on the 27th-29th october 2004 on *Les territoires de l'industrie en Europe (1750-2000)*. Cf. J.-C. Daumas, « Dans la boîte noire des districts industriels », in : J.-C. Daumas, P. Lamard et L. Tissot, *Les territoires de l'industrie en Europe (1750-2000). Entreprises, régulations et trajectoires*, Presses Universitaires de Franche-

on "social values" shared by a whole milieu of wage-earners and local entrepreneurs⁶⁰.

Conclusion

It may seem frustrating for a researcher to have to make a large quantification effort without being able to develop equations where the economic growth of a territory would be explained by a reliable econometric model. Many explanatory variables are difficult to measure, such as those "social values" mentioned by historians like Michel Lescure⁶¹. Seeking to overcome this difficulty by leaving aside non-quantifiable variables results in treating them as constants. But economists may be able to formalize more rigorously, in mathematical form, some of the conclusions so far written in prose by economist historians, or even to quantify variables that the latter had judged to be unmeasurable.

Anyway, the quantitative regional history has already firmly established some facts which can nourish reflection in economics. It showed the importance of literacy for the pace of industrialisation, opposing two parts of France from each side of the Saint-Malo-Geneva line. It revealed the agglomeration effect, describing how the Parisian agglomeration had, after the disappearance of the protections that constituted the high transport costs, exerted a powerful attraction on capital and labour at the expense of the other French regions, especially its neighbours around the Parisian Basin. It showed how the problems of rural overcrowding could, in certain situations, lead to an increase in economic dynamism rather than to violent conflicts. A century later, and in the same way, the economic unification of the world reinforces the polarization of industrial and tertiary activities in favour of some territories, like Silicon Valley or Hong Kong - Shenzhen.

This is why many decision-makers are beginning to take an interest in the problem of economic performance in areas without borders, as they have been for a long time in infra-national territories. Students who plan to move towards research in quantitative regional history and spatial econometrics can be assured that their work will respond fully to the questions of the present time.

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Comté, Besançon, 2007, p. 10. Jean-Claude Daumas continued with another colloquium at Neuchâtel on 11th and 12th January 2006 with Laurent Tissot, Francesco Garufo and Pierre Lamard: *Histoire de territoires Les territoires industriels en question XVIIIe-XXe siècles*. The papers discussed at à Neuchâtel were presented at a session of the international congress of economic history at Helsinki in August 2006. Cf. Daumas Jean-Claude, Garufo Francesco, Lamard Pierre et Tissot Laurent, *Histoires de territoires: les territoires industriels en question XVIIIe-XXe siècles*, Neuchâtel, Toulouse et Belfort, Alphil-Presses Universitaires Suisses, Méridiennes, Pôle éditorial multimédia de l'UTBM, 2010.

⁶⁰ Michel Lescure, "Introduction générale" in : Jean-François Eck et Michel Lescure (eds.), op. cit., p. 12. Studying the divergences between the dynamic and the depressed regions during last decades, historians et anthropologists found unexpected links between some cultural variables and some economic variables. Cf. Hervé Le Bras, Emmanuel Todd, *L'invention de la France : Atlas anthropologique et politique*, Paris, Gallimard, 2012. Hervé Le Bras, Emmanuel Todd, *Le mystère français*, Paris, Seuil, 2013, p. 107. Cf. Nuria Narvaiza-Mandon, op. cit., p. 183. The factor of family structures seems also to influence on economic growth. Cf. Emmanuel Todd, *L'invention de l'Europe*, Paris, Seuil, 1990, p. 29-66. Nuria Narvaiza-Mandon, *Analyse régionale du chômage en Europe occidentale, 1973-2009*, Belfort et Neuchâtel, Pôle éditorial multimédia de l'UTBM et éditions Alphil, 2011, p. 182.

⁶¹ M. Lescure (ed.), *La mobilisation du territoire. Les districts industriels en Europe occidentale du XVIIe au XXe siècle*, op. cit., p. 12..

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