Regional Economic Disparity and Dynamics, 1840-1914: a Comparison between France, Great Britain, Prussia, and Sweden

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1. *Introduction*

This essay aims at answering three questions. 1) How large were interregional economic gaps in the second half of the XIXth century and the beginning of the XXth? Were they widening or narrowing? 2) What degree of stability did regional systems display? 3) What degree of adaptation to changing economic conditions can be discerned in the systems? In particular, how sensitive was migration to variations in regional economic circumstances?[1]

The broadest study so far of long-run changes in regional economic inequality is that by J.G. Williamson.[2] For 24 nations

[1] The term 'region' is here used in a less restrictive sense than is implied by the geographers' concept of homogeneous regions. No assumption is made about the degree of homogeneity within the area concerned. MOKHTAR M. METWALLY and RODNEY C. JENSEN, "A Note on the Measurement of Regional Income Dispersion", *Economic Development and Cultural Change* 22 (1973), contend that it is necessary to take into account intraregional as well as interregional dispersion in order to describe regional inequality in a meaningful way. This approach would be extremely difficult to carry out on a nation-wide basis for the period considered here. For instance, practically no Swedish economic data are available on a spatial level between that of the parish and that of the county. The subsequent analysis employs the county as the unit of investigation in Britain and Sweden, and the *département* and *Bezirke* in the cases of France and Prussia, respectively.

[2] JEFFREY G. WILLIAMSON, "Regional Inequality and the Process of National Development: a Description of the Patterns", *Economic Development and Cultural Change* 13 (1965).

at various levels of development he analyzed regional per capita income data from the 1950's. For the XIXth century, regional dispersion in this sense was measured for the United States and France only. The main result was that regional income inequality over time — measured by the coefficient of variation (CV) — could be represented by an inverted U curve. In other words, regional disparity tended to rise during the early stage of the growth process and decline in a more advanced phase.

This paper compares regional economic processes in four countries — France, Great Britain, Prussia, and Sweden — between about 1840 and 1914. The choice of states was determined by availability of data and by the wish to compare the Swedish experience with those of some larger economies. For this relatively early period, per capita income cannot be used as a main indicator of regional inequality. Such data are often unavailable or of doubtful quality.[3] For similar reasons no attempt will be made to estimate regional productivity differences. Instead, data

[3] Per capita income data before 1900 are not available for Prussia and Sweden. The regional income estimates for Prussia by GERD HOHORST, *Wirtschaftswachstum und Bevölkerungsentwicklung in Preussen 1816 bis 1914* (New York: Arno, 1977), pp. 344-7, result in implausibly low CV's. This is probably due to the somewhat peculiar specification of the regression equation employed to estimate XIXth-century incomes from 1913 data. This contains two independent variables: the number of sheep and men per area unit, and the number of cattle per capita. The predictive power of the model is not impressive, resulting in an R^2 of .41 for 1913, and it seems hazardous to apply the same equation back to 1816. Moreover, his CV's were calculated on the basis of province level data, which gives a very small number of observations (between 9 and 13). See also note 11 below.

The estimate of French regional per capita income inequality in 1864, reported by Williamson, *op. cit.*, 29, and described as 'very suspect', is based on calculations by NICOLE DELEFORTRIE AND JANINE MORICE, *Les revenus départementaux en 1864 et en 1964* (Paris: Armand Colin, 1959), pp. 65-6. Their figures were arrived at through a long series of operations on data which must contain wide margins of error, such as incomes of farmers, revenues of capital, etc. The data on regional wages and real property values used in this paper should provide more direct and reliable indicators of interregional differentials. Further research trying to utilize the economic information in 19th-century official statistics on taxes and public finance would be useful in the analysis of regional economic development. Not enough work has been done to evaluate these sources.

concerning regional wages and real property values will be examined.

2. *Divergence or convergence?*

This section describes levels and trends of regional dispersion in wages and real per capita property values. Table 1 reports CV's (weighted by population) for regional nominal wages, in most cases referring to male agricultural workers or other unskilled labour; details are given in the listing of sources. It does not yet seem possible to carry out a cross-national comparison based on real wages. This crude way of measuring regional differentials probably underestimates the dispersion in *average* wages since urban and industrialized areas certainly had a larger share of earners of relatively high wages than less developed regions.

Three comments may be made on Table 1. First, wage differentials were consistently smallest in Britain and largest in France up to *c.* 1880; towards the end of the century, however, Sweden displayed the greatest interregional variation. Prussia assumed an intermediate position although she tended to be closer to Sweden and France than to Britain. Second, a general convergence tendency is noticeable in the last decades of the XIXth century (or, for Sweden, the first decade of the XIXth). British, French, and Prussian CV's were lower in 1900 than at any previous date. Regional inequality started to decline earliest in Britain and latest in Sweden with France and Prussia in similar positions in between; this of course corresponds to cross-national variations in general economic development and agrees well with the predictions of Williamson's model. Third, the evidence in favour of the inverted U hypothesis is not very impressive. The clearest positive case is France, where regional disparity reached a maximum c. 1860-80.[4] Although dispersion reached a peak about 1870 in

[4] See JEAN PAUTARD, *Les disparités régionales dans la croissance de l'agriculture française* (Paris: Gauthier-Villars, 1965), Ch. 1, and LOUIS-MARIE GOREUX, "Les migrations agricoles en France depuis un siècle et leur relation avec certains facteurs économiques", *Etudes et conjoncture* 11 (1956), for similar views.

TABLE 1

COEFFICIENT OF VARIATION FOR REGIONAL WAGES IN FRANCE, BRITAIN, PRUSSIA, AND SWEDEN, c. 1840-1910

Year (approx.)	France	Britain	Prussia	Sweden
1840	.22	.14	.19	.21
1850	.20		.20	
1860	.33	.13	.20	.19
1870		.14	.23	.20
1880	.34	.14	.22	.22
1890	.22		.17	.23
1900	.16	.10	.15	.24
1910	.15	.09	.17	.20

Sources: France: *Prix et salaires à diverses époques. Statistiques de la France, deuxième série*, 12 (Strasbourg, 1863), pp. 210-1 (1834/43, masons' wages); *Salaires et coût de l'existence à diverses époques jusq'en 1910* (Paris, 1911), pp. 25-6 (1853/57, 1901, 1911, workers' day wages, average for 34 professions); Louis-Marie Goreux, "Les migrations agricoles en France depuis un siècle et leur relation avec certains facteurs économiques," *Etudes et conjoncture* 11 (1956): 359-60 (1862, 1882, agricultural labourers). Britain: Arthur L. Bowley, *Wages in the United Kingdom in the Nineteenth Century* (Cambridge: Cambridge University Press, 1900), end table (1837, 1860, 1880, agricultural labourers; Wales not included); Arthur L. Bowley, "The Statistics of Wages in the United Kingdom during the Last Hundred Years I. Agricultural Wages. Scotland," *Journal of the Royal Statistical Society* 62 (1899): 141-2 (1834/45, 1860, 1880, agricultural labourers); E.H. Hunt, *Regional Wage Variations in Britain 1850-1914* (Oxford: Clarendon Press, 1973), pp. 62-3 (1867/70, 1898, 1907, agricultural labourers;Wales included). Prussia: Udo Eggert, "Die Bewegung der Holzpreise und Tagelohn-Sätze in den preussischen Staatsforsten von 1800 bis 1879," *Zeitschrift des Königlich Preussischen Statistischen Bureaus* 23 (1883): 7-43 (1840/49, 1850/59, 1860/69, 1870/74, 1875/79, day-workers in state-owned forests; Berlin not included); *Central-Blatt für das Deutsche Reich* 20 (1892) and 29 (1901) (general daily wage rates for unskilled workers; Berlin included); *Staatistisches Jahrbuch für den Preussischen Staat* 12 (1914) (Berlin, 1915), p. 197 (1912, workers in state-owned forests; Berlin not included). Sweden: *Underdånigt betänkande angående Sveriges ekonomiska och finansiela utveckling under åren 1834-1860* (Stockholm, 1863), pp. cxiii-cxiv (1834, 1858, general daily wage rate); Lennart Jörberg, *A History of Prices in Sweden*, 1 (Lund: Gleerup, 1972), pp. 598-603 (1870-1910, agricultural labourers), supplemented by *Wages in Sweden 1860-1930*, 2 (London: P.S. King & Son, 1935), p. 55 (1870-1910, unskilled municipal workers in Stockholm).

Note. In order to obtain comparability over time in this table and in the subsequent analysis, some areas had to be deleted or merged. For France, Alpes-Maritimes, Belfort, Meurthe, Meurthe-et-Moselle, Moselle, Rhin (Bas-), Rhin (Hautes-), Savoie, and Savoie (Haute-) were excluded because of territorial changes, most of which were caused by the Franco-German War in 1871. The following British counties were merged: Kent, Middlesex, Surrey, and London; Roxburgh and Selkirk; Orkney and Shetland. Prussia refers to 1861 area all through.

Prussia and in 1900 in Sweden, the evidence for these countries is much less clear-cut.[5] Britain shows no trace of any inverted U curve. Available data from 1795 result in a CV of .22, which implies a considerable levelling tendency in the first half of the XIXth century. On the basis of published data it does not seem to be possible to determine whether or not the Industrial Revolution was accompanied by a peak in regional inequality.[6]

Figures 1-4 provide a picture of where high-and low-wages areas were situated around 1860 and 1910 and where more marked regional declines and advances were taking place. In order to facilitate cross-national comparisons, wages are expressed as a percentage of the national mean. Britain possessed two zones with agricultural wages considerably much above the average in

[5] HELMUT HESSE, "Die Entwicklung der regionalen Einkommensdifferenzen im Wachstumsprozess der deutschen Wirtschaft vor 1913", in *Beiträge zu Wirtschaftswachstum und Wirtschaftsstruktur im 16. und 19. Jahrhundert*, Hrsg. W. Fischer (Berlin: Duncker & Humblot, 1971), analyses the same data but at the more aggregated level of *Provinzen* rather than *Bezirke*. He observes a tendency of divergence between the 1820's and 1875/79 followed by convergence up to 1910. See also FRITZ GRUMBACH AND HEINZ KÖNIG, "Beschäftigung und Löhne der deutschen Industriewirtschaft 1888-1954", *Weltwirtschaftliches Archiv* 79 (1957), for evidence of convergence in *industrial* wages in the last decades of the 19 th century and the beginning of the 20th.

For Sweden, Jörberg's analysis of agricultural wages indicates widening differentials between the 1840's and the 1870's followed by convergence to 1914. His data do not include Stockholm city. See LENNART JÖRBERG, *A History of Prices in Sweden*, 2 (Lund: Gleerup, 1972), p. 229, and LENNART JÖRBERG and TOMMY BENGTSSON, *Regional Wages in Sweden during the 19th Century*, Meddelande från Ekonomisk-historiska institutionen, Lunds universitet, No. 3, 1978.

[6] Levitt and Smout find no evidence of any inverted U curve in their analysis of Scottish wage data between 1790 and 1892. See IAN LEVITT and CHRISTOPHER SMOUT, *The State of the Scottish Working-Class in 1843* (Edinburgh: Scottish Academic Press, 1979), p. 90. For England, however, Caird's data for 1851 indicate growing wage differentials as compared to the first decades of the century. See Bowley, *Wages in the United Kingdom in the Nineteenth Century*, end table; SIDNEY POLLARD, *Peaceful Conquest. The Industrialization of Europe 1760-1970* (Oxford: Oxford University Press, 1981), p. 32.

The tendency of wage differentials to decline towards the end of the XIXth century is noted by HUNT, *Regional Wage Variations in Britain 1850-1914*, p. 59, from whose work the data used here were drawn. Hunt observes a very similar trend for bricklayers' wages in a number of English and Welsh towns, which makes it probable that the convergence tendency was operating in urban areas as well as rural ones.

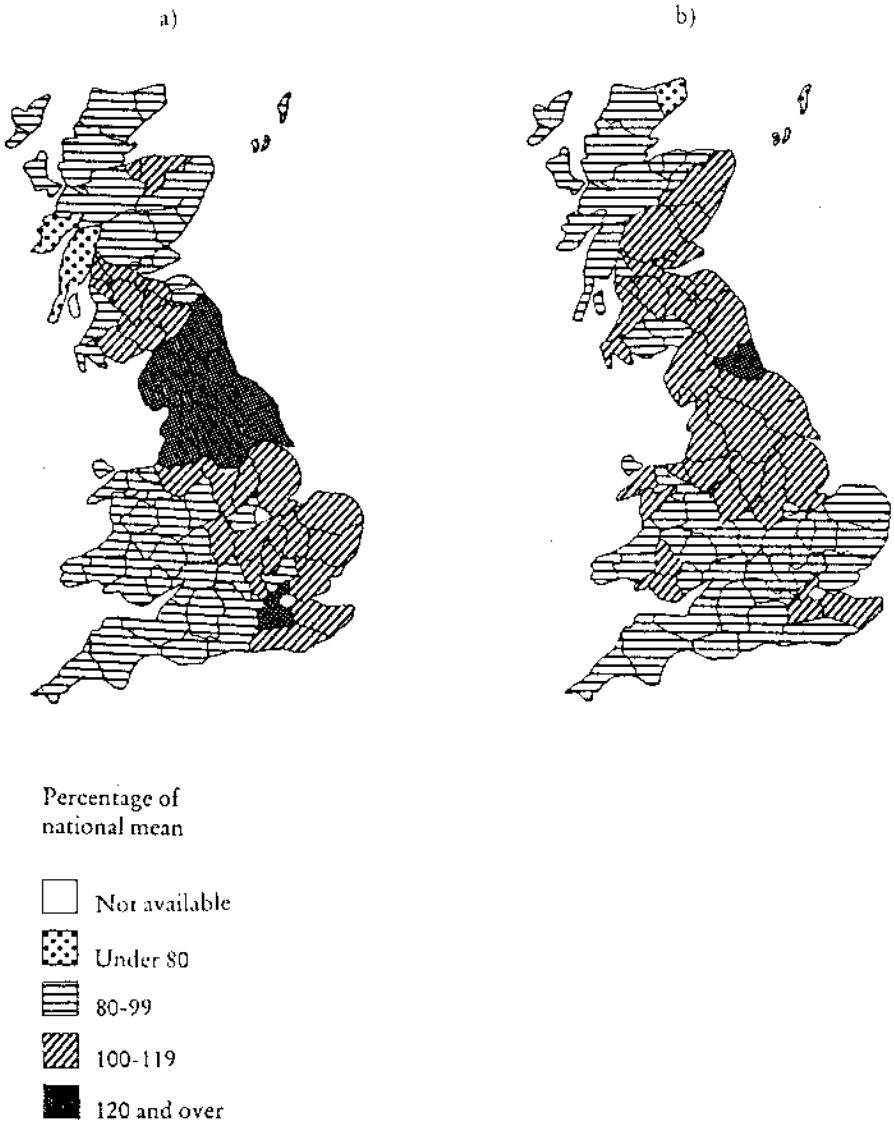
1867/70 (Figure 1a): northern England, including the leading industrialized counties of Lancashire and Yorkshire, and the London region. Southern Scotland and much of north-eastern and south-eastern England were also characterized by comparatively high wages. One of the two prominent low-wages areas was northern and central Scotland, the other Wales and south-western England. A comparison with the situation in 1907 (Figure 1b) indicates the levelling-out tendency that had been at work: the area with moderately high wages had spread northwards into Scotland while relative wages in the previously leading northern England and Metropolitan areas had fallen somewhat. Parts of eastern and south-eastern England had declined while some evident growth had taken place in Wales, especially in the rapidly industrializing Glamorgan. A large area with below-average wages now comprised most of southern and central England outside the London district. On the whole, however, regional change was not extensive during the period.[7]

For France, too, the main impression is one of stability when comparing regional wage structures in 1853/57 and 1911 (Figures 2a and b). At both points in time, the leading metropolitan regions — the *départements* containing the cities of Paris, Lyon, and Marseille — were well above the average. North-eastern and south-eastern France generally had higher wages than the central and western parts of the country. There were two pronounced low-wage zones in the 1850's: the Pyrenees and parts of the Massif Central in the south-west, and Bretagne-Basse Normandie in the north-west. Substantial relative progress took place up to 1911 in the Pyrenees and in the north-west. On the other hand, the Massif Central declined and now occupied an undisputed position

[7] For discussions of the factors producing the relatively poor growth performance of the South-west and East Anglia and the upsurge of southern Wales towards the end of the 19th century, see C.H. Lee, *Regional Economic Growth in the United Kingdom since the 1880's* (London: McGraw-Hill, 1971), especially Chs. 3, 9, and 13, and Wilfred Smith, *An Historical Introduction to the Economic Geography of Great Britain* (London: G. Bell & Sons, 1949, repr. 1968), pp. 148–62.

Figure 1.

BRITISH AGRICULTURAL WAGES AS A PERCENTAGE OF THE NATIONAL MEAN a) IN 1867/70 b) IN 1907



at the bottom of the regional hierarchy. The high- and low-wage regions were less spatially concentrated than in Britain.[8]

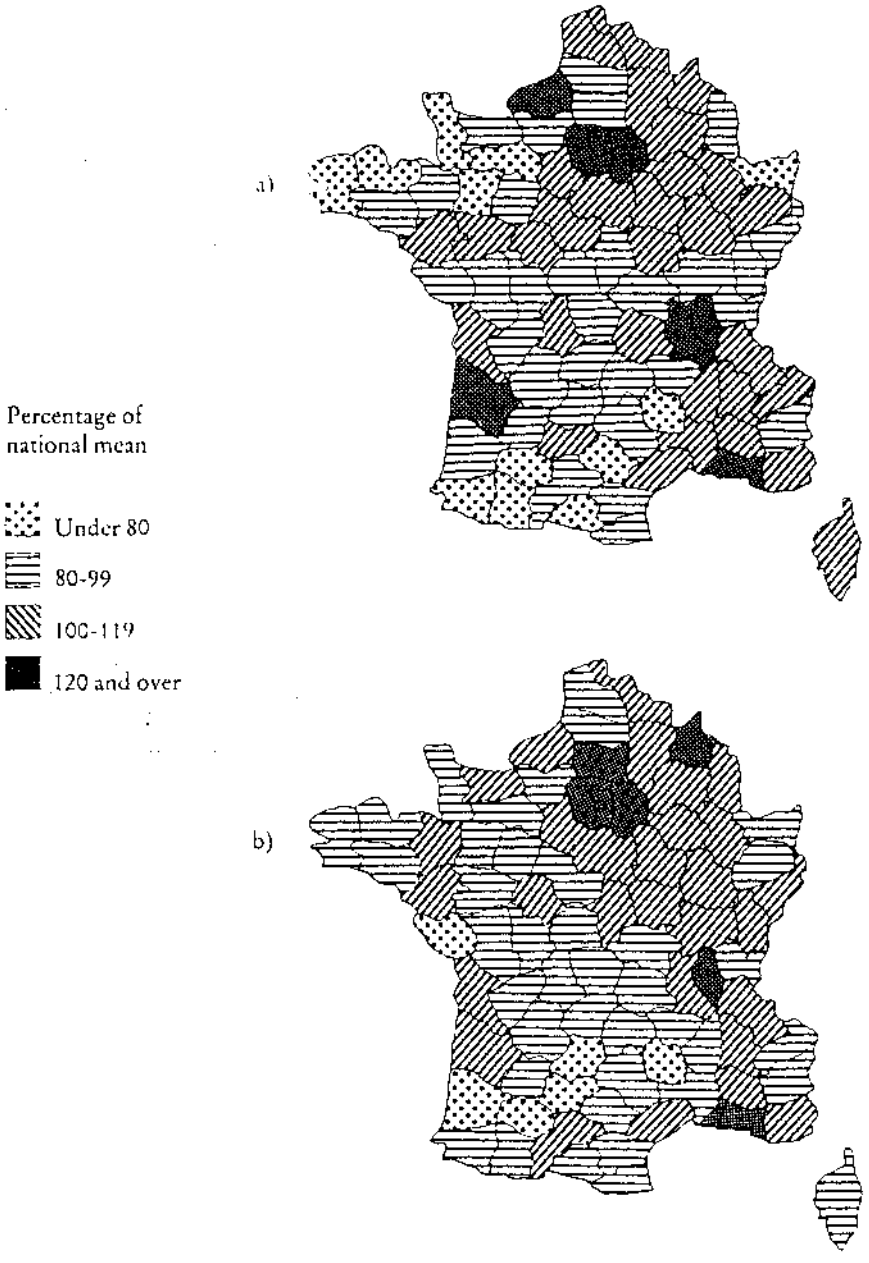
A central theme of German discussion of regional development in the XIXth century has been the dualism between the eastern and western provinces of Prussia, the *'West-Ost-Gefälle'*. There seems to be general agreement that the disparity between the backward East and the more developed West was not produced by the Industrial Revolution; it had come into existence already at beginning of the XIXth century.[9] Figures (a) and (b) depict wage variations in 1860/69 and 1912, respectively, with regard to day wages in Prussia's stateowned forests. At both occasions, the disparity between East and West is the dominant feature of the maps. The evening-out tendency is not strong but clearly noticeable. The high-wage regions in the Rhineland were fewer in 1912. The Düsseldorf *Bezirk* not unexpectedly represented the most rapid relative advancement, while the less rapidly industrializing areas of Trier and Aachen declined in relative terms. The decidedly low-wage regions were fewer, too, in 1912, the Silesian Bezirke and a few others in the East having been able to draw nearer to the national mean. The Prussian high- and low-wage regions were spatially more distinct than in any other investigated country. This does not mean, however, that dispersion was extraordinarily high; it generally fell below that of France and Sweden, as Table 1 made clear. The reason why so much attention has been paid to German regional disparity must be sought in political

[8] It may be pointed out that the wage map for 1853/57 (Figure 2a) provides a picture of interregional differentials very similar to maps describing agricultural wage levels and agricultural productivity in 1862. See Goreux, *op. cit.*, 366, 368. For this reason it makes very little difference if agricultural wages are used instead of the general wage index in the regression analysis in Table 5 below.

[9] Knut Borchardt, "Regionale Wachstumsdifferenzierung in Deutschland im 19. Jahrhundert unter besonderer Berücksichtigung des West-Ost-Gefälles", in *Wirtschaft, Geschichte und Wirtschaftsgeschichte. Festschrift zum 65. Geburtstag von Friedrich Lütge* (Stuttgart: G. Fischer, 1966). See also Rolf Dumke, "Intra-German Trade in 1837 and Regional Economic Development", *Vierteljahrschrift für Sozialund Wirtschaftsgeschichte* 64 (1977), and Pollard, *Peaceful Conquest*, p. 57.

Figure 2.

FRENCH DAY-WAGES AS A PERCENTAGE OF THE NATIONAL MEAN
a) IN 1853/57 b) IN 1911



conditions — out of the countries studied here, only in Prussia regional economic structure gave rise to marked political tension — rather than in exceedingly large overall differentials.

In Sweden, finally, the northern counties formed a large high-wage area about 1860, while the lowest wages were found in the south-east. Up to 1910, the city of Stockholm and the counties of Malmöhus in the far south and Norrbotten in the far north experienced the largest wage increases. This is well in line with what we know about regional economic growth in the period, Malmöhus developing a diversified industrial structure as well as a highly productive agriculture, Norrbotten receiving a growth impetus by the large-scale expansion of mining industry towards the end of the XIXth century, and Stockholm recovering after a long period of stagnation in the century before 1850.[10] Several other northern counties, the area surrounding Stockholm, and large parts of western Sweden fell back relative to the national average. The relatively unindustrialized south-eastern Sweden, however, was the most lagging one still in 1910. Regional wage stability seems to have been lower in Sweden than in the other countries, a matter to which we will return in Section 3.

Assessments of real property offer another way of describing regional economic variation. Cross-national comparisons on this basis, however, can only be partial because of different methods of organizing official statistics. A comparison of assessed values of houses per capita shows a consistently lower CV in Britain than in Prussia (Table 2). British regional inequality thus appears rather low also with regard to this aspect of the property distribution. Moreover, British dispersion was reduced during the period, while the Prussian pattern is another. As with the wages curve, Prussian dispersion rather conforms to a curvilinear path, inequality in 1880

[10] Regional growth trends in Sweden are discussed more fully in JOHAN SÖDERBERG, "Causes of Poverty in Sweden in the Nineteenth Century", *Journal of European Economic History* 11 (1982). The most comprehensive account of Swedish regional economic and demographic development remains that of Gustav Sundbärg, *Betänkande i utvandringsfrågan* (Stockholm, 1913).

Figure 3.
PRUSSIAN DAY-WAGES AS A PERCENTAGE OF THE NATIONAL MEAN
a) IN 1860/69 b) IN 1912

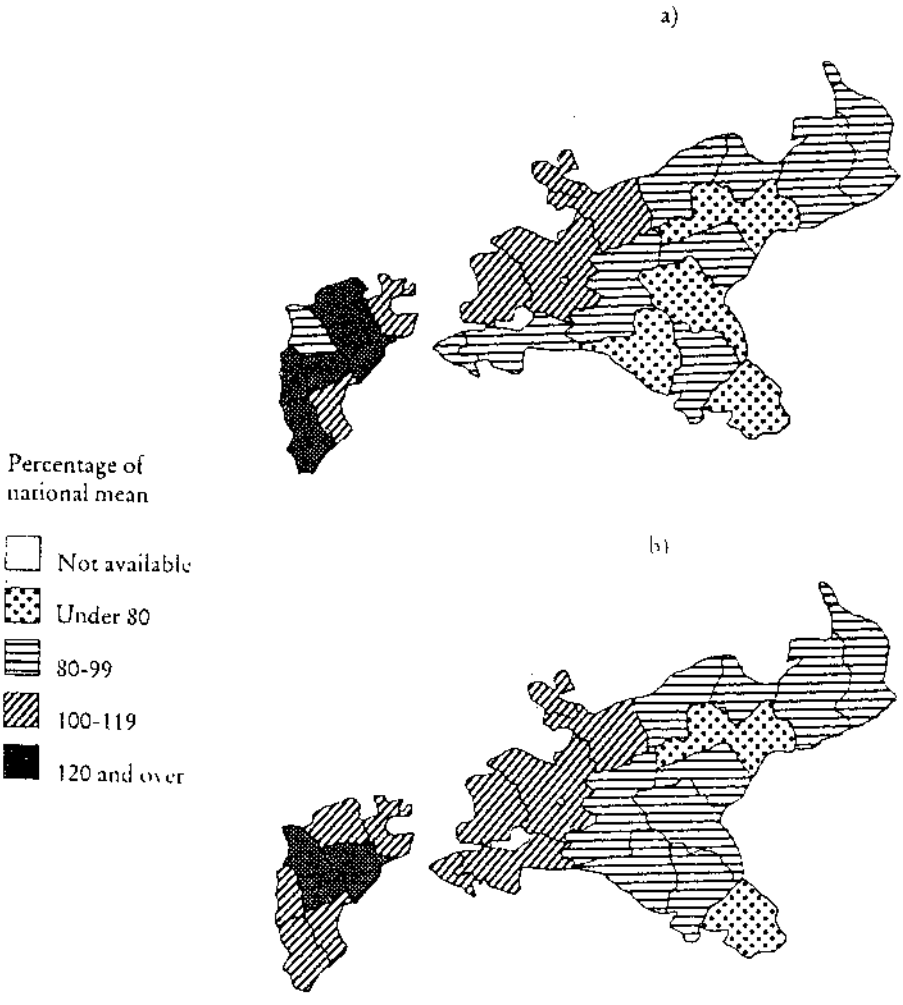
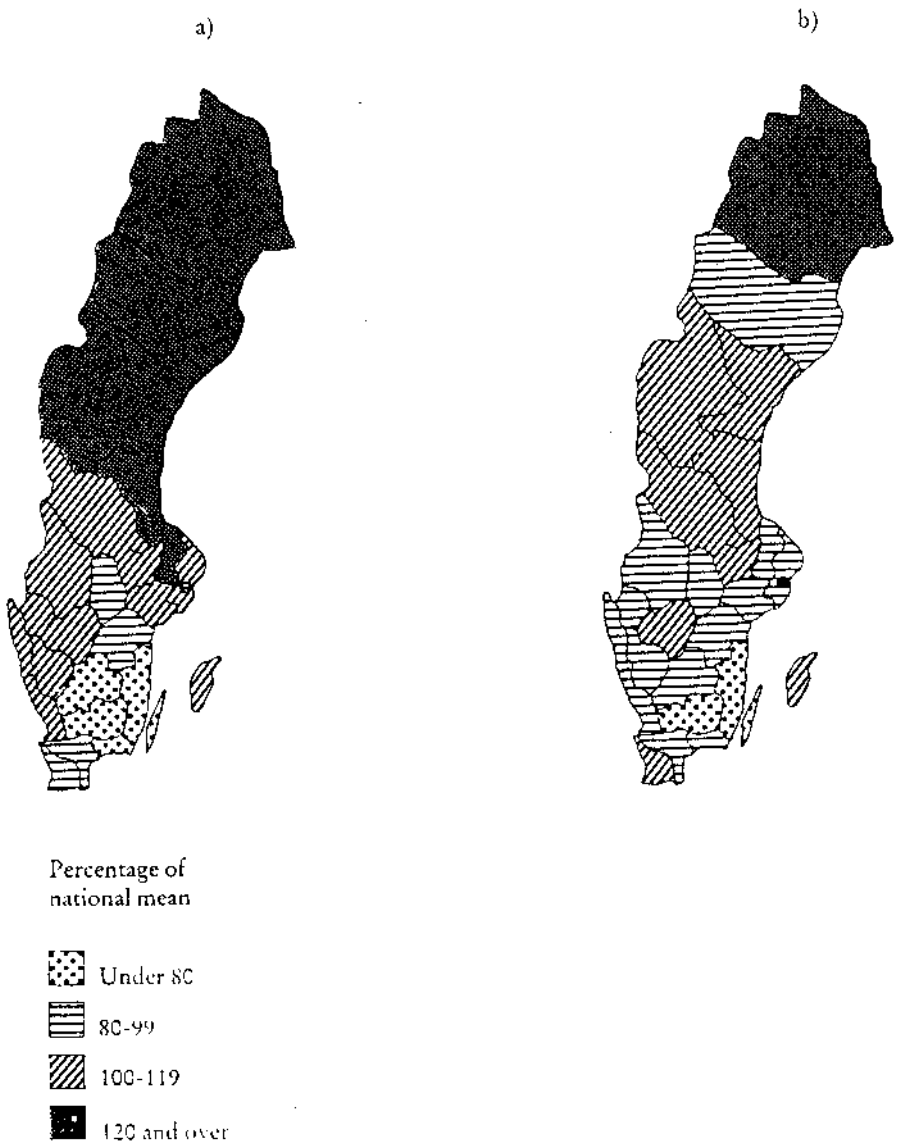


Figure 4.

SWEDISH DAY-WAGES AS A PERCENTAGE OF THE NATIONAL MEAN
a) IN 1858 b) IN 1910



exceeding that in 1864 but falling below that in the beginning of the 20th century. It is of course reasonable that coefficients of variation should be higher for property distributions than for wages data, the distribution of wealth generally being more uneven than that of income.[11]

TABLE 2

COEFFICIENT OF VARIATION FOR ASSESSED VALUES OF HOUSES PER CAPITA IN BRITAIN AND PRUSSIA c. 1860-1910

Year (approx.)	Britain	Prussia
1860	.50	.68
1880		.88
1890	.41	
1900	.40	.74
1910	.40	.67

Sources: Britain: J.C. Stamp, *British Incomes and Property* (London: P.S. King & Son, 1927), pp. 54-6 (data for 1859, 1894/95, 1903/04, 1912/13); Prussia: *Die Gebäude im Preussischen Staate. Preussische Statistik* 18(Berlin: Königlichen Statistischen Bureau, 1871) (data for 1864); August Meitzen, *Der Boden und die landwirtschaftliche Verhältnisse des Preussischen Staates*, 5 (Berlin: Paul Parey, 1894) (data for 1880); *Statistisches Jahrbuch für den Preussischen Staat* 8 (1910) (Berlin: Königlichen Statistischen Landesamt), pp. 324-5 (data for 1900 and 1909).

Lands and houses were not assessed separately in Sweden. However, Britain and Sweden may be compared with regard to the value and lands and buildings taken together. Here, too, Britain comes out as the regionally more homogeneous nation, the CV being .25 and .29 in 1859 and 1912/13, respectively, as

[11] Hechter uses the Schedule A Income Tax, also known as the Property Tax, as an indicator of regional income. It seems more reasonable, however, to regard these data as assessments of real property. They do not provide information about 'rents' in any reasonable meaning, or even less about 'income'. Rather, they refer to estimates of 'annual value' of lands and houses employed to secure uniformity and comparability in spite of various rent arrangements; the amount of rent paid for a given assessed value could be quite different. See MICHAEL HECHTER, *Internal Colonialism. The Celtic Fringe in British National Development* (London: Routledge & Kegan Paul, 1975), pp. 161-3, and Stamp, *British Incomes and Property*, pp. 15-30.

compared to .44 and .56 in Sweden in 1862 and 1910.[12] In other words, regional dispersion in real property values per capita was growing in both countries, though not by very substantial amounts. If capital/labour ratios were increasing more relative to wages in growth areas than in lagging regions, which is likely, a falling trend in regional wage variation would be compatible with widening gaps between regions with regard to property values.

3. *Stability in regional systems*

What were the differences in regional stability between the states? How strong were cumulative tendencies within the systems? Table 3 reports two aspects of regional wage stability. The first is the correlation (r_y) between wage levels ca. 1860 and the percentage point change up to ca. 1910. This should indicate the degree to which change was cumulative in the sense of favouring comparatively developed regions. The second is the rank correlation between levels in 1860 and levels in 1910, indicating the degree to which the regional hierarchy was affected by the wage increases.

TABLE 3

CORRELATIONS BETWEEN WAGE LEVELS CA. 1860 AND THE PERCENTAGE POINT CHANGE UP TO CA. 1910 (R_{XY}) AND BETWEEN WAGE LEVELS 1860 AND 1910 (R_S)

Variables	France	Britain	Prussia	Sweden
Level 1860 - change to 1910	−.56	−.76	−.52	−.54
Level 1860 - level 1910	.62	.73	.78	.16

Sources: See Table 1.

[12] British data from Stamp, *op.cit.*, pp. 54-6, Swedish from *Generalsammandrag öfver 1862 års bevillning* (Stockholm, 1863), and *Fast egendom* 1910 (Stockholm: Statistiska Centralbyrån, 1917).

As suggested by the wage maps, regional stability was lowest in Sweden, where levels in 1858 were practically uncorrelated to those half a century later. Prussian and British wage structures were more stable than that of France, although these three countries form a cluster clearly apart from Sweden. At the same time, the generally rather strong negative correlations between levels about 1860 and growth up to 1910 reveal that larger wage increases tended to take place in low-wage areas. Backward areas were, on the whole, advancing relative to others. Evidently, we cannot characterize this process as one of 'cumulative causation' in the terminology of Gunnar Myrdal, where economic growth is supposed to stimulate already advanced regions at the expense of backward ones. The same applies to a central thesis of the core-periphery theory of John Friedmann, in which the self-reinforcing character of core-region development during industrialization is stressed, this growth assumed to be taking place through a steady weakening of the periphery.[13] While this does not seem to hold generally, another assertion of the core-periphery model is consonant with the findings here: regional systems as a whole were largely stable, the dominant regions likely to remain as such. It should be noted that the tendency of growth in wages to be stronger in low-wage areas did not necessarily produce far-reaching changes in the rank order between regions, as the British and Prussian cases clearly show. For instance, Oppeln in Upper Silesia, emerging as a major coal mining district,[14] belonged to the regions enjoying the strongest percentage growth in wages. This did not, however, affect the rank order between regions, Oppeln occupying the bottom position at the beginning as well as at the end of the period.

[13] Gunnar Myrdal, *Rich and Poor Nations* (London: Duckworth, 1957), Chs. 2-3; John Friedmann, "A General Theory of Polarized Development", in *Growth Centers in Regional Economic Development*, ed. N. M. Hansen (New York: The Free Press, 1972).

[14] Norman J.G. Pounds, *The Upper Silesian Industrial Region* (Bloomington, Ind.: Indiana University Publication, 1958), Ch. 4.

Another indicator, a very simple one, of regional stability is the correlation between population growth in successive periods. This measure has the advantage that it can be used to describe patterns further back in time. Table 4 reports such correlations (r_{xy}) for three periods: 1820-50, 1850-80, and 1880-1910.

TABLE 4

CORRELATIONS BETWEEN PERCENTAGE POPULATION CHANGE IN 1820-50, 1850-80, AND 1880-1910

	1850-80	1880-1910	1850-80	1880-1910
	France		*Britain*	
1820-50	.88	.77	.80	.53
1850-80		.88		.70
	Prussia		*Sweden*	
1820-50	.82	.25	.15	−.08
1850-80		.55		.84

Sources: France: *Statistique de la France. Territoire, population* (Paris, 1837); *Annuaire statistique de la France* (Paris: Institut national de la statistique et des études économiques, 1966); Britain: B.R. Mitchell, *Abstract of British Historical Statistics (Cambridge: Cambridge University Press, 1962)*; Prussia: *Rückblick auf die Entwicklung der preussischen Bevölkerung von 1875 bis 1900* (Berlin: Königlich Statistisches Bureau, 1904); Sweden: *Historisk statistik för Sverige*, 1 (Stockholm: Statistiska Centralbyrån, 1967).

These correlations are highest throughout in France, pointing to an unusual continuity in regional population growth. Sweden represents the other extreme, regional population change in 1820-50 being practically unrelated to that in the two subsequent periods. Evidently, a marked regional shift in population growth occurred in Sweden around the middle of the XIXth century, followed by a stabilization in the latter part of the century. This regional discontinuity can be dated to approximately the 1860's; it was caused by agrarian population pressure built up in the previous century beginning to erode due to oversea emigration and industrialization. Emigration especially affected relatively poor rural areas in south-eastern and western Sweden, where the pre-

vious population growth had been sustained by an expansion into marginal lands.[15]

Between 1850-80 and 1880-1910, on the other hand, regional population growth was nearly as stable in Sweden as in France. The most substantial change now occurred in Prussia; it is linked to the emergence of the Ruhr as the major industrial growth pole and to heavy out-migration from the lagging provinces in the East.

To sum up, we find greater changeability in the wage structure and in regional population growth in Sweden than in the other countries. Stability in both respects was much higher in France. Prussia experienced more extensive change in population growth in the latter half of the XIXth century than Britain did, while stability in the regional wage structure was about the same.

4. *Migration and regional dynamics*

Sections 2 and 3 above dealt with dispersion and stability in regional systems. They did not discuss, however, to what extent variations in regional economic conditions generated adaptations within the systems. Although it would be desirable to trace interregional flows of investment and other economic activity, this is not feasible. Instead, attention is directed towards net migration (the sources do not admit the separation of inward from outward migration). To what extent were net migration rates influenced by regional economic conditions such as levels and changes in wages and urbanization, and what was the relative importance of these factors?

The maps exhibiting mean decennial migration rates 1860-1910 (Figures 5-8) employ the same shading in order to facilitate cross-national comparison. Pronounced out-migration zones also

[15] For an overview of research on Swedish emigration, see *From Sweden to America. A History of the Migration*, eds. HARALD RUNBLOM and HANS NORMAN (Uppsala: Acta Universitatis Upsaliensis, 1976).

Figure 5.

MEAN DECENNIAL NET MIGRATION IN BRITAIN 1860-1910

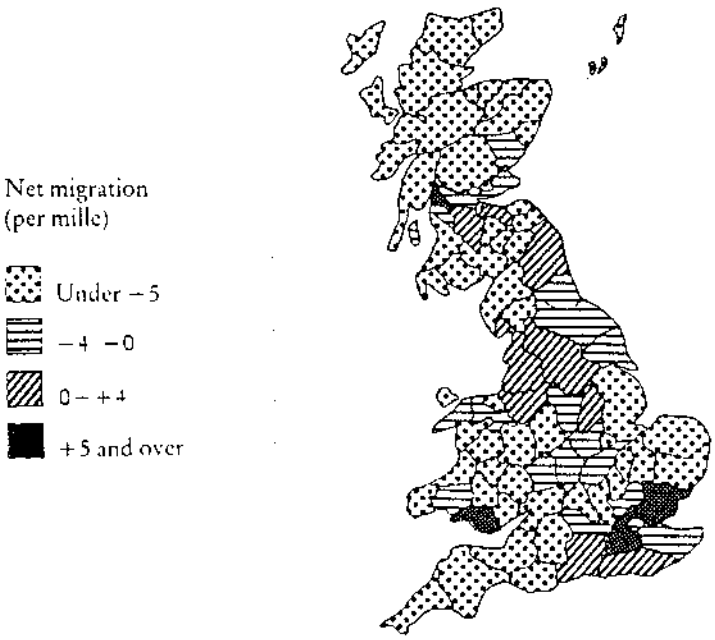


Figure 6.

MEAN DECENNIAL NET MIGRATION IN FRANCE 1860-1910

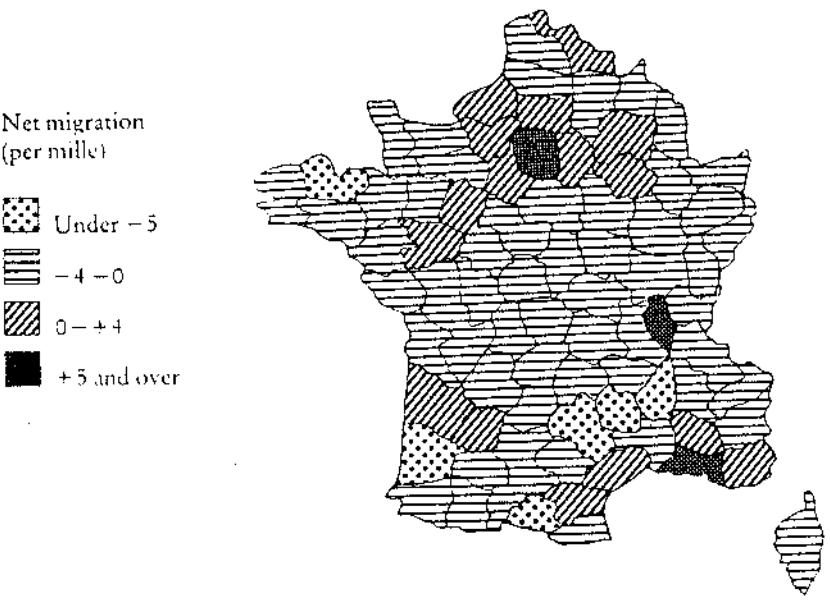


Figure 7.

MEAN DECENNIAL NET MIGRATION IN PRUSSIA 1860-1910

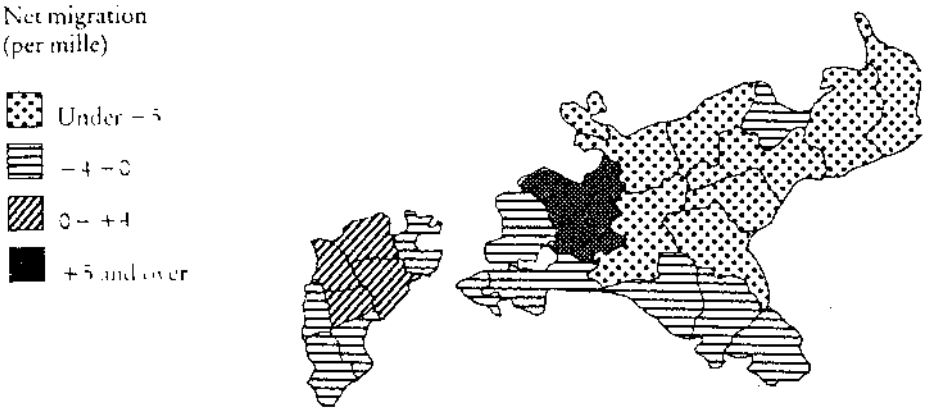
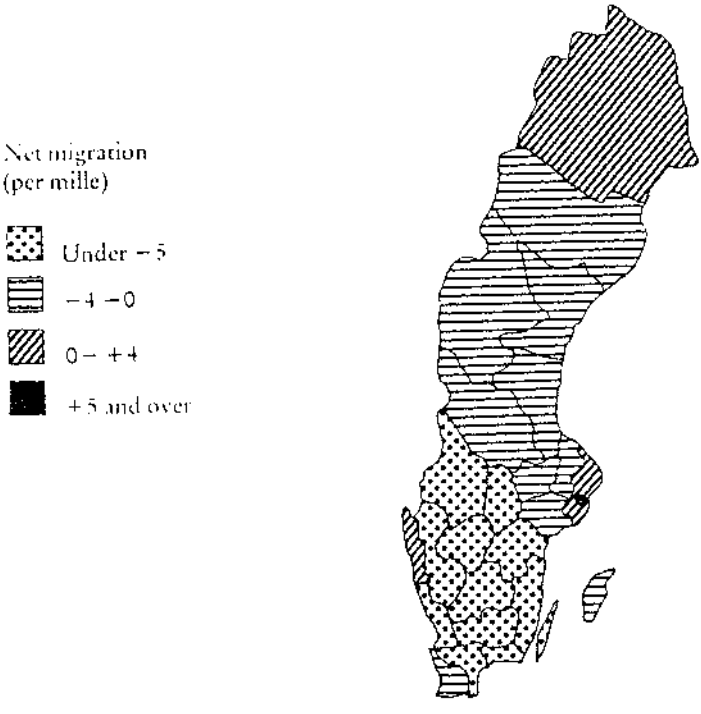


Figure 8.

MEAN DECENNIAL NET MIGRATION IN SWEDEN 1860-1910



tended to be low-wage areas. Most prominent among the in-migration zones were the Paris, Lyon, and Marseille regions in France, the London district and southern Wales in Britain, Berlin-Potsdam in Prussia, and Stockholm city in Sweden. Overall regional dispersion in migration rates was remarkably similar between the countries, the standard deviation for Sweden of 6.0 being only slightly higher than those for Prussia, France, and Britain (5.3, 5.2, and 4.9, respectively).

In order to determine the size of differences between nations with regard to the sensitivity of migration to underlying regional conditions, a regression equation was formulated with the net migration rate 1860-1910 as the dependent variable. Four independent variables were used: the wage level (as a percentage of the national mean) and the urban share of total population about 1860, and the change in both these variables up to 1910. Results are presented in Table 5.[16]

[16] For other quantitative analyses of French regional migration see PAUL HOHENBERG, "Migrations et fluctuations démographiques dans la France rurale, 1835-1901", *Annales E.S.C.* 29 (1974), and WILLIAM H. NEWELL, *Population Change and Agricultural Development in Nineteenth Century France* (New York: Arno, 1977). Hohenberg's study is concerned with rural conditions only; 29 of the most highly industrialized and urbanized départements were excluded. Moreover, he worked with birthplace rather than net migration data. Newell dealt with an earlier period, c. 1815-70. For these reasons, results in this paper are not directly comparable to those of Hohenberg and Newell.

For a recent investigation into the relationship between migration and economic growth in Germany, 1882-1907, see ALLEN R. NEWMAN, "A Test of the Okun-Richardson Model of Internal Migration", *Economic Development and Cultural Change* 29 (1981). His study covers the German Empire, not only Prussia. The principal problem with his model-a simultaneous, three-equation system - is associated with the regional income variable drawn from THOMAS J. ORSAGH, "The Probable Geographical Distribution of German Income, 1880-1963", *Zeitschrift für die gesamte Staatswissenschaft* 124 (1968). Orsagh estimated income from data on occupational structure by means of regression analysis. As Newman uses these income figures as an endogeneous variable, and also (as exogeneous) the same employment data on which Orsagh's estimates were based, a redundancy is introduced which, due to the simultaneity of the system, affects all parameters. Either income would have to be estimated independently of the occupational structure, or the latter variables would have to be dropped from the model. Because of the differences between Newman's analysis and the present one it is

TABLE 5

RESULTS OF REGRESSION ANALYSIS WITH THE NET MIGRATION RATE 1860-1910 AS THE DEPENDENT VARIABLE. REGRESSION COEFFICIENTS AND R^2

Variable	France	Britain	Prussia	Sweden
Wage level	.13[b]	.00	.09[a]	.15[b]
Wage change	.04[b]	.00	.04	.02
Urbanization level	.09[b]	.19[b]	.03	.21[b]
Urbanization change	.03	.26[b]	.37[a]	.11
R^2	.87	.57	.59	.81

[a] Coefficient significantly different from zero at five-percent level.
[b] Coefficient significantly different from zero at one-percent level.

Sources: Wages: See Table 1 above. Data on net migration and urbanization were drawn from a number of census reports, the listing of which would occupy too much space here. Detailed references are obtained in *International Population Census Bibliography 6: Europe (Austin, Tex.: Bureau of Business Research, The University of Texas, 1967), and Guide to Census Reports. Great Britain, 1801-1966* (London: HMSO, 1977). Swedish migration data are also found in Erland Hofsten and Hans Lundström, *Swedish Population History. Main Trends from 1750 to 1970* (Stockholm: Statistiska Centralbyrån, 1976), p. 144, Scottish in *Annual Report of the Registrar-General for Scotland* 100 (1954) (Edinburgh, 1955), Appendix 9, French (up to 1901) in *Statistique annuelle du mouvement de la population* 31 (1901) (Paris, 1902), table at p. lxiv.

probably coincidental that the R^2 obtained in his net migration equation is very close to the one given here.

Regional patterns of migration in Germany are also discussed by JOHN E. KNODEL, *The Decline of Fertility in Germany*, 1871-1939 (Princeton, N.J.: Princeton University Press, 1974), Ch. 5. For Britain, see D. FRIEDLANDER and R.J. ROSHIER, "A Study of Internal Migration in England and Wales, Part 1: Geographical Patterns of Internal Migration 1851-1951", *Population Studies* 19 (1966); R. LAWTON, "Population and Society 1730-1900", in *Historical Geography of England and Wales*, eds. R.A. DODGSON and R.A. BUTLIN (London: Academic Press, 1978); R.H. OSBORNE, "The Movements of People in Scotland 1851-1951", *Scottish Studies* 2 (1958); *Scottish Population History from the 17th Century to the 1930's*, ed. MICHAEL FLINN (Cambridge: Cambridge University Press, 1977), pp. 459-79.

Considerably much higher R^2's are obtained for Sweden and France than for Britain and Prussia. French and Swedish net migration was affected by regional wage differentials as well as by differences in urbanization levels existing in 1860. British migration, on the other hand, may be described more parsimoniously: it was closely tied to urbanization levels and urban growth, whereas regional wage differentials and wage changes had no demonstrable effect over and above these variables.

These results reflect fundamental differences between the industrialization processes in the four countries, the British experience much more resembling the classic Marxist conception of urban- and factory-based capitalist development (Britain, of course, being the blue-print at Marx' disposal). Britain's path was, however, historically unusual. Coefficients for France and Sweden are rather similar, indicating common traits in the patterns of development: a more complex growth process where rural areas participated to a higher degree and where industrial and urban growth were distinct although related phenomena. Prussia would seem to occupy an intermediate position in these respects between France and Sweden on one hand and Britain on the other. At the same time, Prussian growth had its special characteristics, e.g. the slight influence of urbanization levels on subsequent migration, which is due to the fact that some of the lagging areas in the East were comparatively urbanized in 1860 although unable to prevent considerable out-migration. Even the rather crude model employed here makes it possible to describe national growth characteristics in a more diversified way than by mere reference to the dichotomy between Britain and other industrializing economies.

The most striking of the regression results is the high extent to which observed rates of regional net migration in France were connected to variation in the economic variables captured here. This responsiveness of migration should be one reason not to regard France as a relatively rigid economy in this major period of industrialization. For Sweden, the high R^2 obtained is less

surprising in view of the fairly changeable regional structure noted in the preceding section.[17]

Even if migration were to be perfectly responsive to economic conditions, it would not necessarily contribute towards narrowing interregional differentials. In-migration may induce increased investment in physical capital which would in turn encourage growth in employment and wages. Increasing returns to scale in the destination regions may counteract convergence. Moreover, migration is always selective, and non-homogeneity characteristics of the labour force (with regard to education, skill, age etc.) may well be reinforced.[18] While it should be safe to suppose that the migration actually taking place redistributed population so as to improve the overall efficiency of the economy, the lack of a universal convergence trend in wages should not come as a surprise.

[17] RICHARD ROEHL, "French Industrialization: a Reconsideration", *Explorations in Economic History* 13 (1976), summarizes and critically re-examines the traditional characterization of French economic growth in terms of 'stagnation' and 'retardation'. Despite his more positive view of the growth performance of this nation even Roehl, however, states: "The French valued the traditional ways of doing things: family and village ties, and social continuity and stability. Relatively speaking, they valued them over the greater social and geographical mobility characteristic of modern society, over the life-style and fractured families common to urban centers of industrial regions, over the social strain and dislocation which so often accompany more rapid rates of transition" (p. 273). No data are cited to support this conclusion. It seems to me that two issues are being confounded. One deals with French industrialization in rural/urban terms; here Roehl is certainly right in emphasizing the differences compared to Britain, where industrialization to a higher extent took place within an urban context. The other concerns resistance to mobility, where Roehl's statement gives an impression of rigidity which is not borne out by migration data.

[18] HARRY W. RICHARDSON, *Elements of Regional Economics* (Harmondsworth: Penguin, 1969), Ch. 2. The persistence of sizeable regional earnings differentials in spite of heavy interregional migration has often been noted in empirical studies on modern data; for a useful review see MICHAEL J. GREENWOOD, "Research on Internal Migration in the United States: a Survey", *Journal of Economic Literature* 13 (1975). Results indicating even a tendency of migration to widen regional income differentials are not uncommon; see, e.g., BERNARD OKUN, "Interstate population Migration and State Income Inequality: a Simultaneous Equation Approach", *Economic Development and Cultural Change* 16 (1968); ÅKE DAHLBERG and BERTIL HOLMLUND, "The Interaction of Migration, Income, and Employment in Sweden", *Demography* 15 (1978); MICHAEL J. GREENWOOD, "An Econometric Model of Internal Migration and Regional Economic Growth in Mexico", *Journal of Regional Science* 18 (1978).

Conclusions

No dramatic case of increasing regional economic polarization between 1840 and 1910 has been found in this study. Regional wage differentials generally declined between the beginning and the end of this period. The clearly smallest wage differentials were found in Britain, the largest in France a few decades after the middle of the XIXth century. In the beginning of the XXth century, Swedish dispersion somewhat exceeded Prussian and French. France provides the clearest case of the inverted U curve, and there are indications in that direction, although much weaker, for Prussia and Sweden. For Britain, on the other hand, there is no trace of such a curve. The path of dispersion in values of houses per capita in Britain and Prussia was similar to that of wages, lending support for the curvilinear hypothesis for the latter country but not for the former.

Regional stability, measured by changes in wages and in population growth between successive periods, tended to be highest in France and lowest in Sweden. The indications of a discontinuity in Swedish regional development around the 1860's, connected with a transition from a situation with heavy population pressure to one where new alternatives emerged, had no counterpart in the other states. There were no signs of any cumulative causation process characterized by more rapid wages growth in advanced regions than in backward ones. On the contrary, such growth tended to be higher in the lagging regions of all four countries.

Finally, one aspect of regional dynamics was studied: the responsiveness of migration to economic variables (levels of and changes in wages and urbanization). Swedish and French net migration rates proved to be more closely associated with these variables than British and Prussian. The French and Swedish regional systems must be regarded as fairly adaptable in this respect.