

Competition or complement? The relation between towns and rural industrialisation in Sweden 1820-96¹

Pernilla Jonsson & Fredrik Sandgren. Department of Economic History, Uppsala University

Summary

This article studies the relation between rural industry and urban service functions in Mälardalen and the Southeast of Sweden 1820-90. The conclusion is that the general dynamic influence of towns highlighted in many British studies cannot be found in Sweden. Despite an overall increase in trade, financial services and information during the nineteenth century, Swedish towns did not in general serve as stimulating relays for rural industry. Instead, industries close to smaller towns choose to market and finance their goods via larger and more distant towns. First in the 1890s an actual effect of access to urban services became evident.

¹ The research presented in this article was financed by the Swedish Research Council. We are very grateful for comments from three anonymous referees. Major help with the quantitative analysis has been provided by Niklas Korsell. Helpful comments on the text and quantitative analysis have also been provided by Dan Bäcklund, Erik Lindberg, and Magnus Myrholm. Major help with preparing the vast body of data into a database has been provided by Hampus Markensten and with the creation of maps by Göran Hammer. Without the coordinates from Göran Kristiansson the making of the maps would have been impossible. Our crude English has been modified into the Queen's English with the help of Lynn Karlsson.

It is a well-known fact that towns have been important in European economic history. Moreover, there is a general belief that dynamic towns of all sizes could stimulate industrialisation far beyond the town-walls. Especially in Britain, a systematic discussion of the role of provincial towns in mediating goods, credit and information to and from their hinterlands during the industrial breakthrough has developed. In regions where a concentration of rural industry developed, close functional links between towns and their hinterlands stimulated economic change and growth. The urban system formed a service network that rural industry could take advantage of.² In this urban system, towns acted as centres for important growth-enhancing functions, such as commercial and financial services, communication nodes, legal and political institutions, labour markets and dense social environments and the circulation of information.³ There were, however, dynamic links between the urban and rural economies even before industrialisation proper, as the development of proto-industrial districts relied on towns as mediators of inputs and access to market channels as well as capital.⁴ To sum up, the extent to which the nearest town could provide the hinterland with service functions could be decisive for rural economic development.⁵

It is, however, important to stress that the relations between towns and their hinterlands could either lack the dynamics highlighted above or take on the character of competition. In most European countries other than England, urban guilds and legal restrictions surrounding production and trade acted as obstacles to rural development. The obstacle could be direct,

² Stobart, 'Geography and industrialization: the space economy of Northwest England, 1701-1760', pp. 686-88. Stobart is referring to Langton, *Geographical change and industrial revolution: coalmining in South West Lancashire, 1590-1799*; Christaller, *Central places in southern Germany*; Clark & Lepetit, 'Introduction'; Hann, 'Industrialisation and the service economy'; Reed, 'London and its hinterland 1600-1800: the view from the provinces'; Wadsworth & De Lacy Mann, *The cotton trade and industrial Lancashire 1600-1780*; Vries, *European urbanization, 1500-1800*, pp. 255-63.

³ Bácskai, 'Small towns in eastern central Europe'; Chalklin, *The rise of the English town, 1650-1850*; Clark, *The transformation of English provincial towns 1600-1800*; Corfield, *The impact of English towns 1700-1800*; Ellis, 'The Transformation of European Agriculture'; Ellis, *Regional and county centres 1700-1840*; Glennie & Whyte, *Towns in an Agrarian Economy 1540-1700*; Langton, 'Urban growth and economic change c. 1688-1841'; Mitchell, 'The development of urban retailing 1700-1815'; Mui & Mui, *Shops and shopkeeping in eighteenth-century England*; Phillips, 'Town and country: economic change in Kendal c. 1550-1700'; Reeder & Rodger, 'Industrialisation and the city economy'; Shaw, *The European scene: Britain and Germany*; Thirsk, *Economic policy and projects: the development of a consumer society in early modern England*; Weatherill, *Consumer behaviour and material culture in Britain, 1660-1760*; Pred, *Urban growth and the circulation of information: the United States system of cities, 1790-1840*.

⁴ Berg, *The age of manufactures: industry, innovation and work in Britain 1700-1820*; Hudson, *The genesis of industrial capital: a study of the West Riding wool textile industry c.1750-1850*; Kriedte, Medick & Schlumbohm, *Industrialization before industrialization: rural industry in the genesis of capitalism*.

⁵ Clark, *The transformation of English provincial towns 1600-1800*.

such as a ban on rural trade, or indirect, such as the power of guilds stifling urban industrial development and thereby also limiting rural industry.⁶ It has also been argued that the size of the town influenced rural dynamics. Small towns had less impact on rural dynamics than larger towns. Moreover it has been shown that the overall importance of the urban network was limited in regions that industrialised early, had a sparse population or where the impact of a metropolitan city overshadowed that of all other towns.⁷ Moreover, the industrial take-off in a nearby town could mean reduced opportunities for rural industry, followed by the industrial decline of the hinterland.⁸

Industrialisation was thus not the self-evident outcome of economic development. A key factor behind the growth of industry was to what extent people could or had to find other means of employment than in agriculture. This, in turn, depended on the character and organisation of agriculture as well as on what linkages agriculture had to industry and services. A key development during the nineteenth century was an increased spatial division of labour between agricultural and industrial regions or localities. The dynamics of this process was mixed. Industrial regions developed through a combination of the existence of good conditions for industry (e.g. raw materials, labour and communications) and the lack of good conditions for agriculture. When industry expanded, it could use its immediate hinterland as a purveyor of industrial labour and/or for the input of different types of goods.⁹ This meant that some regions in Western Europe came to be increasingly specialised in agricultural production (increasingly combining arable farming and animal husbandry), a structure that was disrupted, however, by the emergence of overseas and Eastern European grain and meat producing regions during the course of the nineteenth century.¹⁰

The urban-rural interplay and economic development has in general been dependent on access to communications. Lowered transport costs has enabled the spread of information, wider markets, and increased possibilities to re-locate industry. In the process, industrial regions or individual companies could either fail or succeed, depending on how industries and

⁶ Cerman & Ogilvie, *European proto-industrialization*; Houston & Snell, 'Proto-industrialization? Cottage Industry, Social Change, and Industrial Revolution'; Kriedte, Medick & Schlumbohm, *Industrialization before industrialization*; Ogilvie, *State corporatism and proto-industry: the Württemberg Black Forest, 1580-1797*.

⁷ Royle, 'The development of small towns in Britain', p. 158.

⁸ Lemon, *The best poor man's country: A geographical study of early southeastern Pennsylvania*; Marks, 'Rural response to urban penetration: Baltimore and St. Mary's County, Maryland, 1770-1840'.

⁹ Pollard, *Peaceful conquest: the industrialization of Europe, 1760-1970*, pp. 10ff.

¹⁰ Dovring, 'The Transformation of European Agriculture', pp. 664ff; Pollard, *Peaceful conquest*, pp. 264ff.

companies managed to meet, on the one hand, the possibilities created by growing markets and, on the other hand, the simultaneous process of increased competition from other countries, regions and companies. Changes in transport systems could also re-shape urban systems. Thus, while the growth of transport systems such as waterways and railways could improve communications in general, it could also create a positive reinforcement of the nodal positions within the urban system, which to a certain extent could be negative for the development of the hinterland.¹¹

A final aspect that has to be addressed is the fact that the possibilities for the location of rural industry shifted between industries.¹² In the nineteenth century, access to raw materials and power could more or less tie an industry to a certain place, while established links to markets, capital and inputs could make relocation more or less difficult.¹³ In reality the success or failure of a certain location was explained by a multitude of factors, from the geological and biological characteristics of each location to the individual capacities of managers and workers at the production site. There is, however, an evident dividing line between, on the one hand, industries (which could be labelled extractive industries) that were reliant on easy and cheap access to raw materials, and, on the other hand, industries (which could be labelled non-extractive industries) that were more reliant on market access. Historically the first type comprises industries that focused on the direct extraction of raw materials or a more or less crude refinement of them such as mines, quarries, bar iron works and sawmills, while the second type of industry comprises industries such as textile plants, mechanical workshops, and other industries producing finished and semi-finished goods.¹⁴

To sum up, the relations between towns and their hinterlands could be either positive or negative for the development of rural industry. Proximity to a town could stimulate rural industry, offering service functions and a complementary industrial development. But the

¹¹ For an overview of arguments regarding the effects of transportation in general and on certain industries, see Szostak, *The role of transportation in the industrial revolution: a comparison of England and France*, pp. 10ff. Szostak in turn refers to Fogel, *Railroads and American economic growth: essays in econometric history*; O'Brien, *Railways and the economic development of Western Europe 1830-1914*. See also Abbott, *Frontiers and Sections: Cities and region in American Growth*; Ville, *Transport and the development of the European economy, 1750-1918*. About the effects of transports on individual industries, see also Lemire, *Fashion's favourite: the cotton trade and the consumer in Britain, 1660-1800*.

¹² Lösch & Woglom, *The economics of location*, p. 377.

¹³ Pollard, *Peaceful conquest*, pp. 112-13.

¹⁴ Lösch & Woglom, *The economics of location*, pp. 376-80; Pollard, *Peaceful conquest*, pp. 120-2; Hollen Lees, 'Urban networks', 2000, pp. 79-80.

nearest town could also create an obstacle to rural growth, setting up institutional barriers by being too efficient or too small so that the development of rural industry was hampered.

Swedish industrialisation during the nineteenth century was to a large extent a rural phenomenon, and Swedish towns were comparatively small. While Sweden was an industrial latecomer in Western Europe, the localisation of industry outside urban areas did not prevent Sweden from experiencing substantial economic growth from 1850 and onwards. Between 1850 and 1950 the Swedish economy had among the highest and most stable growth rates in the Western world.¹⁵ Moreover, Swedish economic historian Dan Bäcklund has concluded that the service functions of regional centres and small towns may have been more important for Swedish economic growth than similar types of urban centres were for Western European economic development in general.¹⁶ It is therefore interesting to discuss to what extent rural industrial growth in Sweden was facilitated or hampered by the functions and services towns could provide, which moreover could show whether the relation between town and hinterland was competitive or complementary.

The aim of this article is to study the development of rural industry and urban service functions from a regional perspective. More precisely we will try to estimate what impact urban service functions in the nearest town and access to communications had on the development of rural industry in the hinterland. Recently digitalized parish data for Sweden, available on the Internet, has greatly facilitated the quantitative analysis of large data sets.¹⁷ We believe that the results of this study are interesting both from a narrow Swedish as well as a more general perspective. On the one hand, we will be able to discuss relations between towns and rural industrialisation in a more systematic way than has been done before in Swedish research. On the other hand, our quantitative approach will complement and possibly shed new light on the general relations between towns and rural economic development discussed in previous studies, not least since these conclusions rest on the summation of a large body of micro level studies on individual towns and their hinterland and not on an analysis of aggregate data.

For this article we have chosen to study two Swedish regions: on the one hand, Mälardalen – five counties surrounding Lake Mälaren – and, on the other hand, the Southeast – four

¹⁵ Maddison, *Phases of capitalist development*, p. 44, Table 3.1.

¹⁶ Bäcklund, *De svenska tätorternas storleksstruktur 1820-1970*, pp. 13-5 and p. 31.

¹⁷ The Demographic Data Base (DDB), Umeå University, <http://www.ddb.umu.se>.

counties in the southeast part of Sweden.¹⁸ An important reason for choosing these two regions is the large differences that characterised their economic prospects at the outset of the nineteenth century. Mälardalen had a long industrial tradition of iron production. The region also had a developed trade, good waterway communications, a large and dense urban system and proximity to the only metropolitan town in Sweden – Stockholm. In the Southeast, industry and trade was much less developed in the early nineteenth century. Moreover, towns were few and scattered and inland communications poor. During the course of the nineteenth century, both regions experienced increases in overall population and in urbanisation, a growth in both urban and rural industry, and finally the introduction of railways between the years 1820 to 1890/96.

We have chosen to analyse ‘extractive industry’ (here defined as mines, quarries and metal works) and ‘non-extractive industry’ (all other types of industry) separately. Historically the location of mines and iron works depended on easy access to raw materials (wood/charcoal, iron ores) and power (mainly waterpower). As both charcoal and water power were important for the Swedish iron industry until the second half of the nineteenth century, the possibilities for locating and, more importantly, relocating extractive industries at will were limited.¹⁹ The decisive factor for the possible location of mines and iron production in the two studied regions is likely to have been access to iron ores, as both wood and water were fairly evenly distributed, while access to iron ores was not. ‘Non-extractive’ industries (e.g. the textile, food and leather industries, sawmills, metal manufacture and brick works), were also to some extent based on the exploitation of raw-materials, i.e. sawmills, paper mills and flour mills. The important difference in relation to the ‘extractive’ industries was that industries such as sawmills, paper mills and flourmills could find the required raw materials almost anywhere in the two regions, thereby in practice being less tied to certain locations. Moreover, non-extractive industries would be less dependent on the transport costs of raw materials and instead be more dependent on access to markets, labour and the level of land rents.²⁰

The timeframe for our study is the years 1820-96, represented by the sample years 1820, 1850 and 1890/96. The period includes the prelude to the industrial take off in the 1850s, as

¹⁸ Mälardalen comprises the counties of Stockholm, Uppsala, Södermanland, Västmanland and Örebro. The Southeast comprises the counties of Jönköping, Kronoberg, Kalmar and Blekinge.

¹⁹ Heckscher, *Till belysning af järnvägarnas betydelse för Sveriges ekonomiska utveckling*, pp. 88 and 101.

²⁰ E.g. Lindberg, ‘An economic-geographical study of the localization of the Swedish paper industry’; North, ‘Location theory and regional economic growth’, p. 253.

well as the development towards a more mature industrial society in the 1890s. An important aspect of industrial development was that the industrial base of Sweden was broadened during the nineteenth century. Swedish industry moved from a dependency on rather crude raw-material based industries (extractive industry) reliant on foreign demand to an increased importance for industries producing finished or semi-finished goods (non-extractive industry) for consumers and producers also on the domestic market. The period also includes important institutional developments such as the Free Trade Acts of 1846 (banning guilds and making it possible to set up countryside shops outside a 30 km radius from each town) and 1864 (the full liberalisation of industry and trade), as well as the development of a modern financial market from the 1820s. From the mid nineteenth century the introduction of the railways and steamboats also increased access to markets and cheaper transports for both urban and rural industry.²¹

Thus, many things other than urban-rural relations created improved possibilities for rural industrial growth in the Swedish economy. An effort to thoroughly explain the location and growth of rural industry should of course involve other factors than those already discussed: i.e. the structure of property rights and inheritance patterns, as well as the level of market integration etc.²² Our present aim is, however, not to find an overall explanation for the location and growth of Swedish rural industry in the nineteenth century. Instead our more narrow aim is to isolate the possible general effects of towns as providers and mediators of goods, market contacts, and different types of services and information.

The outline of this article is as follows. Before presenting our model and our analysis, we will relatively briefly discuss the different aspects of economic change that we, for the most part, will include in our analysis at a later stage. We will, however, devote somewhat more space to discussing the importance of urban service functions, which have not often been mentioned or studied in the case of Swedish industrialisation.

I

What was the opportunity cost for agriculture in the age of Swedish industrialisation? Sweden started from a very low level of agricultural production. By the early eighteenth century,

²¹ Magnusson, *An economic history of Sweden*; Petersson, 'Öfversikt öfver Sveriges inre vattenvägar'.

²² See e.g. overview in Thirsk, 'Industries in the countryside'.

arable land comprised only c. 2 per cent of total Swedish soil, while the average for Western Europe at the same time was c. 14 per cent.²³ During the eighteenth century, with increased importance in the latter part of the century, a number of institutional changes paved the way for major improvements in agricultural productivity and major increases in production and arable land.²⁴ This development also made a rapid population growth possible. The social consequence of this process was that the landless classes grew rapidly, while the peasant class (those with formal ownership of the land) was rather static. As in most other countries, a class of surplus labour for the use in agriculture, industry or services was created. Thus the relation between the peasant class and the landless should be an indicator of the availability of labour inputs for industry to use.

Whether the rural population used their labour in industry or in agriculture was, as suggested above, dependent on local conditions for either sector. A key factor was the amount and quality of arable land. In regions and parishes where arable agriculture dominated the landscape, the opportunity cost for massive investments in industrial production was high, and local resources were put to better use by intensifying agricultural production, not the least the production of grain. The conditions for agriculture were in general very different in the two studied regions. The Southeast was to large part composed of forest land, and fields were small and scattered. Areas in the Southeast with better conditions for crop growing were found along the coast of the Baltic Sea (including the island of Öland) and on the southern shore of Lake Vättern.²⁵ Moreover, previous research has shown that in the early nineteenth century specialisation in grain production was relatively common in parishes located near towns.²⁶ Mälardalen had in general more benign conditions for agriculture. Agricultural land was, however, concentrated to areas surrounding Lake Mälaren and Lake Hjälmaren. The main agricultural area was the county of Uppsala, where the plains were among the best agricultural soils in Sweden. The remaining parts of Mälardalen consisted of forest land.²⁷

²³ Gadd, *Den agrara revolutionen 1700-1870*, p. 26.

²⁴ Doving, 'The Transformation of European Agriculture', pp. 618-619; Magnusson, *An economic history of Sweden*, Chapter 1.

²⁵ Emigrationsutredningen and Stolpe, P., *Emigrationsutredningen*, pp. 42-54 & 59-61. Gadd, *Den agrara revolutionen 1700-1870*, pp. 23-42.

²⁶ Karlsson, *Mark och försörjning: befolkning och markutnyttjande i västra Småland 1800-1850*, Chapter 4, where the average of arable/acre was c. 20 per cent in parishes in proximity to towns and c. 10 per cent in distant parishes.

²⁷ Emigrationsutredningen and Stolpe, *Emigrationsutredningen*, pp. 21-35 & 93-100; Gadd, *Den agrara revolutionen 1700-1870*, pp. 23-42.

Whether an intensification of agricultural production took place over time depended not only on the quality and availability of grain, but also on the market for it. The development of urban or rural industry from the 1820s created incentives to specialise in agricultural production. Improved transports, especially by railways from the 1860s, together with foreign demand created additional opportunities for Swedish agriculture to be commercialised.²⁸

Compared to demographic, industrial and trade statistics, statistics measuring the structure and output of agriculture are of less solid and sometimes dubious quality.²⁹ Thus data measuring specialisation, commercialisation and opportunity costs will have to be rough proxies. The data in Table 1 shows the overall structure of these aspects of agriculture in the two regions.

Table 1. Average amount of arable land, social structure and taxation of arable land in rural parishes in the Southeast and Mälardalen 1820, 1850 and 1890.

The difference in access to and use of agricultural soils, and thus a proxy for the level of specialisation, is shown clearly by the level of arable land (compared to the amount of pasture) in the two regions. Mälardalen had a higher level and the growth in agriculture was evident already in the first half of the nineteenth century. Moreover the access to surplus labour was also better in Mälardalen than in the Southeast, as the proportion of landless to yeomen was higher at all times. One reason was that larger estates with many agricultural labourers, sometimes with payment in kind (*statare*), were more common in Mälardalen than in the Southeast. A decrease in the proportion of landless could be discerned in the 1890s, as a result of urbanisation, but also, especially in the Southeast, due to emigration. The tax value of arable land could be used as a proxy for the level of commercialisation, although differences in levels between the regions should be interpreted carefully.³⁰ We can, however, use the data to show that agricultural income increased slowly during the first half of the century, while increasing during the second half, thus acting as a proxy showing that commercialisation increased over time. It should be noted that there were also large

²⁸ From the 1850s to the 1880s Swedish agriculture exported considerable amounts of oats to Great Britain. Magnusson, *An economic history of Sweden*, p. 5.

²⁹ Svensson, *Jordbruk och depression 1870-1900: en kritik av statistikens utvecklingsbild*.

³⁰ Taxation on agricultural land as an indicator of the character of local agriculture has been used by e.g. Karlsson, *Mark och försörjning*; Martinius, *Agrar kapitalbildning och finansiering 1833-1892*; Peterson, *Jordbrukets omvandling i västra Östergötland 1810-1890*; Persson, *Regionala och lokala variationer i hemmansklyvning i Sverige under 1700- och 1800-talen*.

differences within the regions concerning the tax level between parishes with specialised agriculture and those without.

II

A key factor for the development of both agriculture and rural industry was the development of communication networks. In Mälardalen many parishes had access to lakes, streams and canals for transports, while waterways in general were lacking in the Southeast. The introduction of railways from the late 1850s improved communications and transports in general, but even more so for the Southeast. The railways are considered to have been decisive for Swedish industrialisation, not least by creating opportunities for a more geographically balanced growth.³¹ By the turn of the century Sweden had more railway mileage per capita than other European countries.³²

Access to railways was, however, not evenly distributed geographically. The construction of state funded trunk lines in 1860-80 left the Southeast with only one trunk line (in the western part of the region), while Mälardalen was intersected by three. A relative difference between the two regions was, however, that while the trunk lines in Mälardalen, contrary to the general policy, were drawn through or close to the major towns in the region, the trunk line in the Southeast was drawn where communications previously had been poor, thus creating new communication nodes where population agglomerations, often becoming towns, grew up.³³

From the 1870s private railways increasingly complemented the state funded trunk lines. The government, however, exerted an influence on the construction of private railways, since grants or loans from the state often were needed to finance larger projects.³⁴ Lines to the iron and mining districts in Mälardalen were encouraged by the loan policy of the Parliament. As a result the growth of private railways in the Southeast was slower than in Mälardalen. However, by the turn of the nineteenth century, both regions had more or less equal access to

³¹ Heckscher, *Till belysning af järnvägarnas betydelse*; Westlund, *Kommunikationer, tillgänglighet, omvandling: en studie av samspelet mellan kommunikationsnät och näringsstruktur i Sveriges mellanstora städer 1850-1970*.

³² Ville, *Transport and the developmen*, p. 129.

³³ Heckscher, *Till belysning af järnvägarnas betydelse*, p. 58.

³⁴ Oredsson, *Järnvägarna och det allmänna: svensk järnvägspolitik fram till 1890*.

railways.³⁵ Still a difference existed, in that most private railways in Mälardalen had been built with the same track width as the trunk network, while the private rail tracks in the Southeast were more narrow, which often required the reloading of goods.³⁶

Given that previous research has stressed the importance of communications for the development of the Southeast, it is likely that improved communications in general should be more important for the development of rural industry in the Southeast than in Mälardalen. The impact of communications should, however, vary between industries. For the extractive industries, more common in Mälardalen, improved communications facilitated contacts with a growing market for iron, not the least within urban industry, both locally and in general. Rural and urban development should then become increasingly complementary. For the non-extractive industries, improved communications and decreasing transport costs could be a double-edged sword: they created new opportunities to reach wider markets, but at the same time these industries faced growing competition from local and distant urban and rural industries.

III

Improved communications thus increased access to urban markets and services. What then were these markets and services? Urbanisation was late in Sweden. Until the 1850s, only about 10 per cent of the Swedish population lived in towns. Urban growth took off from the 1850s and became more pronounced from the 1880s. By 1900 c. 30 per cent of the population lived in towns.³⁷ Growth took place both in size and numbers.³⁸ Small towns grew faster than most large towns. Old commercial centres declined, while new industrialised towns emerged as major urban localities.³⁹ The railways also helped to reshape the structure, as small villages

³⁵ Järnvägsstyrelsen, *Sveriges järnvägar hundra år: SJ 1856-1956*, Appendix of maps; SCB, *Statistisk årsbok för Sverige*, Table 150. Railways in Mälardalen comprised 2,520 km and railways in the Southeast 2,526 km by the mid 1910s.

³⁶ Järnvägsstyrelsen, *Sveriges järnvägar hundra år: SJ 1856-1956*.

³⁷ Nilsson, *Den urbana transitionen: tätorterna i svensk samhällsomvandling 1800-1980*, p. 129, Figure 4.1.

³⁸ The number of incorporated towns and markets towns was 106 in 1850 and 116 in 1900. By 1900 a new form of formal urban agglomeration had been introduced: 'the municipality' which numbered c. 120. Nilsson, *Historisk tätortsstatistik*.

³⁹ Ahlberger, *Konsumtionsrevolutionen*; Bäcklund, *De svenska tätorternas storleksstruktur 1820-1970*, pp. 19-24.

intersected by or located close to a line became towns, while towns not located by the railways retreated into more village-like conditions.⁴⁰

This overall picture could also serve as a characteristic of urban development in Mälardalen and the Southeast. There were, however, important differences between the two regions regarding the structure of the urban system. Towns were more densely distributed in Mälardalen than in the Southeast. In Mälardalen more than 90 per cent of the rural parishes were located within 30 km of the most proximate town, while this was the case for less than two thirds of the parishes in the Southeast.

Another difference concerns the size of the individual towns. In the Southeast there were four large towns (Karlskrona, Kalmar, Jönköping and Karlshamn), while the other towns were quite small. In Mälardalen the towns were of more equal size than in the Southeast, with the exception of Stockholm. (See Appendix 2.)

The third difference was that the urban system of Mälardalen included Stockholm, the political and administrative capital of Sweden. Stockholm was also a commercial and financial node for the whole of eastern and northern Sweden. The Southeast lacked an urban environment of this magnitude. The whole of Mälardalen could thus benefit from the market and services provided by Stockholm. A relative problem in the early nineteenth century was that Stockholm had been the victim of half a century of economic and social decline, which changed into expansion only from the 1850s.⁴¹ The dominance of Stockholm could also have a negative effect on the other towns in Mälardalen, as the location of Stockholm right at the entry to Lake Mälaren as well as certain legal restrictions on other towns' trade gave Stockholm a central position as a distributive node for goods to and from the counties in Mälardalen.

In sum the parishes of Mälardalen had access to more and larger towns (not least Stockholm), than the parishes in the Southeast. This should have created better opportunities for positive urban-rural dynamics in Mälardalen than in the Southeast. However, the economic and social impact of Stockholm may have made the services of the other towns in

⁴⁰ It should be pointed out that the towns that Bäcklund, *De svenska tätorternas storleksstruktur 1820-1970*, as well as Swedish research into urbanisation in general, discuss are 'formal' towns, i.e. population agglomerations that had a town charter. Many, if not all, of the population agglomerations that underwent major growth in the nineteenth century came to receive town charters during the course of the nineteenth century.

⁴¹ Heckscher, *Till belysning af järnvägarnas betydelse*; Söderberg, Jonsson & Persson, *Stagnating metropolis: economy and demography in Stockholm, 1750-1850*.

Mälardalen less important. Contrariwise the general absence of towns in the Southeast may have made the usefulness of each and every town more important. The next step will be to discuss what functions the towns in Mälardalen and the Southeast possessed.

IV

As in other European countries, Swedish private and public services underwent a dynamic expansion during the nineteenth century.⁴² An increase in trade, financial services and information flows started in the 1820s, but became even more accentuated during the second half of the century.⁴³ In this study we have chosen to focus on three aspects of urban service functions: trade, banks and provincial newspapers.

Traditionally, trade has not been seen as an independent growth factor in Swedish industrialisation, with the exception of the iron and later the sawmill industry that were financed by wealthy merchants.⁴⁴ The indirect effect of trade on industrialisation has, however, been highlighted. Importance has been placed on the development of a market culture in relation to industry and proto-industry, as well as the liberalisation of trade from the 1840s.⁴⁵ Recent research on the structure and organisation of retail and wholesale trade in the nineteenth century has brought to light the existence of well developed connections between rural and urban traders on the one hand, and rural and urban producers on the other.⁴⁶ It also been shown that trade grew immensely after the Free-Trade Act in 1864, as urban trade grew by 140 per cent between 1865-1900, and rural trade grew by 240 per cent.⁴⁷

The development of a modern financial market with commercial banks and savings banks has been pointed out as being significant for the development Swedish industry, at least in the second half of the century.⁴⁸ The development of a modern financial market took off in the first decades of the nineteenth century. By 1820 Stockholm was the only town to have a

⁴² Shaw & Benson, *The evolution of retail systems, c. 1800-1914*; Hartwell, 'The Service Revolution: The Growth of Services in Modern Economy 1700-1914'; Kindleberger, *A financial history of Western Europe*.

⁴³ Magnusson, *An economic history of Sweden*; Schön, *En modern svensk ekonomisk historia: tillväxt och omvandling under två sekel*, pp. 115-6, 156 & 159-167.

⁴⁴ Magnusson, *An economic history of Sweden*, p. 115.

⁴⁵ Magnusson, *An economic history of Sweden*, pp. 70-9 & 115.

⁴⁶ Jonsson, *Marknadens väv: svenska mekaniserade bomullsväverier i distribution och försäljning 1850-75*; Sandgren, *Stationssamhället och varudistributionen*; Sandgren, *Åt var och en efter behov?: en studie av lanthandeln i Revsundsregionen i Östra Jämtland 1870-1890*.

⁴⁷ Sandgren, *Åt var och en efter behov?*, p. 27.

⁴⁸ Nygren, *Tendenser i större svenska sparbankers kreditgivning 1821-1914*; Petersson, *Framväxten av ett lokalt banksystem: Oppunda sparbank, Södermanlands enskilda bank och stationssamhället Katrineholm 1850-1916*, pp. 188-99.

formal credit institution of any kind. From the mid 1820s savings banks began to be established all around Sweden and by the second half of the nineteenth century commercial banks, saving banks and mortgage institutions had spread to most towns and to all parts of the country.⁴⁹ The importance of modern credit facilities should, however, not be exaggerated. Until the end of the nineteenth century, small industries were probably financed by local issue of shares, as well as by informal/personal credits.⁵⁰

With its agglomeration of people, towns have been important nodes for mediating information about commercial activities, labour and prices etc. In practice this included face-to-face interaction at market places, inns and pubs, but also the provision of information through local newspapers.⁵¹ By 1830, a third of Swedish towns had a newspaper. The existence of newspapers was at that point concentrated to towns characterised by a large public sector, i.e. towns with the seat of regional government, bishops, universities and the military, rather than by commerce or industry. Thirty years later two thirds of the towns had at least one newspaper.⁵²

Table 2 shows that Mälardalen in general was better endowed with service functions such as commerce, banks and newspapers than the Southeast. We have, however, also computed the service level for Mälardalen excluding Stockholm, which shows that the general difference between the two regions to a large part was explained by exceptional levels of trade, banking and newspapers in the capital city compared to other towns in Mälardalen. Thus, without Stockholm, the service level in the two regions was fairly equal. Growth over time was similar between the two regions. The relative level of traders developed slowly until 1870, the number of banks grew rapidly until 1870, while newspapers (discounting the growth in Stockholm) grew rather evenly over time.

⁴⁹ Wallerstedt, *Finansiärers fusioner: de svenska affärsbankernas rötter 1830-1993*, pp. 20-2.

⁵⁰ Lilja, *Marknad och hushåll: sparande och krediter i Falun 1820-1910 utifrån ett livscykelerspektiv*, pp. 46-58. Concerning the importance of merchant houses, see e.g. Müller, *The merchant houses of Stockholm, c. 1640-1800: a comparative study of early-modern entrepreneurial behaviour*, pp. 160-175 & 212-17; Fritz, *Från handelsstad till industristad 1820-1920*.

⁵¹ Berg & Hudson, 'Rehabilitating the industrial revolution'; Hudson, *The industrial revolution*, p. 102; Reeder & Rodger, 'Industrialisation and the city economy'; Pred, *Urban growth and the circulation of information*.

⁵² Nordmark, *Liberalernas segertåg (1830-1858)*, pp. 55-7.

Table 2. Service functions in towns in Mälardalen and in the South Eastern region 1820-90

In addition to Mälardalen being in general better endowed with service functions than the Southeast, we know that there was a qualitative difference between the two regions. Studies of Swedish nineteenth century trade have shown that the towns in Mälardalen were much more specialised than the towns in the Southeast by 1850, and that this difference continued around the turn of the century, even though specialisation had also grown in the towns in the Southeast.⁵³

V

Despite an ongoing urbanisation, Sweden remained mainly rural until the early 20th century, and compared to other European countries Swedish towns were relatively small. Swedish industry was to a large extent dependent on iron ore and wood, which could explain the rural characteristics of the industrialisation.⁵⁴ The only industry of major importance before the nineteenth century was the extraction and production of metals, relying increasingly on iron after the market and production of copper had fallen away in the 17th century. Iron mining and production was almost exclusively located outside towns, since it was here the basic resources (iron ore, water for energy and wood for making charcoal) were found. Iron mines and works were mostly found in central Sweden, and they were especially common in the counties of Mälardalen, while only a few existed in the Southeast. Aside from the metal industries, a number of smaller proto-industrial districts existed around Sweden. The rationale for this production was often a combination of access to raw materials (iron, wood), lack of good arable land, and tradition of skills. The main centres for proto-industry were textiles in the counties of Skaraborg and Hälsingland and metal and wood products in northern Scania, the southern and western part of the Southeast and in Dalarna. The only proto-industrial production of importance in Mälardalen was rural shoemaking in the county of Örebro.⁵⁵

Rural industries would also be important during industrialisation in the nineteenth century. One of the major sectors of growth was the wood industry/sawmills. The main development took place in Western and Northern Sweden, but small units of production were quite common in the Southeast. Iron production continued to be of importance, but the location did

⁵³Dahl, *Det svenska nätet av handelsorter*.

⁵⁴Gårdlund, *Industrialismens samhälle*; SCB, *Historisk statistik för Sverige. Yrkesfördelning 1751-1800 enligt Tabellverket och andra källor*; Schön, *En modern svensk ekonomisk historia*.

⁵⁵Magnusson, *An economic history of Sweden*, pp. 32-9.

not change much. Another dynamic sector was the textile industry. Until the 1850s most textiles industries were found in rural locations, but after which that they became increasingly urban. With the general advent of industrialisation from the 1850s, a wide range of industries, often small or mid-sized, such as grain mills, brick works, paper mills, and mechanical workshops, grew up in rural areas producing both consumption and capital goods.

The two studied regions followed the main patterns of the Swedish industrialisation. Table 3 shows that rural industry dominated in both regions, although urban industry exhibits the highest growth both in absolute and relative terms during the latter half of the nineteenth century, especially in Mälardalen.⁵⁶ Most rural parishes had a very small percentage of the population employed in industry. In both 1820 and 1850 c. 5 per cent of the parishes in both regions lacked industries and even artisans of any kind.

⁵⁶ It should be noted that our calculations of the regional (county) level of industry for 1870 and 1896 to a certain extent differ from data presented in previous research. The main reason is that our definition of the industrial work force includes male and female workers, assistants (betjäning) and servants (hjon), while not including urban crafts. In Riemer, Gårdlund, Palander, Klintholm & Isbell, *Population movements and industrialization: Swedish counties, 1895-1930*. Table 1 (where the definition is not crystal clear), the authors seem to have included wives and children when computing the industrial work force. Malmberg, *Industrisystemens regionala utveckling 1870-1980* has included urban craftsmen, but not industrial servants or 'agrarian' industries such as sawmills, flourmills etc.

Table 3. Industrial employees in urban and rural parishes in Mälardalen and the Southeast, 1820, 1850, 1870 and 1890, in number and per cent

Maps 1-3 show the level of industrial employment for individual parishes. In 1820 flourmills were the most common industry in both regions. Nearly two thirds of the rural parishes had a mill, but these were small facilities with on the average only three employees. The largest industrial establishments were to be found among the metal works and the mines, with c. 50 per cent of the total number of industrial labourers, but these were more common in Mälardalen than in the Southeast.⁵⁷

Over time the industrial structure in both regions became more diversified, as production related to domestic demand became increasingly important. One aspect of this development is that textile industries grew considerably between 1820 and 1850 in both regions. Other expanding industries were brickworks, paper-mills, sawmills, breweries and leather industries. Of these, the former three were of greater importance and showed more rapid growth in Mälardalen than in the Southeast, whereas the opposite was the case for the two latter industries.⁵⁸

By 1890 some kind of industry could be found in every parish. The most important sectors in both regions, measured by number of employees, were the wood industries and the stone and clay industries which both employed c. 30 per cent of the total industrial labour, while the third largest industry was metal manufacturing. The relative importance of metal works and mineral mines for industrial employment had then decreased.⁵⁹ The diversification of industry was also geographic, although regions with higher levels of industrial employment showed a certain concentration. This was especially the case in the Southeast, where rural industry came to be concentrated to areas surrounding the towns of Jönköping (metal manufacturing, iron industry, and match factory), Västervik (paper mills and breweries) and Kalmar (glass-works, iron-works, paper mills). All three towns had good access to sea transports, Västervik and Kalmar by being located on the coast and Jönköping through access to inland waterways, but also to the railway as the Southern trunk line passed through Jönköping.⁶⁰ By the 1890s the

⁵⁷ DDB, Table Commission.

⁵⁸ DDB, Table Commission.

⁵⁹ BiSOS D 1896. Due to changes in the construction of the industrial statistics, it is impossible to make a systematic comparison between the industrial structure c. 1850 and the industrial structure in the 1890s.

⁶⁰ Lake Vättern and the Göta Canal, stretching from the East coast to the city of Gothenburg on the West coast.

industrial development in the Southeast thus had a more nodal character than did industry in Mälardalen.

Map 1. The percentage of rural industrial labour compared to total parish population and total town population in Mälardalen and the Southeast 1820

Map 2. The percentage of rural industrial labour compared to total parish population and total town population in Mälardalen and the Southeast 1850

Map 3. The percentage of rural industrial labour compared to total parish population and total town population in Mälardalen and the Southeast 1890

VI

The complexity of the interaction between economic, institutional, geographic, and social factors explaining the development of industry is difficult to capture with formal models. It is, however, not our immediate purpose to explain the development of industry in general. Our purpose is to grasp whether access to urban service functions in the most proximate town was correlated to the level of rural industry in the hinterland. However, in order to test the importance of urban service functions, we need to specify a model that incorporates as many relevant variables as possible that could influence the level of rural industry. For this analysis, we have chosen to limit ourselves to two basic sets of explanatory factors. One set consists of indicators of access to parish specific resources for industrial production, agricultural production and marketing, while the other set of variables are indicators of access to urban service functions in the town most adjacent to each individual parish. We have also included region as an independent variable in order to measure the eventual difference between the two studied regions. The set of parish specific variables includes indicators of access to communications, rural labour surplus, agricultural specialisation and access to raw materials, while the set of variables for urban service functions includes indicators of distance, access to commerce and to information, the size of the urban market and the level of urban industry.

In order to assess in what way urban service functions may have had a general effect on rural industrial employment, we will compare two models, one with and one without urban service functions. Using the GENMOD-procedure in SAS 9.1, we have applied a generalised linear modelling (GLM) framework assuming a poisson error distribution and a log link.⁶¹ For

⁶¹ McCullagh & Nelder, *Generalized linear models*; Olsson, *Generalized linear models: an applied approach*.

each type of industry (total rural, extractive, non-extractive) and year (1820, 1850, 1890), we fitted two models: one including only indicators of parish specific variables (ore, agricultural labour, access to port and railway), and one where indicators of urban service functions (distance to the nearest town and its population, industry, trade and access to information) were added. By comparing the goodness-of-fit between the two models, we will be able to see whether a model including indicators of urban service functions has a better explanatory power for variations in the dependent variable, than a model without these variables. If models including urban service functions always have a better explanatory power than other models, the conclusion must be that we have found a general effect of urban service functions on rural industry.

The dependent variable is the proportion (through the log link) of industrial labourers in relation to the total population of each rural parish (RURALIND).⁶² The independent variables indicating parish specific characteristics are then comprised of 1) ORE, a dummy indicator of access to raw materials⁶³, where 0 = no access to ore and 1 = access to ore⁶⁴; 2) AGRLAB, an indicator of rural labour surplus computed as the ratio of the absolute number of landless/tenants to farmers in each parish⁶⁵; 3) ARABLE, an indicator of agricultural specialisation computed as the percentage of arable land to total acreage⁶⁶; 4) PORT, a dummy variable measuring access to communications (waterways and ports) within each parish, where 0 = no access and 1 = access⁶⁷; 5) RAILWAY, a dummy variable measuring

⁶² Data for 1820 and 1850 have been collected from *Tabellverket* (the Table Commission). Data for industry and crafts in the rural parishes in 1890 have been collected from the primary material for the Swedish census of these years (RA, SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', HIba: 23-5 & 27). See also the Appendix 1.

⁶³ Since access to waterpower and timber in the two regions can be regarded as so abundant that it hardly would restrict location, we have chosen to leave these out from the model. Lindberg, 'An economic-geographical study'.

⁶⁴ Access to ore is present if the parish at any time in the nineteenth century was registered as having been the location of mining according to data from statistics on mineral extraction. BiSOS C Bergshantering 1835-90.

⁶⁵ Data for 1820 and 1850 from the Table Commission, and data for 1890 from the census of 1890. (RA, SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', HIba: 23-5 & 27). Landless/tenants are those groups that were landless or rented land and farmers those that owned land. In both cases we have excluded women, children and males that were deemed not fit for labour. Landless/tenants include: *jordtorpare, statorpare, arbetsföre backstugusittare, arbetsföre inhysesjon*. Peasants include: *självägande bönder, hemmansägare, landbönder, arrendatorer*. For grouping, see also e.g. Karlsson, *Mark och människor: befolkning och försörjningsresurser i västra Småland 1800-1850*; Gadd, *Järn och potatis: jordbruk, teknik och social omvandling i Skaraborgs län 1750-1860*.

⁶⁶ Emigrationsutredningen and Sundbärg, *Emigrationsutredningen*, Table 71, 1805 and 1905; Kommittébetänkande, *Underdånigt betänkande af den för undersökningar angående stambanornas lämpligaste sträckning i nåder tillförordnade komité*.

⁶⁷ Access to a port is based upon whether the rural parish had direct access to the sea, lakes, navigable rivers or canals. This data is available for all years. The source has been maps.

access to communications (railways) within each parish, where 0 = no access and 1 = access⁶⁸. A special note must be made about our way of measuring access to ores. We have decided to code a parish as having access to ores in the case there was, had been or would be a mining industry in the individual parish during the nineteenth century. A relevant objection is that a previous or future mining industry cannot possibly explain why the parish had rural industry at another point in time. This objection can, however, be countered by the following arguments. In many parishes, mining and iron production co-existed at a certain point in time. In parishes where the mining industry was closed down, iron production often continued. Moreover, new mines that were established during the course of the nineteenth century were often located in parishes adjacent to existing or previous mining regions. In this sense the ORE variable could also be treated as a crude indicator of both path-dependency and the economics of agglomeration.

A separate independent variable is 6) REGION, included in order to assess the effect of region, where 0 = the Southeast and 1 = Mälardalen.

The independent variables indicating urban service functions are comprised of 7) DISTANCE, an indicator of access to urban service functions in general, measured as distance⁶⁹ in km (ln-transformed) to the most adjacent town; 8) URBPOP, an indicator of the general size of market, measured as the total population (ln-transformed) of the most adjacent town⁷⁰; 9) URBIND, an indicator of the level of urban industry, measured as the percentage of industrial workers compared to total urban population in the most adjacent town; 10) URBTRADE, an indicator of access to commercial services, measured as the percentage of traders and their employees compared to the total urban population in the most adjacent

⁶⁸ Access to railways has only been collected for the year 1890, as a railway system did not exist in 1850. Again the source is maps combined with data on railway employees in the rural parishes from the Swedish census (RA, SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', HIba: 23-5 & 27). Järnvägsstyrelsen, *Sveriges järnvägar hundra år: SJ 1856-1956*.

⁶⁹ The distance from the nearest town to the centre of the parishes in the hinterland of each town has been computed by using the scale-tool available in the MapInfo-mapping programme, based on data from *Lantmäteriet* (the Swedish Surveyor Service). The distance used is the distance 'as the crow flies', i.e. a straight line from the town centre to the parish centre.

⁷⁰ Data for the population in towns and urban districts have been collected from printed tables in Swedish urban historian Lars Nilsson's collection of urban population data. Nilsson, *Historisk tätortsstatistik*. Population data for the rural parishes have been collected from primary data. For 1820 and 1850 we have used data from the Table Commission. For 1890 we have used data from the Swedish census of these years. The data on population in the rural parishes in 1890 are formally found in '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', HIba: 23-5 & 27. See also Appendix 1.

town⁷¹; 11) NEWS, a dummy variable for access to information, measured by access to newspapers where 0 = no access to newspaper and 1 = access⁷². In the process of setting up the models, we have collected data on additional variables, which however have been excluded due to multicollienarity.⁷³

The hinterland of each town has been defined as those parishes most adjacent to each town, where distance has been measured as the distance from the centre of each parish to the centre of each town. What is considered hinterland is thus relative, relying on the density of the urban system and not on the size of the town, which differentiates our definition of hinterland from the definition common in central place models.

In the first regression model, the level of rural industry comprises all types of industry. However, in an effort to determine the importance of geographical constraints, we analyze *extractive* industries⁷⁴ – comprising mining and the metal (iron) works – and *non-extractive* industries⁷⁵ – comprising all industries other than mining and the metal works – separately. The level of urban industry could influence the development of industry in the hinterland negatively or positively, depending on whether the industries in the town and the hinterland were complementary or competing. The level of trade should reflect what kind of distribution system each town could provide for the rural industry. The higher the level of trade, the better access to more developed commercial functions the town should be able to provide, which in turn should improve the flow of goods to and from the hinterland. The percentage of traders and their employees as an indicator for trade were assumed to reflect the size of trade. While information in the pre-industrial economy to a large extent was linked to personal networks, during the nineteenth century information became increasingly formalised and more available through the development of newspapers. We have used a rather rough indicator of the level of information, the number of newspapers published in each town, since aggregate data on the

⁷¹ Trade is measured as the percentage of trade in relation to the town population. The data for trade has only been collected for the towns. In 1820 and 1850 we have used data from the Table Commission, and in 1890 (the data is really from 1896) data from the printed statistics (BiSOS E & F).

⁷² Information is here measured as a dummy variable coded as access to a local newspaper or not. Information on published newspapers is found in a geographic register of Swedish local newspapers kept at the University Library of Uppsala, Carolina Rediviva. The register is sorted after town and gives information on the names of newspapers and during which periods they were published.

⁷³ We intended to use taxation value on agricultural land in rural parishes as a proxy for commercialisation and the number of banks in towns as a proxy for financial services.

⁷⁴ Industries included in 'extractive' industries are mining and the metal works.

⁷⁵ Industries included in 'non-extractive' industries are all industries except mining and the metal works, e.g. the textile, food and leather industries, sawmills, metal manufacture and brickworks.

circulation of newspaper is not available.⁷⁶ As the residual error of the models fitted was higher than the one assumed by the Poisson distribution, an overdispersion parameter was calculated. We scaled the standard errors using the square root of the Pearson chi-square dispersion (the SCALE; DEVIANCE-command in SAS/GENMOD). The coefficients are identical to the previous analysis, but the standard errors are adjusted to compensate for the overdispersion in the Poisson distribution so the standard error would not be underestimated. The resulting scaled Pearson chi2-estimate was then divided by the degrees of freedom for each model and used as an approximate guide to the goodness of fit of a given model.⁷⁷

VII

A general result from the analysis of the different GLM-models is that models where variables on urban service functions are included only in some cases (Table 4) give a better fit than those without. This means that we can not find a general effect of urban service functions on the level of rural industry in the two regions. Moreover, as shown in Table 4, the change in goodness-of-fit when variables on urban service functions are introduced is in general very small, which suggests that even when there was a statistically significant effect of towns on rural industry the effect was rather small. The comparison of goodness-of-fit also shows that none of the models for extractive industry in 1820 and 1850 are statistically significant. The reason for this is that the model became too skewed due to several outliers at both ends of the sample. It should also be noted that the most evident effect of urban service functions is shown in the models for the non-extractive industries, thus suggesting that the provision of urban services mattered for these types of rural industries, more than was the case for industry in general.

Table 4. Comparison of goodness-of-fit between generalised linear models based on parish and parish and urban variables for explaining rural industrialisation in two Swedish regions in 1820, 1850 and 1890.

⁷⁶ In preparing this article we have also collected information on other town specific variables, most importantly the number of credit facilities (an indicator of access to credit) and the number of members in popular movements (an indicator of access to information). These were not used in the analysis, as they were auto correlated in the first case with the relative number of traders and in the second with population and urban industry.

⁷⁷ McCullagh & Nelder, *Generalized linear models*.

What factors did then influence the level of rural industrial employment? In Table 5 we have chosen to present only the models which had the best goodness-of-fit and base our interpretation on those.

For the models with total rural industrial employment, the inclusion of urban service functions created a better goodness-of-fit only in 1890. As shown in Table 5 this, however, does not mean that any of these variables showed any real significant effect. Instead the most important factors for the level of total industry was access to ore, the amount of arable land, region and in 1890 also access to communications. The effect of REGION thus shows that there were significant differences in the level of industry between the two regions. The effect of ORE shows that industry was more common in parishes with access (past, present or future) to metal ores, while parishes with a high percentage of arable land had less chance of having rural industry, although the effect was less pronounced. The effect of access to a labour surplus was in general positive for the chance of having rural industry, but only significant in 1850 and of little effect. An evident positive effect was shown for access to ports and railway in 1890, which clearly indicates that improved communications mattered for industry in general.

Table 5. Parameter estimates and standard errors (std) for the generalized linear models of rural industrialization with best goodness-of-fit for explaining rural industry in two Swedish regions 1820, 1850 and 1890

The result of the analysis of extractive industries was disappointing, since only the model for 1890 showed a decent goodness-of-fit. The model for 1890 showed, however, the same type of effects as the models for total rural industry in general and the model for 1890 in particular. Even the extractive industries seem thus to have benefited from access to communications. That extractive industries were dependent on access to ore is almost self-evident. The result should then be interpreted as extractive industries in general having little to gain from the services the nearest town could provide. Instead present or historical access to ores and access to ports and railways increased the chances for the survival of extractive industries in rural parishes, at a time when urban industry developed rapidly. The result fits well with the organisation of the distribution of ores and crude metal products, which were either exported or used as inputs in urban industries outside the immediate region where the extractive industries were situated. This made the large port towns in the region, especially

the capital city of Stockholm but also some of the major port towns on Lake Mälaren and the Baltic coast, the main places for the exchange of goods, finances and information.⁷⁸

The results of the analysis of non-extractive rural industrial employment differ in many ways from the results of the other model. Most importantly it is only here that urban service functions show significant statistical effects, although they are for the most part quite small. For the non-extractive industries the model including urban service functions always has a better goodness-of-fit, than does the model without. The only stable significant effect is, however, geographic distance, showing that proximity to a town increases the chance for locating non-extractive industry in the parish. Otherwise the level of urban trade was in general positively correlated with non-extractive industry, although not significantly in 1850, while urban industry had a weak positive effect in 1850, and access to information a negative effect in 1820. The latter is, however, possibly due to the fact that newspapers in the 1820s were foremost found in towns dominated by the public sector, where the newspapers had little to report on trade and industry. The positive effect of trade suggests that rural industry could use the services for both inputs and outputs that urban tradesmen could provide. Contrary to total and extractive industry, access to ore was only positively significant in 1820. This suggests that over time, as non-extractive industry grew and diversified, the dependence on or co-location of traditional industry decreased. It should also be noted that a surplus of rural labour was positively correlated with non-extractive industry. As many occupations in these new industries were either easy to learn or were more or less to the same as already existing skills within the rural population (wood cutting, brick-making, milling), it appears to have been possible to recruit rural landless people as labour.

Thus the general conclusion is that the effects of urban service functions on rural non-extractive were small. In contrast to extractive industry, however, non-extractive industry benefited to a certain extent from being located close to a town and having access to the services of urban trade and the possible demand and output of urban industry. The positive relation between rural and urban industry in the nearest town suggests that the general effect was complementary rather than competitive. It should also be noted that the size of the market in general, measured by total urban population, in no case seems to have had an effect on rural

⁷⁸Heckscher, *Sveriges ekonomiska historia från Gustav Vasa*, pp. 92-106, Montelius, *Västerås genom tiderna: monografi*, pp. 357-58.

industry in the studied regions. Instead, access to commercial services and industrial demand and inputs were more important. A possible interpretation is that local commerce and industry to some extent serviced non-extractive industry, acting as relays to a wider market or as buyers or purveyors of industrial goods. The main markets thus lay elsewhere, making good access to communications important.

VIII

The main finding of the study is that the general dynamic influence of towns highlighted in many British studies cannot be found in the Swedish regions of Mälardalen and the Southeast during the nineteenth century. Despite an overall increase in trade, financial services and information during the nineteenth century, Swedish towns did not in general serve as stimulating relays for rural industry. An actual effect of access to urban services became evident only in the 1890s. An important reason for this was that a concentrated growth and specialisation of urban services only developed in earnest from the 1860s.

During most of the nineteenth century, it was parish specific factors such as access to ores, specialisation in grain production, access to communications and to some extent the supply of surplus rural labour that could be discerned as decisive for rural industry. The relation between towns and the rural hinterland differed, however, between different types of industries. Provincial towns near extractive industry, mines and iron works, had little to offer extractive industry, where instead parish specific variables were of great importance. The models without town variables showed the best fit for all the years studied. This suggests that the extractive industries that produced mostly for foreign markets relied more on contacts with Stockholm and the main Baltic and Atlantic ports towns than on contacts with the local town. Contrariwise, non-extractive industries, e.g. textile factories, saw mills, flour mills, paper work and brick works, appear to have gained from being close to a town. Thus, during these initial phases of Swedish industrialisation, industries catering to domestic demand were to a certain extent supported by the development of urban market and services.

The establishment of railways had a dynamic effect on rural industries. However, the effect of railways was not general. The extractive industries benefited more from access to ports and waterways than the non-extractive industries. In the process the location of rural industry in the Southeast came to be concentrated to a few areas surrounding towns with good inland and

waterway communications, while rural industry in Mälardalen was very evenly distributed by the 1890s.

Hence, the relation between towns and rural industry in their hinterland was both complementary and competitive, but possibly increasingly competitive over time. Although urban services and markets did not have any strong general relation to rural industry, this does not mean that urban service functions did not matter. As the analysis in this article is limited to the correlation between individual towns and their respective hinterland, the model does not capture the links between rural industry and the entire urban system. The general result that proximity did not always matter could instead be rephrased: it was distance that did not matter. The evident positive effect that access to railways, ports and waterways created facilitated for rural industries to expand their geographical networks for markets, services and inputs, which in turn was simultaneously both a cause and effect of specialisation within the urban system. Industrialists close to smaller towns probably choose to market and finance their goods in larger and more distant towns. It was probably the case that the service functions, markets and demand in many towns were not sufficient to support a profitable industrial business. In this sense Swedish business had to learn, already from the early nineteenth century, how to market and distribute goods over a large territory – an experience that could possibly be one reason behind the relative ease with which companies such as L. M. Ericsson (the forerunner to Ericsson) and ASEA (the forerunner to ABB) went international in the early 20th century.

Appendix 1: Some comments on sources and methods

The sources for population, industrial workers, yeomen and landless in the parishes have been the Table Commission (*Tabellverket*) and SCB (*Statistiska Centralbyrån*, the Central Bureau of Statistics). The material from the Table Commission (*Tabellverket*) is an extraordinarily detailed source with information about population, mortality, diseases and occupations in Swedish urban and rural parishes between 1749 and 1859. The information was collected every fifth year. The parish priests collected the information by filling out pre-printed forms, which were subsequently sent in to the Table Commission. The filled-in forms are now also available on the Internet.⁷⁹ When SCB (*Statistiska Centralbyrån*, the Central Bureau of Statistics) took over the responsibility for collecting population and occupational statistics, the organisation of the recording changed.⁸⁰ One result, which creates a problem for our study, is that it becomes impossible to separate industrial workers from craftsmen (which can be done in the data of the Table Commission). To solve this problem, we have chosen to regard both industrial workers and craftsmen as industrial labourers in the rural parishes for the whole period. This is, however, not only a technical solution. Overall, it also reflects the character of rural industry. Many rural crafts were more similar to rural industry than to urban crafts, and it is difficult to differentiate between crafts and industry in rural districts regarding level of technology, organisation of work, and market connections.

We have used the Table Commission and SCB to collect data on rural population and industry. The data from the Table Commission is the best source available for quantifying the level of rural industry – or for that matter any occupation – for the period 1749-1859, while the data from SCB⁸¹ is better than data from Royal Board of Trade (*Kommerskollegium*) where rural industry is concerned. A problem with both these sources is that they probably underestimate the importance of proto-industrial production, especially the contribution of

⁷⁹ Fritzell, 'Yrkesfördelningen 1825-1835 enligt Tabellverket och andra källor'; Fritzell, 'Yrkesfördelningen 1805-1820 enligt tabellverket och andra källor jämte sammandrag intill 1855'; SCB, *Minnesskrift med anledning av den svenska befolkningsstatistikens 200-åriga bestånd*; The Demographic Data Base, Umeå University, <http://www.ddb.umu.se/visualisering/Tabverk/Start>. The pre-printed tables were changed for the last time in 1821. The change made 1821 was so small that it only marginally affects the comparison between 1820 and 1850.

⁸⁰ The data on population and industry in the rural parishes in 1890 is formally found in; RA, SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', HIba: 23-5 & 27.

⁸¹ The primary data on population and industry in the rural parishes in 1890 is formally found in; RA, SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', HIba: 23-5 & 27.

made by women and children, as any kind work done within agricultural households was recorded as agricultural, not industrial, employment. The reason is that individuals were listed under the occupation assumed to be the main employment, and proto-industrial production was in general only a supplement to agricultural incomes. Also rural crafts seem to be underestimated from 1805, when only those who had formal permission as parish crafters were registered.⁸² The main problem with data from the Royal Board of Trade is that before 1896 important rural industries such as sawmills, flourmills, and brickworks, which were considered to belong to the agricultural sector, were not included in the industrial statistics, nor were they recorded in the agricultural statistics.⁸³ Hence, the Table Commission and SCB are better sources for rural industry.

It is, however, important to acknowledge other problems concerning the data from the Table Commission available through the website of the Demographic Data Base (DDB) at the University of Umeå. The most important problem is that data from several parishes are missing in the Table Commission data up until 1860.⁸⁴ In order to make up for the missing data, we have taken two steps, with the aim that the number of missing cases should not exceed c. 10 per cent for each county. Firstly, we have used data from the next census (either 1825 or 1855) in the DDB for the missing parishes.⁸⁵ Secondly, if data for 1825 or 1855 were missing, we have used available primary data found in regional archives.⁸⁶ The result has been a rate of missing cases of at most 12 per cent for each county. (See Table A)

Table A. Number of parishes in data base and rate of missing cases in relation to all existing parishes in the Mälardalen region and the Southeast, 1820 and 1850

Another, but lesser, problem is that over time both the Table Commission and SCB have summarised data for two or more individual parishes into parish groups, thereby making it

⁸² Gadd, *Självhushåll eller arbetsdelning?: svenskt lant- och stadshantverk ca 1400-1860*, pp. 132ff.

⁸³ The forms for reporting to the Royal Board of Trade (Kommerskollegium) changed on several occasions in the second half of the nineteenth century. Brick works were reported from 1873; flourmills, sawmills, shipyards etc. were added in 1896.

⁸⁴ In the primary material from the Table Commission, those employed in industry can be found under the heading IV Art. §k in 1820 and IV Art. §h 1850. Wives and children are found under IV Art. §l in 1820, while wives are found under IV Art. §h and children under IV Art. §p in 1850.

⁸⁵ Data for 19 parishes in 1820, and 17 parishes in 1850.

⁸⁶ As there is no overview of missing data on the DDB website, we do not really know why we succeeded in finding material from parishes missing on the DDB database. One reason is probably that the kind staff at the regional archives was willing to let us handle material that was more or less severely damaged. Data from parish archives has been used in 26 cases for 1820 and in 17 cases for 1850.

impossible to discern whether the individual parishes differed regarding the level of industry.⁸⁷ In our material this mostly affects the data for the counties of Kronoberg and Jönköping. In 1870 (concerning the SCB data) the problem was, however, of such a magnitude (mainly that parishes recorded together in many cases were situated in opposite parts of the county, making even the creation of larger groups of parishes that were geographically proximate impossible) that we chose to exclude 1870 in the regression analysis.⁸⁸ In the regression analysis we have included the data of these parish groups as a mean value of the whole group, giving fewer observations than the earlier studied years.

As mentioned, the data recorded by the Table Commission is very comprehensive and also very detailed. This means that one can find many categories of industrial workers and craftsman in data for 1820 and 1850. Concerning rural craftsmen we have chosen to include both masters and apprentices.⁸⁹ Concerning industrial workers, we have chosen to include the categories clerk, master, journeymen and servants, as well as male and female workers, but have excluded owners of industry, wives, and other family members.⁹⁰

Data for the population in towns and urban districts has been collected from printed tables in Swedish urban historian Lars Nilsson's collection of urban population data.⁹¹ Data for 1820 and 1850 have been collected from the Table Commission. The collection of data for 1870 and 1890 differs from that of industrial labour in the rural parishes. Data for industrial employees in the towns has been collected from the primary data for the Swedish industrial statistics⁹² Urban industrial labour is measured as the percentage of urban industrial workers, not craftsmen, in relation to the town population. The reason is that urban crafts, in contrast to rural crafts, differed more distinctly from urban industry. Urban crafts relied to a greater extent on handicraft technologies, a household/guild-like organisation of work and the local urban market than did urban industry. Moreover, many small coastal towns would have had a

⁸⁷ See also Lundh, *Den regionala befolkningsstatistiken i Tabellverket en databeskrivning*, pp. 7-8.

⁸⁸ Another problem for the data of 1870 is that 25 per cent of population was registered as unspecified agricultural workers. The real number of industrial labourers should probably be higher, which means that the real increase between 1870 and 1890 is lower. Fritzell, 'Yrkesutövare år 1870', p. 491.

⁸⁹ The Table Commission, IV Art. Σ § g in the sheets for 1820 and 1850.

⁹⁰ In the primary material from the Table Commission craftsmen and apprentices can be found under the heading IV Art. §g both in 1820 and 1850. Wives and children are found under IV Art. §l in 1820, while wives are found under IV Art. §g and children under IV Art. §p in 1850.

⁹¹ Nilsson, *Historisk tätortsstatistik*.

⁹² RA, Kommerskollegiums arkiv, Kammarkontoret, Fabriksberättelser serie 4, städer.

high level of industry if crafts were included, as fishing was included under 'crafts' in the statistics.

The Swedish statistics for agriculture are problematic. Statistics on harvests, crops and stockbreeding are highly unreliable. To get around the problem, we have used the level of arable land in per cent of total acres⁹³ as a crude measure of specialisation in agriculture and taxation of agricultural property as a measure of production capacity. It should, however, be noted that the taxation value of agricultural property captures incomes from many types of economic activity by the tax payer, not solely grain production. From the 1820s legally the taxation was to fluctuate with the market price, but the regional variations in prices to base the taxation on appear to have varied, and until the 1860s the taxation often seems to have been mainly undervalued.⁹⁴ Local comparisons with market prices, however, indicate that taxation and the relative change in taxation is possible to use as a crude measure of commercialisation in agriculture.⁹⁵ In our study on the parish level, the development of taxation per hide varied greatly over time between parishes in the same region.

⁹³ Emigrationsutredningen and Sundbärg, *Emigrationsutredningen*, Table 71, 1805 and 1905. Kommittébetänkande, *Underdånigt betänkande angående stambanornas lämpligaste sträckning i nåder tillförordnade komité*.

⁹⁴ Adamson, *Järnavsättning och bruksfinansiering 1800-1860*; Hultqvist, *Försvar och skatter: studier i svensk riksdagspolitik från representationsreformen till kompromissen 1873*; Persson, *Regionala och lokala variationer i hemmansklyvning*.

⁹⁵ Martinius, *Befolkningsrörlighet under industrialismens inledningskede i Sverige*; Martinius, *Agrar kapitalbildning och finansiering 1833-1892*; Peterson, *Jordbrukets omvandling*; Pettersson, *Laga skifte i Hallands län 1827-1876: förändring mellan regeltvång och handlingsfrihet*.

Appendix 2: Towns in the studied regions

Table B. Urban population in Mälardalen and the Southeast 1820, 1850 and 1895

Sources and literature

Sources

The National Archives of Sweden (RA)

Urban industrial statistics (Kommerskollegiums arkiv, Kammarkontoret, Fabriksberättelser serie 4, städer).

Population census 1890 (SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning').

Landsarkivet i Uppsala (ULA)

Parish archives, Statistical Tables (Statistiska tabeller).

Parish/year

Almby 1820 & 1850.

Alsike 1855.

Bälinge 1820 & 1850.

Dingtuna 1820 & 1850.

Ekeby 1820 & 1850.

Götlunda 1820 & 1850.

Hovsta 1850.

Knivsta 1825.

Kvistbro 1820.

Lilla Malma 1825.

Löt 1820 & 1850.

Nora Bergsförsamling 1850.

Rasbokil 1820.

Sala landsförsamling 1820.

Toresund 1820 & 1850.

Uppsala-Näs 1820.

Västerås Lundby 1820.

Stockholms stadsarkiv (SSA)

Parish archives, Statistical Tables (Statistiska tabeller).

Parish/year

Bro 1850.

Bromma 1850.

Edsbro 1820.

Gottröra 1820.

Håtuna 1850.

Hölö 1820.

Lidingö 1820 & 1850.

Låssa 1820 & 1850.

Malsta 1825.

Muskö 1825.

Möja 1825.

Mörkö 1820 & 1850.

Salem 1820.

Sollentuna 1825.

Spånga 1820.

University of Umeå, Demographic Data Base (DDB)

The Table Commission, Population statistics (Tabellverket på nätet)

(<http://www.ddb.umu.se/visualisering/Tabverk/Start>).

University library of Uppsala (Carolina Rediviva)

Topographic register of Swedish local newspapers 1750-1890.

Printed sources

BiSOS A 1870, 1890 and 1896 (Population statistics).

BiSOS D 1896 (Industrial statistics).

BiSOS E 1870 and 1890 (Domestic shipping and trade statistics).

BiSOS F 1896 (Trade statistics).

Nilsson, Lars (1992), *Historisk tätortsstatistik* Del 1.

Sveriges Bankmatrikel (1896), Stockholm.

Sveriges Handelskalender (1868/69), Stockholm.

Literature

Abbott C., 'Frontiers and Sections: Cities and region in American Growth', *American Quarterly*, 37 (1985), pp. 395-410.

Adamson R., *Järnavsättning och bruksfinansiering 1800-1860* (Göteborg, 1966).

Ahlberger C., *Konsumtionsrevolutionen* (Göteborg, 1996).

Bácskai V., 'Small towns in eastern central Europe', in P. Clark, ed. *Small towns in early modern Europe* (Cambridge, 1995), pp. 77-89.

Berg M., *The age of manufactures: industry, innovation and work in Britain 1700-1820* (Oxford, 1985).

Berg M. & Hudson P., 'Rehabilitating the industrial revolution', *Economic History Review*, XLV:1 (1992), pp. 24-50.

Bäcklund D., *De svenska tätorternas storleksstruktur 1820-1970* (Umeå, 1994).

Cerman M. & Ogilvie S.C., *European proto-industrialization* (Cambridge, 1996).

Chalklin C.W., *The rise of the English town, 1650-1850* (Cambridge, 2001).

Christaller W., *Central places in southern Germany* (Englewood Cliffs, N.J., 1966).

Clark P., *The transformation of English provincial towns 1600-1800* (London, 1984).

Clark P. & Lepetit B., 'Introduction', in P. Clark, & B. Lepetit, eds., *Capital cities and their hinterlands in early modern Europe* (Aldershot, 1996), pp. 1-25.

Corfield P.J., *The impact of English towns 1700-1800* (Oxford, 1982).

Cronbladh Å. *Sparbankerna i Sverige 1820-1992* (Stockholm, 1993).

Dahl S., *Det svenska nätet av handelsorter* (Göteborg, 1965).

Dovring F., 'The Transformation of European Agriculture', in M. M. Postan, & H. J. Habakkuk, eds., *The Cambridge economic history of Europe* (Cambridge, 1965), pp. 604-72.

Ellis J., 'A dynamic society: social relations in Newcastle-upon-Tyne 1660-1760', in P. Clark, ed. *The transformation of English provincial towns 1600-1800* (London, 1984), pp. 190-227.

Ellis J., ed. *Regional and county centres 1700-1840* (Cambridge, 2000).

- Emigrationsutredningen & Stolpe P., *Emigrationsutredningen* (Stockholm, 1912).
- Emigrationsutredningen & Sundbärg G., *Emigrationsutredningen* (Stockholm, 1910).
- Fogel R.W., *Railroads and American economic growth: essays in econometric history* (Baltimore, Md., 1964).
- Forsell C.A., *Socken-statistik öfver Sverige* (Stockholm, 1834).
- Fritz M., *Göteborgs historia: näringsliv och samhällsutveckling 2. Från handelsstad till industristad 1820-1920*, (Stockholm, 1996).
- Fritzell Y., 'Yrkesutövare år 1870', *Statistisk Tidskrift*, 6 (1970) pp. 488-91.
- Fritzell Y., 'Yrkesfördelningen 1825-1835 enligt Tabellverket och andra källor', *Statistisk Tidskrift*, 3 (1976), pp. 181-229.
- Fritzell Y., 'Yrkesfördelningen 1805-1820 enligt Tabellverket och andra källor jämte sammandrag intill 1855', *Statistisk Tidskrift*, 1 (1980), pp. 5-69.
- Gadd C.-J., *Järn och potatis: jordbruk, teknik och social omvandling i Skaraborgs län 1750-1860* (Göteborg, 1983).
- Gadd C.-J., *Självhushåll eller arbetsdelning?: svenskt lant- och stadshantverk ca 1400-1860* (Göteborg, 1991).
- Gadd C.-J., *Den agrara revolutionen 1700-1870* (Borås, 2000).
- Glennie P. & Whyte I., eds. *Towns in an agrarian economy 1540-1700* (Cambridge, 2000).
- Gårdlund T., *Industrialismens samhälle* (Stockholm, 1942).
- Hammar Å.C.W.M. & Forsell C.A., *Socken-statistik öfver Sverige, efter C. af Forsells socken-statistik* (Stockholm, 1860).
- Hann A., 'Industrialisation and the service economy', in J. Stobart, & N. Raven, eds., *Towns, regions and industries: urban and industrial change in the Midlands, c.1700-1840* (Manchester, 2005), pp. 42-61.
- Hartwell R.M., 'The Service Revolution: The Growth of Services in Modern Economy 1700-1914', in C. M. Cipolla, ed. *The Fontana economic history of Europe* (London, 1973), pp. 358-96.
- Heckscher E.F., *Till belysning af järnvägarnas betydelse för Sveriges ekonomiska utveckling* (Stockholm, 1907).
- Heckscher E.F., *Sveriges ekonomiska historia från Gustav Vasa* (Stockholm, 1949).

- Hollen Lees L., 'Urban networks', in M. Daunton, ed. *The Cambridge urban history of Britain. Volume III 1840-1950* (Cambridge, 2000), pp. 59-94.
- Houston R. & Snell K.D.M., 'Proto-industrialization? Cottage Industry, Social Change, and Industrial Revolution', *The Historical Journal*, 27 (1984), pp. 473-92.
- Hudson P., *The genesis of industrial capital: a study of the West Riding wool textile industry c.1750-1850* (Cambridge, 1986).
- Hudson P., *The industrial revolution* (London, 1992).
- Hultqvist P., *Försvar och skatter: studier i svensk riksdagspolitik från representationsreformen till kompromissen 1873* (Göteborg, 1955).
- Jonsson P., *Marknadens väv: svenska mekaniserade bomullsväverier i distribution och försäljning 1850-75* (Uppsala, 2000).
- Järnvägsstyrelsen, *Sveriges järnvägar hundra år: SJ 1856-1956* (Stockholm, 1956).
- Karlsson F., *Mark och människor: befolkning och försörjningsresurser i västra Småland 1800-1850* (Göteborg, 1976).
- Karlsson F., *Mark och försörjning: befolkning och markutnyttjande i västra Småland 1800-1850* (Göteborg, 1978).
- Kindleberger C.P., *A financial history of Western Europe* (New York, 1993).
- Kommittébetänkande, *Underdånigt betänkande af den för undersökningar angående stambanornas lämpligaste sträckning i nåder tillförordnade komité* (Stockholm, 1859).
- Kriedte P., Medick H. & Schlumbohm J., *Industrialization before industrialization: rural industry in the genesis of capitalism* (Cambridge, 1981).
- Langton J., *Geographical change and industrial revolution: coalmining in South West Lancashire, 1590-1799* (Cambridge, 1979).
- Langton J., 'Urban growth and economic change c. 1688-1841', in P. Clark, ed. *The Cambridge urban history of Britain 1540-1840* (Cambridge, 2000), pp. 453-90.
- Lemire B., *Fashion's favourite: the cotton trade and the consumer in Britain, 1660-1800* (Oxford, 1991).
- Lemon J.T., *The best poor man's country: a geographical study of early Southeastern Pennsylvania* (Baltimore, 1972).
- Lilja K., *Marknad och hushåll: sparande och krediter i Falun 1820-1910 utifrån ett livscykelperspektiv* (Uppsala, 2004).

- Lindberg O., 'An economic-geographical study of the localization of the Swedish paper industry', *Geografiska Annaler*, 35 (1953), pp. 28-40.
- Lundh C., *Den regionala befolkningsstatistiken i Tabellverket: en databeskrivning* (Lund, 2003).
- Lösch A. & Woglom W.H., *The economics of location* (New Haven, 1954).
- Maddison A., *Phases of capitalist development* (Oxford, 1982).
- Magnusson L., *An economic history of Sweden* (London; New York, 2000).
- Malmberg A., *Industrisysselsättningens regionala utveckling 1870-1980* (Uppsala, 1987).
- Marks E.B., 'Rural response to urban penetration: Baltimore and St. Mary's County, Maryland, 1770-1840', *Journal of Historical Geography*, 8 (1982), pp. 113-27.
- Martinius S., *Befolkningsrörlighet under industrialismens inledningsskede i Sverige* (Göteborg, , 1967).
- Martinius S., *Agrar kapitalbildning och finansiering 1833-1892* (Göteborg, 1970).
- McCullagh P. & Nelder J.A., *Generalized linear models* (London, 1989).
- Mitchell I., 'The development of urban retailing 1700-1815', in P. Clark, ed. *The transformation of English provincial towns 1600-1800* (London, 1984), pp. 259-83.
- Montelius S., *Västerås genom tiderna* (Västerås, 1993).
- Mui H.-C. & Mui L.H., *Shops and shopkeeping in eighteenth-century England* (London/Kingston, Ont., 1989).
- Müller L., *The merchant houses of Stockholm, c. 1640-1800: a comparative study of early-modern entrepreneurial behaviour* (Uppsala, 1998).
- Nilsson L., *Den urbana transitionen: tätorterna i svensk samhällsomvandling 1800-1980* (Stockholm, 1989).
- Nilsson L., *Historisk tätortsstatistik* (Stockholm, 1992).
- Nordmark D., ed. *Liberalernas segertåg (1830-1858)* (Stockholm, 2001).
- North D.C., 'Location theory and regional economic growth', *The Journal of politic Economy*, 63 (1955), pp. 243-58.
- Nygren I., *Tendenser i större svenska sparbankers kreditgivning 1821-1914* (Stockholm, , 1967).
- O'Brien P., *Railways and the economic development of Western Europe 1830-1914* (London, 1983).

- Ogilvie S., *State corporatism and proto-industry: the Württemberg Black Forest, 1580-1797* (Cambridge, 1997).
- Olsson U., *Generalized linear models: an applied approach* (Lund, 2002).
- Oredsson S., *Järnvägarna och det allmänna: svensk järnvägspolitik fram till 1890* (Lund, 1969).
- Persson C., *Regionala och lokala variationer i hemmansklyvning i Sverige under 1700- och 1800-talen* (Stockholm, 1996).
- Peterson G., *Jordbrukets omvandling i västra Östergötland 1810-1890* (Stockholm, 1989).
- Petersson I., 'Öfversikt öfver Sveriges inre vattenvägar', in *Om inre vattenvägar. Samlade uppsatser ur Teknisk tidskrift 1915-1916* (Stockholm, 1916), pp. 30-6.
- Petersson T., *Framväxten av ett lokalt banksystem: Oppunda sparbank, Södermanlands enskilda bank och stationssamhället Katrineholm 1850-1916* (Uppsala, 2001).
- Pettersson R., *Laga skifte i Hallands län 1827-1876: förändring mellan regeltvång och handlingsfrihet* (Stockholm, 1983).
- Phillips C.B., 'Town and country: economic change in Kendal c. 1550-1700', in P. Clark, ed. *The transformation of English provincial towns 1600-1800* (London, 1984), pp. 99-132.
- Pollard S., *Peaceful conquest: the industrialization of Europe, 1760-1970* (Oxford, 1981).
- Pred A.R., *Urban growth and the circulation of information: the United States system of cities, 1790-1840* (Cambridge, Mass., 1973).
- Reed M., 'London and its hinterland 1600-1800: the view from the provinces', in P. Clark, & B. Lepetit, eds., *Capital cities and their hinterlands in early modern Europe* (Aldershot, 1996), pp. 51-83.
- Reeder D. & Rodger R., 'Industrialisation and the city economy', in M. Daunton, ed. *The Cambridge urban history of Britain 1840-1950* (Cambridge, 2000), pp. 553-92.
- Riemer S.T., Boris; Gårdlund, Torsten; Palander, Tord; Klintholm, Rune; Isbell, Eleanor C., *Population movements and industrialization: Swedish counties, 1895-1930* (London/Stockholm, 1941).
- Royle S.A., 'The development of small towns in Britain', in M. Daunton, ed. *The Cambridge urban history of Britain. Volume III 1840-1950* (Cambridge, 2000), pp. 151-84.
- Sandgren F., *Stationssamhället och varudistributionen*, (Malmö, 1999).

- Sandgren F., *Åt var och en efter behov?: en studie av lanthandeln i Revsundsregionen i Östra Jämtland 1870-1890* (Uppsala, 1999).
- SCB, *Statistisk årsbok för Sverige* (Stockholm, 1917).
- SCB, *Minnesskrift med anledning av den svenska befolkningsstatistikens 200-åriga bestånd* (Stockholm, 1949).
- SCB, *Historisk statistik för Sverige. Yrkesfördelning 1751-1800 enligt Tabellverket och andra källor* (Örebro/Stockholm, 1992).
- Schön L., *En modern svensk ekonomisk historia: tillväxt och omvandling under två sekel* (Stockholm, 2000).
- Shaw G., ed. *The European scene: Britain and Germany* (Leicester, 1992).
- Shaw G. & Benson J., *The evolution of retail systems, c. 1800-1914* (Leicester, 1992).
- Stobart J., 'Geography and industrialization: the space economy of Northwest England, 1701-1760', *Transactions of the Institute of British Geographers*, 21 (1996), pp. 681-96.
- Svensson J., *Jordbruk och depression 1870-1900: en kritik av statistikens utvecklingsbild* (Lund, 1965).
- Szostak R., *The role of transportation in the industrial revolution: a comparison of England and France* (Montreal, 1991).
- Söderberg J., Jonsson U. & Persson C., *Stagnating metropolis: economy and demography in Stockholm, 1750-1850* (Cambridge, 1991).
- Thirsk J., *Economic policy and projects: the development of a consumer society in early modern England* (Oxford, 1978).
- Thirsk J., 'Industries in the countryside', in R. A. Church, & E. A. Wrigley, eds., *The industrial revolutions* (Oxford, 1994), pp. 388-406.
- Wadsworth A.P. & De Lacy Mann J., *The cotton trade and industrial Lancashire 1600-1780* (Manchester, 1931).
- Wallerstedt E., *Finansiärers fusioner: de svenska affärsbankernas rötter 1830-1993* (Uppsala/Stockholm, 1995).
- Weatherill L., *Consumer behaviour and material culture in Britain, 1660-1760* (London, 1988).

Westlund H., *Kommunikationer, tillgänglighet, omvandling: en studie av samspelet mellan kommunikationsnät och näringsstruktur i Sveriges mellanstora städer 1850-1970* (Umeå, 1992).

Ville S.P., *Transport and the development of the European economy, 1750-1918* (New York, 1990).

Vries J.D., *European urbanization, 1500-1800* (London, 1984).

Table 1. Average amount of arable land, social structure and taxation of arable land in rural parishes in the Southeast and Mälardalen 1820, 1850 and 1890.

	Southeast			Mälardalen			Sweden
	Arable/acre (%)	Landless/peasants	Value/tax unit (Rd Banco)	Arable/acre (%)	Landless/peasants	Value/tax unit (Rd Banco)	Value/tax unit (Rd Banco)
1820	4	2	5.16	7	3	5.20	5.03
1850	9	3	6.05	17	4	6.04	4.33
1890	16	1	23.33	27	2	20.40	-

Sources: Arable land: Kommittébetänkande (1859); Emigrationsutredningen & Sundbärg (1910). Landless and yeomen: DDB, the Table Commission 1820 and 1850; RA, SCB, '1a avdelningen. Byrån för befolkningsstatistik. 1890 års folkräkning', Hiba: 23-25 & 27. Taxation: Forsell (1834); Hammar & Forsell (1860); RA, Länsräkenskaperna 1890, tax registers (taxeringslängder). See also Appendix 1.

Table 2. Service functions in towns in Mälardalen and in the South Eastern region 1820-1890

	1820		1850		1870		1890					
	Traders (per 10,000 inhab.)	News-papers										
The Southeast	15	0	5	12	14	15	10	39	20	38	53	24
Mälardalen	67	3	14	49	20	24	54	66	40	99	112	95
Stockholm excluded	16	0	6	18	16	10	10	46	17	39	54	37

Sources: Traders: Traders in relation to total population of the region. DDB, Table Commission 1820 and 1850; BiSOS E 1870 and 1890; BiSOS F 1896. Banks: Wallerstedt (1995); Cronblad (1993); *Sveriges Handelskalender* (1869); *Sveriges Bankmatrikel* (1886). Newspapers: UUB, Topographic register of Swedish local newspapers.

Table 3. Industrial employees in urban and rural parishes in Mälardalen and the Southeast, 1820, 1850, 1870 and 1890, in number and per cent

	Mälardalen				The Southeast			
	Urban	Rural	Number of employees	In Stockholm	Urban	Rural	Number of employees	of employees
1820	3.3	2.3	13,000	3,000	0.9	1.5	6,000	
1850	2.3	2.2	13,000	2,000	1.9	1.3	7,000	
1870	3.9	3.4	27,000	6,000	4.1	2.1	16,000	
1890	7.9	5.1	63,000	21,000	7.7	3.3	29,000	

Sources: 1820 and 1850 rural and urban: DDB, Table Commission. Rural 1870 and 1890: SCB, Population census 1870 and 1890. Urban 1870 and 1890: RA, Urban industrial statistics 1870 and 1896.

Note: For urban industry in the 1890s data from 1896 is used. Male and female workers and assistants and servants in industry are included. For the countryside craftsmen have been counted as industrial employees since the difference in character between rural industrial production and rural handicraft production was very small. In 1870 and 1896 data for market towns are missing.

Table 4. Comparison of goodness-of-fit between generalised linear models based on parish and parish and urban variables for explaining rural industrialisation in two Swedish regions in 1820, 1850 and 1890.

	Total industry		Extractive industry		Non-extractive	
	Parish	Parish & urban	Parish	Parish & urban	Parish	Parish & urban
<i>1820</i>						
Degrees of freedom (df)	581	576	561	556	561	556
Deviance	12030.27	11690.75	11835.18	11614.14	5765.59	5360.35
Pearson's chi-square	21752.27	21591.63	78356.36	71292.77	8064.71	7110.47
Scaled pearson's chi-square (p)	1050.52	1063.81	3714.18	3412.98	784.71	737.53
Scaled pearson's chi ² /df	1.81	1.85	6.62	6.14	1.40	1.33
Log likelihood	1451.13	1488.78	273.87	281.88	1629.23	1757.80
<i>1850</i>						
Degrees of freedom (df)	595	590	580	575	580	575
Deviance	12759.91	12554.88	10852.10	9892.77	6765.08	6619.36
						12329.4
Pearson's chi-square	23276.75	23072.15	45904.14	34767.32	13552.80	7
Scaled pearson's chi-square (p)	1085.40	1084.25	2453.39	2020.79	1161.94	1071.02
Scaled pearson's chi ² /df	1.82	1.84	4.23	3.50	2.00	1.86
Log likelihood	775.00	785.59	402.61	465.72	358.75	397.17
<i>1890</i>						
Degrees of freedom (df)	351	346	351	346	351	346
						15403.2
Deviance	18416.84	18021.21	15860.53	15348.65	15971.58	9
						24147.9
Pearson's chi-square	23988.31	23128.92	30006.60	50851.19	26066.68	6
Scaled Pearson chi ²	457.18	444.07	664.06	695.47	572.86	542.43
Scaled Pearson chi ² /df	1.30	1.28	1.89	2.01	1.63	1.57
Log likelihood	3691.45	3722.54	591.89	608.69	3216.74	3294.29

Note: As the residual error of the models fitted was higher than the one assumed by the Poisson distribution, an overdispersion parameter was calculated. We scaled the standard errors using the square root of the Pearson chi-square dispersion (the SCALE; DEVIANCE-command in SAS/GENMOD). The resulting scaled Pearson chi²-estimate was then divided by the degrees of freedom for each model, and used as an approximate measure of goodness-of-fit for the model. A Pearson chi²/df-value not significantly higher or lower than 1 has been regarded as acceptable goodness-of-fit.

Table 5. Parameter estimates and standard errors (std) for the generalized linear models of rural industrialization with best goodness-of-fit for explaining rural industry in two Swedish regions 1820, 1850 and 1890

	Total industry			Extractive industry			Non-extractive industry		
	1820	1850	1890	1820	1850	1890	1820	1850	1890
Intercept	1.24*** (0.14)	0.77*** (0.17)	2.38*** (0.17)	-	-	2.7*** (0.22)	-0.10 (0.19)	-1.12** (0.36)	1.50*** (0.19)
ORE (yes)	0.91*** (0.11)	1.17*** (0.12)	0.34*** (0.10)	-	-	0.73*** (0.18)	0.44*** (0.11)	0.14 (0.18)	0.13 (0.11)
ARABLE (yes)	-0.05** (0.02)	0.04*** (0.00)	0.02*** (0.00)	-	-	-0.05*** (0.01)	-0.05*** (0.01)	-0.03*** (-0.01)	-0.01** (0.00)
PORT (yes)	0.07 (0.09)	0.07 (0.11)	0.51*** (0.12)	-	-	0.80*** (0.16)	0.09 (0.08)	0.15 (0.12)	0.23*** (0.08)
RAILWAY (yes)	-	-	0.29*** (0.07)	-	-	0.71*** (0.16)	-	-	0.18** (0.07)
AGRLABO UR	0.01 (0.02)	0.07*** (0.02)	0.03 (0.02)	-	-	-0.05 (0.04)	0.02 (0.02)	0.09*** (0.02)	0.04** (0.02)
REGION (Southeast)	-0.25** (0.09)	-0.51** (0.12)	0.46*** (0.09)	-	-	-1.54*** (0.20)	0.20*** (0.09)	0.25 (0.17)	-0.22** (0.09)
DISTANCE			+0.00 (0.01)	-	-		-0.01*** (0.00)	-0.01** (0.00)	-0.01** (0.00)
URBPOP			+0.00 (0.00)	-	-		+0.00 (0.00)	+0.00 (0.00)	+0.00 (0.00)
URBIND			0.01 (0.01)	-	-		-0.02 (0.04)	0.06* (0.03)	0.02 (0.01)
URBTRADE			0.03 (0.02)	-	-		0.18*** (0.04)	0.13 (0.10)	0.04* (0.02)
NEWS (yes)			0.05 (0.08)	-	-		-0.24** (0.08)	0.01 (0.15)	-0.04 (0.10)
Scale	4.55	4.63	7.22	-	-	6.72	3.11	3.39	6.67
N	587	601	358				567	586	358
Degrees of freedom (df)	581	595	346			351	556	575	346
Deviance	12030.2	12759.9	18021.2			15860.53	5360.35	6619.36	15403.2
Scaled Pearson chi ² /df	7	1	1			1.89	1.33	1.86	1.57
Log likelihood	1451.13	775.00	3722.54			591.89	1757.80	397.17	3294.29

Level of significance: ***>99.9%, **>99%, and *>95%.

Table A. Number of parishes in data base and rate of missing cases in relation to all existing parishes in the Mälardalen region and the Southeast, 1820 and 1850

	1820		1850	
	Number of parishes in data	Rate of missing cases (%)	Number of parishes in data	Rate of missing cases (%)
Mälardalen	395	8	398	8
The Southeast	315	7	320	9
Total	710	8	718	9

Sources: DDB, Table Commission; ULA and SSA, Parish archives, Statistical Tables.

Table B. Urban population in Mälardalen and the Southeast 1820, 1850 and 1895

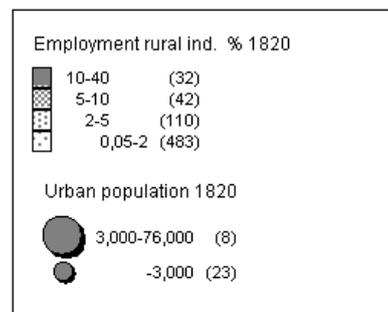
Mälardalen				The Southeast			
Region	Year			Region	Year		
	1820	1850	1895		1820	1850	1895
Stockholm	75,569	93,070	271,638	Karlskrona	11,573	14,097	22,496
Uppsala	4,463	6,952	21,428	Kalmar	4,762	6,634	12,288
Örebro	3,448	5,177	16,764	Jönköping	3,591	6,008	2,1015
Västerås	3,093	3,780	8,942	Karlshamn	3,508	5,071	7,013
Nyköping	2,731	3,806	6,488	Västervik	2,743	4,346	6,773
Sala	2,570	3,252	5,906	Växjö	1,522	2,665	7,086
Eskilstuna	2,010	3,961	12,064	Eksjö	1,222	1,866	3,442
Arboga	1,582	2,233	4,980	Vimmerby	1,154	1,436	2,112
Köping	1,199	1,501	4,313	Sölvesborg	912	1464	1,704
Enköping	1,189	1,413	3,598	Gränna	552	902	1,099
Strängnäs	1,131	1,244	1,969	Oskarshamn	-	-	5,728
Vaxholm	958	911	1,552	Ronneby	-	-	1,942
Södertälje	944	1,245	5,510	Borgholm	-	-	845
Norrtälje	863	1,012	2,434				
Askersund	757	1,047	1,653				
Mariefred	656	610	1,103				
Nora	628	908	1,503				
Lindesberg	624	876	1,680				
Torshälla	556	630	1,559				
Östhammar	498	618	755				
Trosa	488	471	643				
Sigtuna	396	426	536				
Öregrund	0	667	938				

Source: Nilsson (1992)

Map 1. The percentage of rural industrial labour compared to total parish population and total town population in Mälardalen and the Southeast 1820

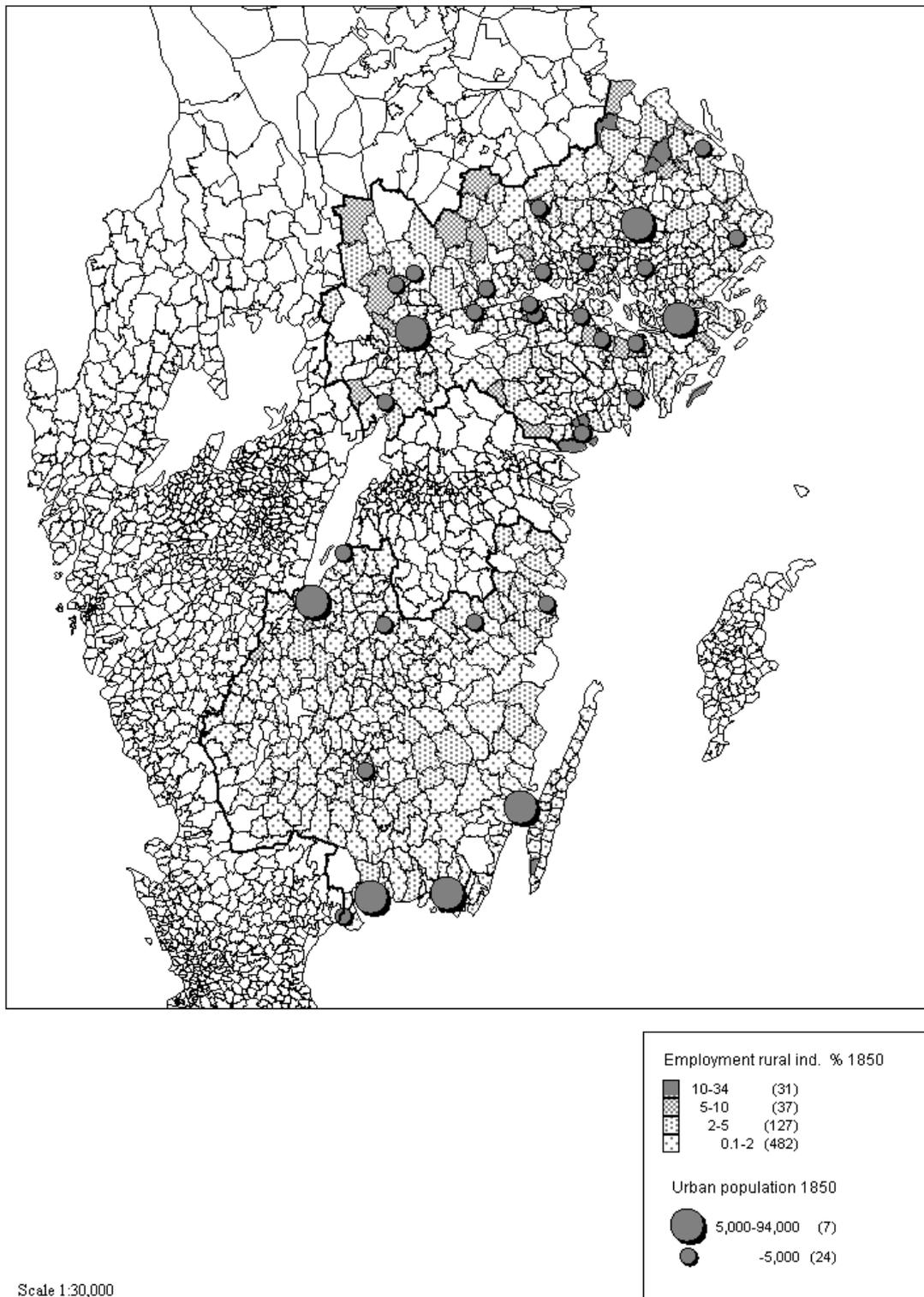


Scale 1:30,000



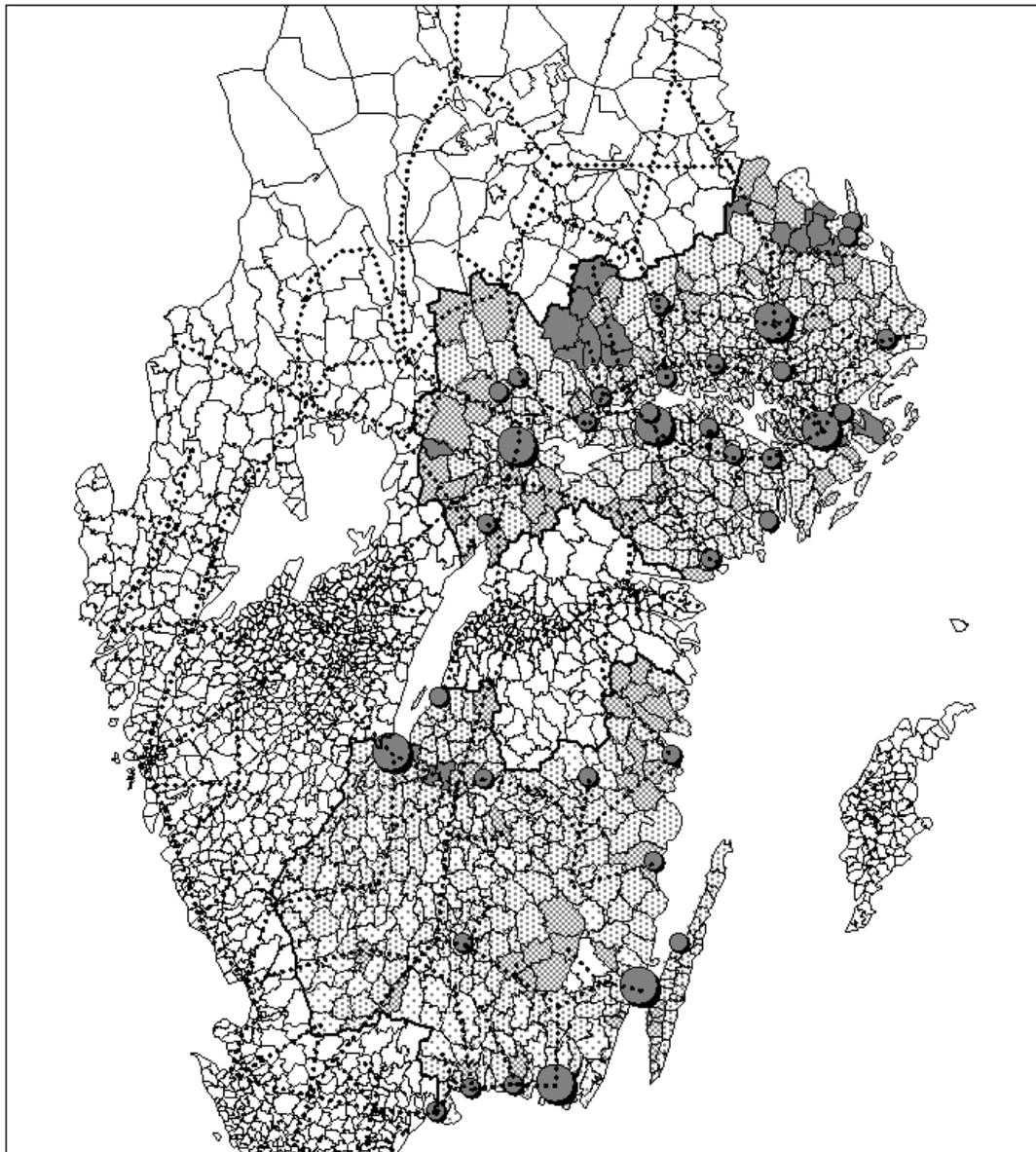
Source: See Appendix 1.

Map 2. The percentage of rural industrial labour compared to total parish population and total town population in Mälardalen and the Southeast 1850



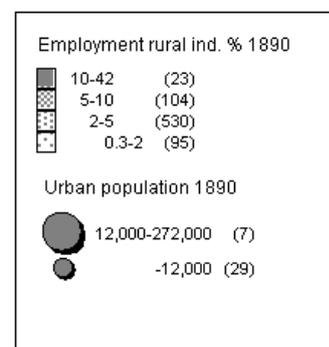
Source: See Appendix 1.

Map 3. The percentage of rural industrial labour compared to total parish population and total town population in Mälardalen and the Southeast 1890



..... = Railway

Scale 1:30,000



Source: See Appendix 1.