

The Swedish economy 1571-1850 – growth or stagnation? Constructing Historical National Accounts

Lennart Schön
Department of Economic History
Lund University

Olle Krantz
Department of Economic History
Umeå University

Very preliminary – please do not quote!

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Introduction

This paper has two main objectives. Firstly, it is intended to be a starting point for the construction of GDP series prior to 1800. For this end, there are two benchmarks available, namely for 1571 and for 1800. A few indicators of trends between these benchmarks are discussed. Secondly, economic growth in the first half of the nineteenth century is analysed based upon the full Swedish Historical National Accounts starting in 1800.

Very generally, the long term pattern is as follows. The benchmarks indicate roughly a stagnant level of GDP per capita with some fluctuations between the late sixteenth and the early nineteenth centuries. However, population growth was vigorous and important structural and institutional changes did occur during the seventeenth and eighteenth centuries, which created a basis for the comparatively strong economic growth that took off from the 1820s.

On one hand, there is a full set of Swedish Historical National Accounts back to 1800 with detailed accounts of each sector presented in eight volumes during the 1980s and 1990s and with GDP series based upon, inter alia, double deflation recently published by Krantz/Schön (2007).¹ These series are to be further elaborated in a research project just started on regional gross products back to the early nineteenth century.² On the other hand, material on the whole economy is scarce before 1800. For the dominant agricultural sector, a number of price series and wage series are available back to the sixteenth century and there are harvest estimates from the seventeenth century onwards. There are, however, no data on the whole economy creating a basis for estimates of the entire Gross Domestic Product with one exception, though – the benchmark of 1571 presented in Krantz (2004). The estimate by Krantz provides the natural starting point for a discussion of long term trends in the Swedish economy.³

The benchmark of 1571

Historical circumstances produced a very specific account of the Swedish economy in the year 1571. In the previous Nordic War, the Danes had conquered the only Swedish possession on the west coast, the Älvsborg castle, at the harbour entrance of Gothenburg connecting the Swedish realm with the North Sea without passage over Danish waters. The Danes demanded a very considerable ransom in order to hand over the castle to the Swedes again. To meet these demands a special tax was raised and recorded based upon possessions of cattle and metals in the country. In connection with records of the regular tithes, these sources were

¹ Krantz, Olle and Schön, Lennart (2007, *Swedish Historical National Accounts 1800-2000*, Lund Studies in Economic History 41, Almqvist & Wiksell International 2007. See also <http://www.ehl.lu.se/database/LU-MADD/National%20Accounts/default.htm>. The sectoral volumes are 1) Schön, Lennart, Jordbruk med binäringar 1800-1980 (Agriculture and Ancillaries), Lund 1995; 2) Schön, Lennart Industri och hantverk 1800-1980 (Manufacturing Industry and Handicrafts 1800-1980) Lund 1988; 3) Pettersson, Lars, Byggnads- och anläggningsverksamhet 1800-1980 (Building and construction 1800-1980), Lund 1987; 4) Krantz, Olle, Transporter och kommunikationer 1800-1980 (Transports and Communications 1800-1980), Lund 1986; 5) Krantz, Olle, Privata tjänster 1800-1980 (Private Services 1800-1980) Lund 1991; 6) Krantz, Olle, Husligt arbete 1800-1980 (Domestic Work 1800-1980), Lund 1987; 7) Krantz, Olle, Offentlig verksamhet 1800-1980 (Public Services 1800-1980), Lund 1987; 8) Schön, Lennart, Utrikeshandel 1800-1870 (Foreign Trade 1800-1870), Mimeo 1984; 9) Ljungberg, Jonas, Deflaterer för industriproduktionen 1888-1955, (Deflators for Industrial Production 1888-1955) Lund 1988.

² The project is on Regional Historical National Accounts for Sweden 1800-2005, funded by Science Council of Sweden.

³ This paper forms part of a research project on Swedish historical accounts prior to 1800 in which Rodney Ecvinsson, Olle Krantz, and Lennart Schön participate.

already in the nineteenth century systematised into an extensive administrative description of Sweden at that time. In Krantz (2004) the material has been further developed into a full estimate of the Swedish GDP of 1571, arranged according to the same structure as the historical national accounts from 1800 onwards. With this procedure, Krantz was able to relate the benchmark of 1571 to the series from 1800 and thus to express a view on long term trends over these centuries. Basically, he found that GDP per capita was at about the same level in 1571 as in 1800, indicating long term stagnation at the per capita level in Sweden prior to the nineteenth century, which was counter to the Maddison (2001) view of a general European growth since the sixteenth century.

There are of course a number of problems and uncertainties with the estimates and the long term analysis that Krantz confronts in his discussion.

First of all, the GDP estimate of 1571 pertains to the realm of Sweden at the time, exclusive of Finland but also exclusive of the provinces in the southern, western and northern part of the Scandinavian peninsula that Sweden conquered from Denmark in the seventeenth century, provinces that were part of Sweden in 1800. To make GDP figures of 1571 and 1800 comparable, the 1571 numbers are increased some 40 percent according to population estimates of the provinces. Thus, the structure of the Danish and Swedish provinces were assumed to be similar, a weakness that Krantz emphasized was due to the lack of regional specific data. One can add here, that the recently launched research on regional GDP back to 1800 may enable correction or corroboration of that assumption through calibration of the GDP levels for the same set of provinces in 1571 and 1800.

Secondly, there are rather wide margins in estimates of the Swedish and Danish population in the late sixteenth century. Actually, the minute and well known Swedish demographic statistics were inaugurated only in the 1730s. Detailed estimates run back to the late seventeenth century while differences in opinions about the population size in late sixteenth century are considerable. Since the basic estimate of GDP is in total numbers, not per capita, the population figures matter very much. Clearly, a higher population estimate of 1571 would lead to a lower population growth but to a positive income growth up to 1800 and vice versa with a lower population estimate of 1571. Suffice it to say here, though, that Krantz final estimate of the population in the Swedish and Danish provinces seems to be well balanced according to recent research. Apart from long term stagnant per capita income, it gives a rather high population growth rate over the seventeenth century of 0.6 percent annually – roughly of the same magnitude as in most of the eighteenth century.

Thirdly, for comparison with GDP of 1800 all products and services of the late sixteenth century are estimated in prices of 1800. Most products of 1571 are staple goods for which it is not too problematic to use prices some centuries later. The dominating primary goods of 1571 were still pervasive in 1800. The service sector, though, presented a particular problem in the deflation procedure and basically a labour cost index was used for deflating all services into prices of 1800.

Fourthly, estimates of individual years are sensitive to fluctuations in production. In the agrarian society harvest fluctuations evidently had a strong impact upon annual GDP, due to varying weather conditions or to warfare that were notorious. The two benchmarks, 1571 and 1800, were similar in this respect. Both were plagued by wars, high grain prices and harvests below the average. On these grounds, Krantz finds the per capita estimates largely comparable.

Thus, Krantz provides an estimate of GDP for Sweden in 1571, both in total and in per capita terms, that gives a basis for further analysis of levels and structures of the economy in long term perspective.

GDP structures of 1571 and 1800

In table 1, the value added of each sector in 1571 and in 1800 is presented with a deflation of the 1571 numbers into prices of 1800. Thus, sectoral price deflators are presented as well. A couple of characteristics of the structure are remarkable.

(Table 1 about here)

The two accounts for 1571 - in the price structures of 1571 and 1800 - produce largely similar results in the sectoral composition. One may conclude that relative prices show a high degree of stability between the two benchmarks even if the effects of a relative increase in agricultural prices over the centuries are noticeable. Thus, in prices of 1800 the agricultural sector is increased by circa 5 percentage points and the manufacturing sector is reduced by roughly the same amount. However, as Krantz remarks, the benchmark 1571 was in a period of bad harvests, and the price level of grain was rather high that year. But as pointed out above, also the years around 1800 saw high prices of food, so the computation indicates a high degree of long term stability in relative prices. This is despite a large population increase.

The relative price fall of manufacturing industry, transports and services may to some extent indicate technical and organisational change. That was particularly so in iron production with a modernisation of the Swedish export industry and the rise of capitalistically managed iron works during the seventeenth and eighteenth centuries and in textile industry with state supported handicraft factories or manufactories from the late seventeenth century. Both industries were also of vital interest to the Swedish military capacity. The relative prices of these products were roughly halved in relation to the GDP deflator over the long period. Also relative shipping rates were reduced by some 20 percent. The price decrease in services reflects somewhat falling labour costs with a slight fall in real wages which will be further addressed in the discussion on long term trends.

The structure of the economy in 1571 and in 1800 can be compared when all sector volumes are expressed in prices of 1800. However, the main conclusions are the same when the comparison is made in current prices. One sector increases its weight dramatically between the benchmarks, namely private services. Krantz admits that data are particularly scarce for private services and the sector may be underestimated in 1571. But overall some great changes that seem plausible affected this sector. The number of domestic servants – dominating private services around 1800 – is much smaller in 1571 and that low number signifies a less stratified agricultural society and a less diversified household sector. A similar feature of a less sophisticated economy in 1571 in terms of commercialisation and capitalisation is also expressed in a much weaker position for private services in trade, finance and diverse personal services. The same is true also for the closely related services of transport and communication with a much lower level in 1571 than in 1800.

The strong rise of all services and transportation between 1571 and 1800 – their total weight increases from about 15 to 40 percent in 1800 prices – means that the weight of the material

sectors agriculture, industry and constructions diminishes accordingly. It is however noticeable that the relation between the two main sectors, agriculture and industry shows a high degree of stability between 1571 and 1800. Thus, manufacturing industry represents slightly more than a quarter of the agricultural sector at both occasions. The relatively high level of manufacturing in 1571 is remarkable. The composition is different, though. In 1571 manufacturing industry was dominated by food industries such as breweries, dairies and butcheries. Food production contributed nearly 2/3 of the total manufactured product value in 1571. In 1800 the equivalent share was close to 1/3. There is, however, a difference in computation that matters. In 1800, all sectors are computed according to value added, while the manufacturing production data of 1571 is calculated at gross value. The value added share in food industries was rather low – a large part of the gross value pertains to input of grain, milk or cattle from agriculture. With similar computation technique, the share of manufacturing should be reduced by some 5 percentage points and distributed to agriculture. That would indicate a considerable structural change between 1571 and 1800 – the sector shares of agriculture and manufacturing should rather be 65/10 and 42/13 respectively, all in the prices of 1800.

This leads to the following conclusions about structural change between 1571 and 1800:

Structural change was considerable between the late sixteenth century and the turn of the century 1800. The contribution of the agricultural sector fell from close to 2/3 of total GDP in 1571 to slightly more than 40 percent in 1800, in constant prices. The manufacturing sector increased its share somewhat, with indications of technical change in a few branches, although to a limited extent. Above all, private services and transportation rose in prominence. Thus, in a comparative sense the economy in the 1570s was overall more dependent upon resources from the primary sector and upon the further preparation of these resources within households with comparatively little specialisation of labour. In 1800, the economy had become much more sophisticated in terms of labour division and sector specialisation.

Furthermore, population increased strongly. While the peninsula was very sparsely populated around 1570, the number of inhabitants had increased almost four times in 1800 – a population increase much higher than the European average over these centuries. The increase meant a decisively different economy at the end of the period. Social stratification developed with a rapid growth of landless classes during the seventeenth century, particularly during the second half of the century, and the process continued into the nineteenth century.

A constant real GDP per capita would mean that the average productivity per labourer remained constant over these centuries (assuming similar ratios of active labourers to total population). It may seem paradoxical that GDP per capita remained almost constant between 1571 and 1800 taking into account that those sectors that had a relatively high labour productivity in 1800 (such as manufacturing, transportation and private services) were much smaller in 1570. This enigma may be explained by a relative shift in productivity over time. Population increase with recourse to marginal land and with diminishing returns to labour in agriculture would be balanced by constant returns to labour in industry and services – even with some technical change in certain industries and organisational change in services raising productivity. These shifts also meant a greater dependence upon imports of grain into Sweden, accelerating during the eighteenth century financed by exports of manufactured products, especially iron bars.

Population pressure on land with diminishing returns in agriculture and a greater specialisation in industry and services would lead to shifts in income distribution. Pressure upwards in relative grain prices would increase returns to land owners, and the marginal productivity of both physical and human capital in industry and services would increase in relation to returns to unskilled labour. Thus, within the framework of a rather constant GDP per capita – indicated by the benchmarks of 1571 and 1800 – society shifted in shape.

Long term trends – real wages

Real wages is one indicator of income development in the long term. From 1800 onwards wage series and GDP data for Sweden are available. The series are very closely related in the long run although with periodic deviations (figure 1). The long term fit and the periodic deviations stand out clearly for the nineteenth century. Deviation of real wages from economic growth was particularly marked during the first half, with a large increase in wages in the 1820s and a subsequent fall to the mid-1850s, in opposite direction to economic growth. This relation between economic growth and real wages in the nineteenth century will be discussed further in a separate paragraph on the take-off of economic growth in Sweden.

(Figure 1 about here)

Wage and price data forming the basis of real wages is probably the best indicator that is available of economic performance prior to 1800. Clearly though, as demonstrated by nineteenth century development, the relationship between wages and growth is not direct in the short or medium term, while real wages should be a good indicator of trends in long term growth that may connect the two benchmarks of 1571 and 1800.

For Sweden, there are primarily two consistent wage series for analysis in the long term. One of the series is for unskilled workers in Stockholm from the early sixteenth century up to the mid-nineteenth century constructed by Johan Söderberg (see figure 2). The series is excellent in consistency and scope in time but data is of course restricted to one urban region in an overwhelmingly agrarian economy. There may have been specific wage fluctuations of short or medium range in the capital city, with for instance construction booms or slumps, but in the longer run it is reasonable that regional wage development concurs. The other series is Lennart Jörberg's wages for agricultural day-workers from the 1730s up to the early twentieth century. These wage notations are available annually for all provinces in Sweden and thus provide an average that is more representative of the whole economy. In figure 2 these wages series are presented, deflated into real wages with the consumer price index constructed by Rodney Edvinsson and Johan Söderberg. A comparison over the period 1732-1850 demonstrates the two points made above – firstly that trends are very similar, both going downwards from the 1730s to about the turn of the century 1800 and then slightly upwards until mid-nineteenth century, secondly that the urban economy of Stockholm show some particularly strong fluctuations that differ from the average of the rural economy.

(Figure 2 about here)

The combined wage series furthermore show some distinctive long trends that can be described as follows: From the 1540s up to the turn of century 1600 real wages were falling. Such a development with a deterioration of living standards in Sweden in the late sixteenth

century was early on claimed by Eli Heckscher in his works on Swedish economic history. From the low points in the early seventeenth century, the trend turned slowly upwards but with strong fluctuations to the peak in the 1690s. That was in the heydays of the Swedish Baltic Empire. From that point of time the level stagnated with some very deep falls during the wars in the early eighteenth century when most of the Baltic possessions were lost. From the 1730s and 1740s real wages clearly moved downwards quite persistently to the trough in the decade of the Napoleonic wars (when the last and most important part of the empire, Finland, was lost to Russia). From that severe trough there was a shift upward again, but very inconsistently from the 1820s to the 1850s.

The long term fall in real wages from the 1730s and 1740s to the 1840s coincides with a strong shift in the composition of the Swedish population. From the mid-eighteenth century to the mid-nineteenth century the landless classes increased strongly, while the number of landowners stagnated. Obviously, this was a period when agrarian structures and labour markets were transformed.

Furthermore, the real wage series bear witness to the fact that both 1571 and 1800 were troubled years plagued by warfare and high grain prices as emphasized by Krantz. The years around 1800 were really the trough in long term development. A direct comparison indicates that real wages in Stockholm in the years 1800/1803 were only some 75 percent of the real wages in 1571/1574. However, rural wages did not fall to such a low point around 1800. When the rural series is adjusted to the Stockholm series from the 1730s, the result actually indicates that real wage levels were the same in the first years of the 1800s as in the first years of the 1570s. Hence, the wage series give a rough corroboration of Krantz' contention that the benchmark estimate of 1571 provides a per capita GDP similar to the level in 1800.

Now, it may seem paradoxical that the same real wages and constant GDP per capita go together with a shift in income distribution to owners of land and of capital that was proposed above in the analysis of structural change and population increase between 1571 and 1800. That enigma is solved, however, by the change in the composition of the population. To demonstrate that effect, we can assume that the population consists of landless and landowners, that the GDP per capita is constant and that the wage level of the landless correspond to fifty percent of the GDP per capita level at both points of time (consistent with stable real wages). If the share of landless workers in population increases from ten percent to fifty percent, then the average income of the landowners will increase from roughly twice to three times the GDP level. That increase is of course only on average among landowners, one may assume as well a redistribution of income in favour of those landowners that engage more physical and human capital.

Trends in agriculture

Based on grain prices, subjective harvest assessments and on tithes, Edvinsson has recently presented an estimate of Swedish harvests annually 1665-1820 that very much resembles the trends in the real wage series (Edvinsson 2009). From the 1690s per capita harvests fell to a low level in the early eighteenth century until harvests were stabilized at a somewhat higher level from the 1740s. Around 1800 bad harvests coincided with war conditions raising the price of imported grain. In the 1810s harvests rose to a markedly higher level by 1820 – and, one may add, now coinciding with the onset of a long period of peace.

This long term perspective is furthermore underpinned by an estimate of agricultural production in Scania 1700-1860, based on data from farmers' accounts. Olsson/Svensson (2010) characterize development as follows; stagnation on per capita level until the 1780s; a first trend break with the early enclosure movement in the 1780s followed by a strong expansion in the first half of the 19th century; a productivity increase per worker of 0.8 percent annually and a per capita increase of 0.6 percent. Their estimates based upon a large sample of farm records points in the same direction as the Krantz/Schön (2007) estimate of a per capita growth of Swedish agriculture of 0.5 percent annually – with Scania as the new leading agricultural district.

Long-term trends – industry and handicrafts

Output of iron and copper: Some quantitative estimates of export and production of iron and copper exist for the period before 1800. Eli Heckscher, in his pioneering work on Swedish economic history,⁴ gives some figures. These estimates were used and complemented by Karl-Gustav Hildebrand in a big research project that was pursued in the 1950s⁵. The estimates made by Heckscher and Hildebrand and other scholars some decades ago have been used in various books and articles but practically no new estimates have been made later. Thus, an incomplete data set concerning the long-term performance of the Swedish metal industry has existed but data have not been put together and elaborated.

New series for osmund and bar iron production were recently constructed on the basis of the figures mentioned above.⁶ They rest to a large extent on export figures which are more frequent than output data. Thus, the data are taken from the point estimates made by various historians. For intermediate years and periods interpolations were made. Besides, figures exist in the official statistics from 1732⁷ and these have of course been utilized. First an annual export quantity series was estimated for the period 1368-1800.⁸ Then, with the help of point estimates of total output for a few years export shares were arrived at which were interpolated and extrapolated and, thereby, output figures could be computed. The old form of iron, osmund, was exported until the early 17th century and after that only bar iron was exported. For a short period both series existed and were weighted to create one series.

For copper production a series from 1540 onwards was compiled in a great work on Swedish copper mining and manufacturing.⁹ There are, however, some lacunas in the series which were filled by interpolation and extrapolation.

The iron and copper series are shown in figure 3. They were also combined by a rough weighting procedure to form a volume series which may be assumed to represent the output of the Swedish metal industry. The weighting was performed on the basis of price ratios between iron and copper. In the 1580s the copper price, according to Heckscher, was six times higher than the iron price. Of course this ratio varied over the two centuries up to 1800. However in the 1820s, according to Jörberg,¹⁰ the ratio was once again around 6:1 and this ratio was used for the whole period. The resulting series is also shown in figure 3.

⁴ Heckscher, Eli (1935-1949), especially I:2 Ch. IV.

⁵ Hildebrand, Karl-Gustav (1957)

⁶ Olsson, Fredrik (2007, and Krantz, Olle/Olsson, Fredrik (forthcoming).

⁷ Historisk statistik för Sverige, Del 3.

⁸ From 1800 onwards estimates are presented in Schön (1988).

⁹ Lindroth, Sten (1955).

¹⁰ Jörberg (1972).

Figure 3 about here

The manufactories: Another series that could also contribute to an estimate of industrial production before 1800 concerns the so called manufactories. In Sweden in the 17th and 18th centuries these production units were founded with generous state support and they were also strictly regulated. They produced various goods, mostly textiles. The manufactory output in the 18th century was first estimated by Heckscher¹¹ and later they were re-estimated by Krantz.¹² In table 2 the output performance of the manufactories is shown for a number of benchmark years.

Table 2 about here

A short analysis: The series discussed here represent only a fraction of the total industrial output in Sweden. In 1802, a benchmark year in the manufactory estimate and the first for which data exist for the total,¹³ bar iron and copper production comprised 8,4 per cent of the total and manufactory production 4,5 per cent. Still they can be seen as indicators of the total. Iron and copper provided raw material for important parts of the manufacturing industry and was of central importance in exports. Manufactory production, on the other hand, represented industries with production mainly of consumption goods.

The iron production shows a long-term upward trend, very clear in the 17th and less so in the 18th century. Copper production clearly expanded in the 17th century as well but retarded in the following century. This means that when the two industries are weighted to one series there is expansion in the 17th century and thereafter stagnation. The development profile is the same as that for urbanization as shown in the present paper. Furthermore, stagnation is also characterizing the manufactory output after an initial spurt in the 1750s. Thus it may be concluded that there were clear differences between the two centuries, which has not always been noticed in the history writing about Sweden.

Long-term trends – domestic trade

In the period 1622-1810 domestic custom duties ("lilla tullen") had to be paid in the Swedish realm. For all goods that were brought to market places or to towns to be sold, the sellers had to pay these duties (1/32 of the merchandise value). The control of the trade was very strict and records were kept on all customs revenues. Some of these records have been lost but the ones left have been used to study the development of domestic trade. The studies are mostly local, and no systematic exploration of the data has been made until a few years ago. Then, the material was critically explored and data series for the whole country were presented by Andersson Palm.¹⁴

The weaknesses of the records were carefully penetrated. One problem is that they comprise data from the entire country which means that Finland is included. However, it seems that the Finnish share of the total was roughly the same during the whole period, around ten per cent. There are also a lot of other problems which were considered by Andersson Palm but he

¹¹ Heckscher (1935-1949), , part II:2, ch 9.

¹² Krantz (1976)..

¹³ Schön (1988).

¹⁴ Andersson Palm, Lennart (2008)..

concluded that the data can be used and that the series in constant prices is a rough indicator of the volume of domestic trade.

Deflation of domestic trade is a general problem when constructing historical national accounts and it has been tackled in various ways. One is to use employment figures in volume calculations which means that constant labour productivity or a certain productivity change is assumed. In this case this is impossible since employment figures are missing. Sometimes a consumer price index has been utilized as a kind of deflator.

Andersson Palm made a calculation of the volume. He chose to eliminate the changes in tariffs over time and apply one tariff, that of 1655, in the whole period. Thus, tariff changes were used as a deflator.

Andersson Palm's data have some lacunas and, therefore, in the present work interpolations were made. In figure 4 two series of the domestic trade in constant prices are presented. One is the series deflated by tariff changes and the other is a series deflated with a consumer price index.¹⁵ Furthermore, in figure 5 the same series per capita are displayed. The former diagram shows a certain upward tendency while the latter shows no growth at all over the period. In the 17th century the per capita series show approximately the same long-run tendency but in the 18th century they differ. The series with tariff deflation shows no long-term change while there is a certain decrease in the one deflated with the consumer price index.

Figures 5 and 6 about here

Since the work on Swedish historical national accounts prior to 1800 is still in a nascent state it has not been decided what series should be used. However, this indicator on domestic trade gives support to the picture of a stagnant GDP over the whole period from the 16th to the 18th centuries. The profiles of the series do not, however, contradict what was said above of expansion in the 17th century since the economic expansion then was to a large extent concentrated to export industries and to production of goods and services for the military force. Furthermore, they are in agreement with the picture of stagnation in the 18th century,

Long term trends – urbanisation

Urban agglomerations were early on networks that provided overall scarce resources of knowledge and competence in industry and services, also to the rural economy. The degree of urbanisation will therefore give an indication of the economic level of a region or nation, and of trends regarding the sophistication of the economy. To catch possible and positive agglomeration or network effects, a threshold of 10 000 inhabitants for urban areas is very often used in European comparative analysis. Such a threshold is however not very suitable from a Swedish perspective. Sweden was for a long time a very rural country with few and small towns. It has been argued that the great dependence upon wood fuel for heating purposes in a cold climate like the Swedish and the widely distributed fuel with high transportation costs put a severe limit to the size of the Swedish towns (Thorburn 2000). Only a few sites with extremely good transportation facilities and with strong positive agglomeration effects could – before the mid-nineteenth century – climb over that threshold. Instead, the Swedish economic structure adapted to these circumstances with for instance a deliberate dispersion of the energy intensive iron industry. Not until the second half of the

¹⁵ Edvinsson, /Söderberg (2009)..

nineteenth century was this natural barrier to urbanisation broken with the advent of new means of transportation and the importation of coal.

If we apply a common European threshold of 10 000 inhabitants there were hardly any other urban agglomeration in Sweden than Stockholm prior to the 19th century - Stockholm itself reached that level only in the 17th century. Applying such a threshold may, furthermore, give strong threshold effects in the measure of urbanisation – jumping up quite discretely. Still the degree of urbanisation may provide an important indication of economic and administrative development also before the nineteenth century. With a more liberal definition of urban areas - counting the number of inhabitants in the 20 largest towns in Sweden as the urban percentage share of total population at certain points of time back to 1570 - a long term projection of Swedish urbanization is provided in figure 6.

(Figure 6 about here)

Urbanisation provides surprisingly similar trends as real wages in Sweden, even if variation is within narrow margins up to 1850. Thus, there are low points in 1610 and 1810 with a peak in 1690 and rapid growth after 1850.

Clearly, there are two periods of urbanisation in Sweden. The first is in the 17th century that commenced during the reign of Gustavus Adolphus II and in the era of the Swedish Baltic Empire. In this period of eighty years up to the peak in 1690, Stockholm became the capital city in reality, increasing its population four times. This was a period of administrative reforms, of increased sophistication in the public sector and of a deliberate support of towns for fiscal, judicial and commercial purposes. (Magnusson 1996) Thus, urbanisation spread and significant cities such as the commercial hub of Gothenburg on the west coast and the naval base of Karlskrona on the south coast were founded in the mid-century. The administrative modernisation of the realm created the basis for the expansionary military power of Sweden during these decades of widespread turmoil and crisis on the European continent. The military demand stimulated some industrial change with modernisation of iron works and canon foundries, and from the late 17th century the state also gave support to urban textiles manufactories.

Urbanization could be an indicator of increasing productivity, both in agriculture and in urban trades, which is supported by the similar trends in urban real wages and in harvests up to the 1690s. However, urbanization was also a means for the state to increase its control of income flows and its efficiency to extract a surplus from the peasants. In the late 17th century and early 18th century – during the reign of Charles XII – these administrative and fiscal powers were increasingly used for warfare leading to deteriorating conditions in the Swedish economy (and to the loss of Baltic possessions as well).

In the eighteenth century the rural character of the country was somewhat reinforced again. The rather stable degree of urbanisation during the 18th century with only a slight decline up to the mid-19th century thus meant that population growth was balanced between the large rural and small urban parts of Sweden. In that sense, the structure created in the seventeenth century was largely kept. Important structural changes were under way, however. In this period the iron works flourished, situated in the countryside, with growth of export trade and with expanding commercial houses in Stockholm and Gothenburg. In the countryside

population growth meant a rapid increase of landless classes while an agricultural transformation with enclosures started in the last half of the 18th century in the southern provinces and was to gain force over the country from the 1820s onwards.

In the first half of the nineteenth century there was a very slight shift to faster growth of urban areas. It also included agglomeration effects related to the rise of a new industrial environment around woollen mills in the town of Norrköping (Schön 1982), expanding from the 1830s, and from the 1850s urbanisation related to modern economic growth really took off.

Once again, urbanisation fits very well with trends in real wages all through the period. The higher level of urbanisation in 1800 than in 1570 also fits the analysis of structural change – the economy of 1800 was clearly somewhat more sophisticated in terms of labour division and rural/urban specialisation than it was in 1570. Levels were not far apart, though.

Thus, a projection backwards of GDP per capita based on real wages may provide a reasonable estimate of long term GDP. However, two items should preferably be amended. Firstly, the series of Stockholm real wages ought to be complemented by rural wage data prior to 1730. Secondly, the GDP benchmark of 1800 is to be regionalised and that will give an even better evaluation of the fit with the estimate of GDP for the provinces making up Sweden in 1571.

Censuses 1751-1855 – the rural society rules

From 1751 onwards, censuses give the employment structure of the Swedish economy, generally every fifth year. A distribution to the main sectors 1751-1855 is presented in table 3. The structure is quite stable over this century-long period. There are, however, some major tendencies that largely fit with the structural changes that have been indicated between the benchmarks of 1571 and 1800.

Table 3 about here.

: Firstly, private services increased due to the expansion of paid domestic work. Its share of total employment increased from about a quarter to a third over the period. The increase was particularly strong in the 1830s, 1840s and 1850s. In these decades, the numerous "post-war" cohorts born in the 1820s and 1830s entered the labour market, with a great increase of maidens servicing peasant households. In this period, the agricultural transformation with increased commercialization and enclosures swept the countryside. Overall, the share of peasants and crofters diminished at about the same amount which means that the rural, agricultural household kept its dominant position with roughly 85 percent of the employed in 1751 as in 1855 but with an increasingly higher level of specialization of paid labour.

Secondly, the share of public servants was nearly halved, although on a low level. About 2/3 of the employed in public service was military staff. In absolute terms, their number culminated 1820 and thereafter the number decreased somewhat while the percentage share fell markedly to the 1850s.

The share of manufacturing workers was rather stable but followed two different trajectories. In the second half of the 18th century, there was an overall increase by workers in the urban manufactories and in the iron works as well as by craftsmen. In the first decades of the 19th

century, the urban manufactories and the iron works stagnated while the increase of craftsmen continued in rural areas. Urban industries expanded once again from the 1840s and 1850s when modern industrialization began to rejuvenate factory production.

The economy 1800-1850 – pauperization or the onset of modern economic growth

One important issue in the present context remains to be analysed – there is a clear discrepancy in the first half of the nineteenth century between, on one hand, economic growth according to the new historical national accounts and, on the other hand, the development of real wages and urbanisation.

As was noted in relation to figure 1, estimates of GDP per capita based on the new Swedish Historical National Accounts and the development of real wages diverged significantly in the first half of the nineteenth century. This was particularly so in the period from the early 1820s to the late 1840s (table 4).

(table 4 about here)

Population growth accelerated from a rather low level during the early direful decades and became really buoyant in the 1820s (1.1 percent) to slow down somewhat in the 1830s (0.8) but picked up again in the 1850s. GDP growth accelerated even more. In the first decades there was merely a recovery from the low levels at the turn of the century but from the 1820s growth became more stable at the quite considerable per capita level of 0.6 percent annually. From the 1850s, growth became even more substantial surpassing the 1 percent level per capita. Real wages showed a distinctly different pattern. From the historical trough of the early years of the century, the recovery was very decisive with the abundant harvests of the 1820s. Then real wages fell consistently during the 1830s and 1840s to a level roughly comparable with the late sixteenth century.

Demographic development and wage data gave early on rise to an interpretation of Swedish economic and social history of the first half of the nineteenth century characterised by the growth of poverty and of the proletariat. Abundant harvests in the 1820s fermented population growth that led to an explosive growth of landless classes that swelled the labour market in the 1830s and 1840s and dragged down wages. Sweden encountered a severe problem to support its population with frequent famines until the 1860s. According to this view, the solution was export growth and emigration in the second half of the nineteenth century.

The fact that Sweden turned from import surplus to export surplus of grain in the very decades of falling real wages was explained not by increased production per capita but by a pressure downwards on consumption for a large part of the population – and by a substitution of potato for grain among the poor.

However, over the last decades, a new interpretation of Swedish development in the first half of the nineteenth century has emerged that largely fit with the view emerging from the historical national accounts of low but accelerating growth both in population and in GDP per capita.

Thus, research in the 1970s and 1980s on industrial progress in the early nineteenth century put forward a view of a more dynamic domestic market from the 1820s onwards, largely

relying upon the transformation of agriculture. A primary indication of growth was the consumption of industrial goods that expanded vigorously (Schön 1979, 1984). Between 1820 and 1850 the annual growth rate was close to 3 percent on a per capita basis, with industrial consumption goods supplied both from domestic industries and from imports. Textiles made up a large part of this consumption but over the decades the range of goods widened. The growth was fairly even and sustained through the 1830s and 1840s, calling into question the earlier view of stagnation or deteriorating conditions in these decades.

If consumption increases of goods that to a large extent are dispensable – such as textiles, pottery, and soap and so on – one can assume that income increases as well. Three question marks to such an interpretation have to be eliminated, though. Firstly, the increase may be a reaction to a persistent change in relative prices rather than in income. Secondly, recorded growth may contain substitution from domestic production within the households to production within the industrial sector – a structural change that is important but may exaggerate growth. Thirdly, consumption growth may be due to shifts in income distribution to strata of the population that have high income elasticity in their demand for consumption of industrial goods and away from strata with a low elasticity in their demand.

To the first question, the answer is that roughly half of this consumption growth was explained by a falling price of industrial goods relative to grain and also to labour. But the other half corresponded to an increasing quantity of grain or labour spent on industrial consumption – an indication of increasing income for a large part of the population. (Schön 1984) Furthermore, it was also the case that prior to 1820 industrial consumption fluctuated strongly and inversely to grain prices but from the 1820s consumption growth became both stable and little sensitive to fluctuations in grain prices, another indication of increasing income with a widening margin in income over expenditure for subsistence.

Substitution effects was probably particularly strong in textiles, where for instance the importation of cotton at rapidly falling prices induced stagnation and regional decline in the traditional cultivation of flax and in the domestic production of linen. In Schön (1979) total production of textiles 1826-1870 was calculated, including production within households for their own use. Structural change in the consumption of textiles of different quality was immense. Thus, consumption of cotton cloth increased about ten times from the 1820s to 1850, while consumption of woollens and silk roughly doubled and consumption of linens stagnated. The substitution effects of factory cloth for domestic household production was however very limited before 1850. Instead, factory cloth and domestic household production expanded in parallel while growth slowed down in proto-industrial forms of production such as putting-out (see table 5). Actually weaving at home for the household's own use accelerated over the period with the increased supply of coarse yarn from factories at falling prices.

(table 5 about here)

Hence, total growth rates in consumption of textiles were not very strongly affected by the inclusion of the supply of wool and flax from agriculture and the household production of yarn and cloth for its own use.¹⁶ The composition, however, in terms of production types and qualities of cloth were much affected which gives further insights in the process of growth.

¹⁶ Similar results were obtained from an analysis of total production and consumption of iron and iron goods in the period 1800-1870 (Schön 1987a).

There was a shift over time in the composition of textile growth with different characteristics of the 1830s, 1840s and 1850s that indicates shift in income distribution as well. (Schön 1979) In the early phase of expansion, cloth of a luxurious character made up a substantial part of growth supplied primarily from woollen mills and from imports. Proto-industrial putting out was also rather expansive, particularly in the western regions of the country with rapid growth of the rural proletariat. In the 1840s, composition in growth changed. While the production and importation of extraordinary qualities stagnated, the production of good but plain qualities expanded at the factories as did the supply of yarn for household production. In the 1850s, the structural change became even more pronounced. Coarse cloth expanded both at woollens and cotton mills as did the supply of coarse cotton yarn to domestic household weaving. These shifts indicate a social diffusion of consumption growth from more affluent landowners to peasants and to even broader strata of the population. The strong and sustained growth in consumption thus seems to have been stimulated by shifts in income distribution that over the period widened the social basis of expansion.

The shift was clearly shown in real wages. In the 1850s, wages increased strongly after decades of stagnation. At the same time mechanisation of weaving had a massive breakthrough at both cotton and woollen mills – the inclination to save labour in weaving was reinforced both by the widened demand for plain and coarse cloth and by the increased price of labour.

Shifts in income distribution over the decades from the 1820s to the 1850s would explain why total growth expanded from an earlier date than real wages while real wages exaggerate growth in the 1850s. Another question is, though, if the fluctuations in real wages also meant fluctuations in real income for the wage earning classes, more precisely the question is whether or to what extent the fall in real wages and the growth of the proletariat in the 1830s and 1840s coincided with a pauperization of a large part of the population?

Evidently the growth process up to the 1850s was heavily dependent upon the agricultural sector. Other sectors were small and only growing slowly (see table 6). Within the manufacturing industry, for instance, strong growth in certain sectors such as cotton textiles was counteracted by sluggish growth in the traditional iron industry that met new competition internationally. Thus, it was mainly the transformation of agriculture that could provide the dynamics behind consumption growth and overall GDP growth as well as provide major shifts in the demand for labour.

(table 6 about here)

The agricultural revolution and expansion from the late eighteenth century up to the mid-nineteenth century is by now well documented (e.g. Gadd 2000). In the light of this documentation, the agricultural growth rate of some 0.3-0.4 percent above population growth in the first half of the nineteenth century is reasonable resulting in the change from import to export surplus of grain together with stable food consumption per capita. The transformation entailed increased commercialisation of agricultural production, introduction of new crops, more intensive cultivation and rotation, enclosures and reclamation of land. Taken together, these changes meant reduced seasonal variations in labour demand in agriculture. Even if the marginal productivity of labour was reduced during peak seasons, due to the expanded supply of labour, the number of productive working days per annum was increased. Involuntary unemployment or employment with other low productive ends could thus be reduced. Therefore, the agricultural revolution may have produced an industrious revolution – further

induced by a higher preference for income due to the enriched supply of consumption goods. The fall in real day wages may very well have been consistent with on average stable real income for wage earners in the 1830s and 1840s, while real income undoubtedly expanded from the 1850s.

The agricultural expansion had its roots in the growth of the domestic market but it was strongly reinforced from the 1840s and 1850s with the growth of foreign demand that suited Swedish conditions very well. In these decades the exports of oats expanded from Sweden to Britain – to fuel the horses of the British transportation system. Rising price of oats stimulated Swedish agriculture immensely and spread commercialisation both regionally and socially. Oats thrive on rather barren soil and southern parts of Sweden were richly endowed with such resources. Reclamation of land intensified and the income from exports was widely diffused. Furthermore, demand for timber and sawn wood expanded as well, raising the value of even less fertile land, diffusing income also to the north of Sweden and reducing the seasonal variation in the demand for labour even more. These forces of growth came to the fore from the mid-century but the commercialisation of agriculture in the preceding period made reactions to price movements swift.

A note on Swedish data in Maddison tables

If we take the Maddison data¹⁷ of 1820 as one benchmark and assume that Swedish income per capita was stable prior to 1800, Sweden would be among the wealthiest countries in Europe around 1600! In 1990 Int dollars, Swedish per capita GDP would be around 1085, some 10 percent above UK and Belgium and 25 percent above Denmark. Such a Swedish lead (together with the Netherlands and Italy) in Europe does not seem very likely.

However, Swedish level in 1820 is probably too high in Maddison – and Swedish growth rates in the first half of the 19th century much too low in Maddison's per capita series. While the Maddison data gives a per capita growth rate of 0.65 percent 1820-1870, the accounts of Krantz/Schön give a growth rate of 1.08 percent. Following the new accounts of Krantz/Schön, and taking the 1870 level in Maddison as benchmark, the Swedish GDP 1820 in Maddison should be reduced by circa 20 percent. That would make the proposition of a stable level in Sweden between the late 16th century and early 19th more reasonable.

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¹⁷ [Statistics on World Population, GDP and Per Capita GDP, 1-2006 AD](#) (Last update: March 2009, *horizontal file*, copyright Angus Maddison)

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Table 1. Sectoral composition of Swedish GDP in 1570 and 1800 - in current prices and in prices of 1800. Services of dwellings excluded.

	1571 current prices	1571 in prices of 1800	Price change relative to the GDP deflator 1571-1800	1800 current prices
Agriculture with subsid.	55,0	60.3	110	41,8
Manufacturing industry	20,0	15.7	79	13.0
Building & construction	8.3	8.7	105	4.6
Transport & communication	5.5	4.7	85	9.0
Private services	4.3	3.8	88	21.4
Public services	7.5	6.6	88	8.7
Total	100	100	100	100

Sources: Krantz (2004); Krantz/Schön (2007)

Table 2. Volume of textile production 1745-1802, index 1779=100

1745	50
1759	91
1766	78
1779	100
1789	86
1795	92
1802	106

Source: Krantz (1976).

Table 3. Employment distribution between sectors 1751-1855.

	Agriculture	Manufacturing	Private services	Public services
1751	59.0	5.9	29.1	6.0
1775	57.5	6.3	30.9	5.4
1800	56.7	6.7	31.4	5.2
1830	57.3	5.8	32.4	4.5
1855	53.2	6.2	37.1	3.5

Source: Statistiska meddelanden. Ser A Band VI:4; Table 6-10

Note: Private service includes paid domestic workers. This category is specifically accounted for from 1805 – prior to that the number of paid domestic workers is extrapolated from the number of “children and servants” among the peasantry.

Table 4. Annual percentage change of population, real wages and GDP per capita in Sweden 1800-1875.

	Population	GDP	Real wages
1800/04-1820/24	0.52	0.83	1.48
1820/24-1846/50	1.00	1.57	-0.34
1846/50-1871/75	0.93	2.64	1.29

Sources: GDP and population from Krantz/Schön (2007); wages from Jörberg (1972); consumer price index from Edvinsson/Söderberg (2009).

Table 5. Annual percentage growth in the supply of cloth from different types of production 1826-1859. Volumes in constant prices, price base 1838/40.

	Factory production	Household for sale	Household for own use	Imports	Total supply
1826/28-1837/39	4.6	4.2	2.1	9.4	3.7
1837/39-1847/49	4.2	3.3	4.1	3.1	3.9
1847/49-1857/59	3.4	0.8	4.5	7.2	4.1

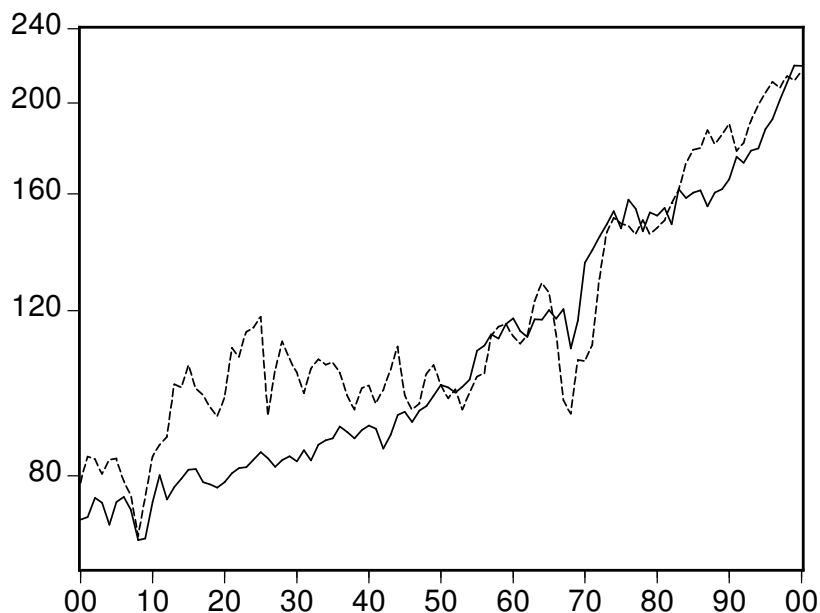
Source: Schön (1979).

Table 6. Annual percentage growth in production sectors in Sweden 1800-1870.

	Agriculture	Manufactur. industry	Building & Construction	Transport & Communication	Private Services	Public Services
1800/04-1820/24	1.35	- 1.16	- 0.80	1.12	0.96	0.99
1820/24-1846/50	1.36	2.34	1.83	0.72	1.92	1.43
1846/50-1866/70	2.08	3.99	1.92	2.95	2.44	0.53

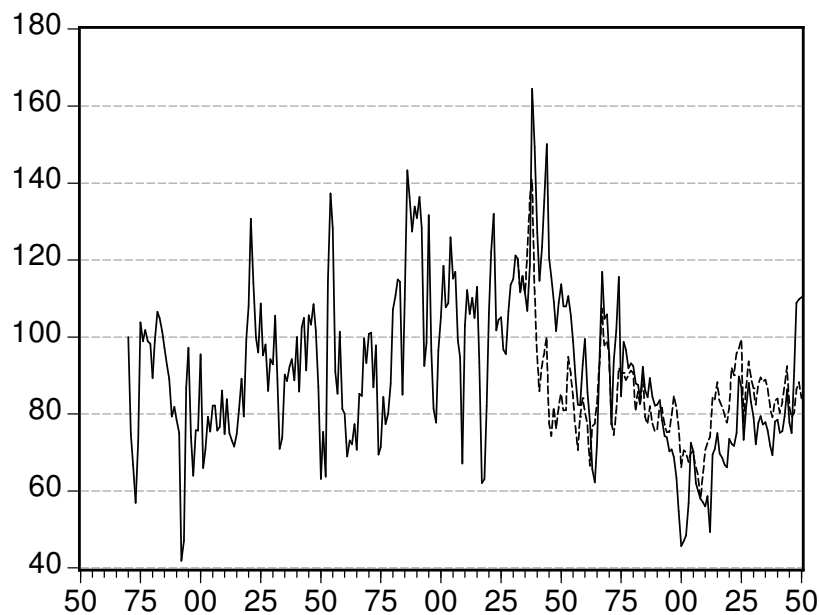
Source: Krantz/Schön (2007)

Figure 1. GDP per capita (full line) and real wages (dotted line) in Sweden 1800-1900. Index 1850=100.



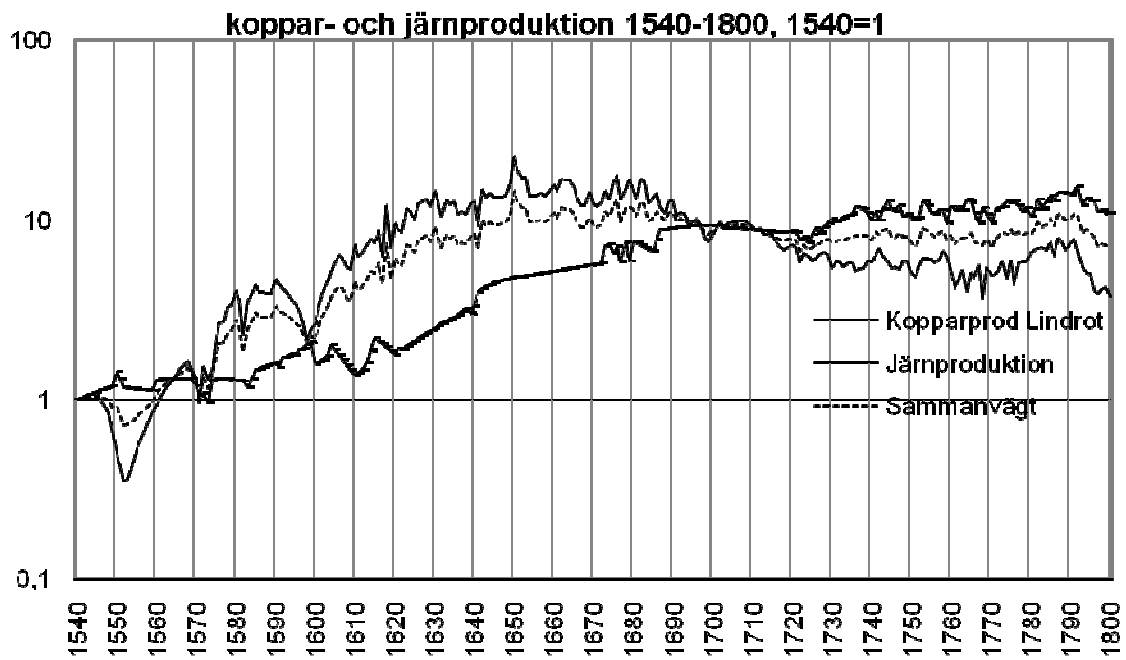
Source: GDP from Krantz/Schön (2007); wages from Jörberg (1972) and Lindal et. al. (1937); consumer price index from Edvinsson/Söderberg (2009).

Figure 2. Real wages of unskilled workers – urban 1570-1850 (full line); rural 1732-1850 (dotted line). Index 1570=100.



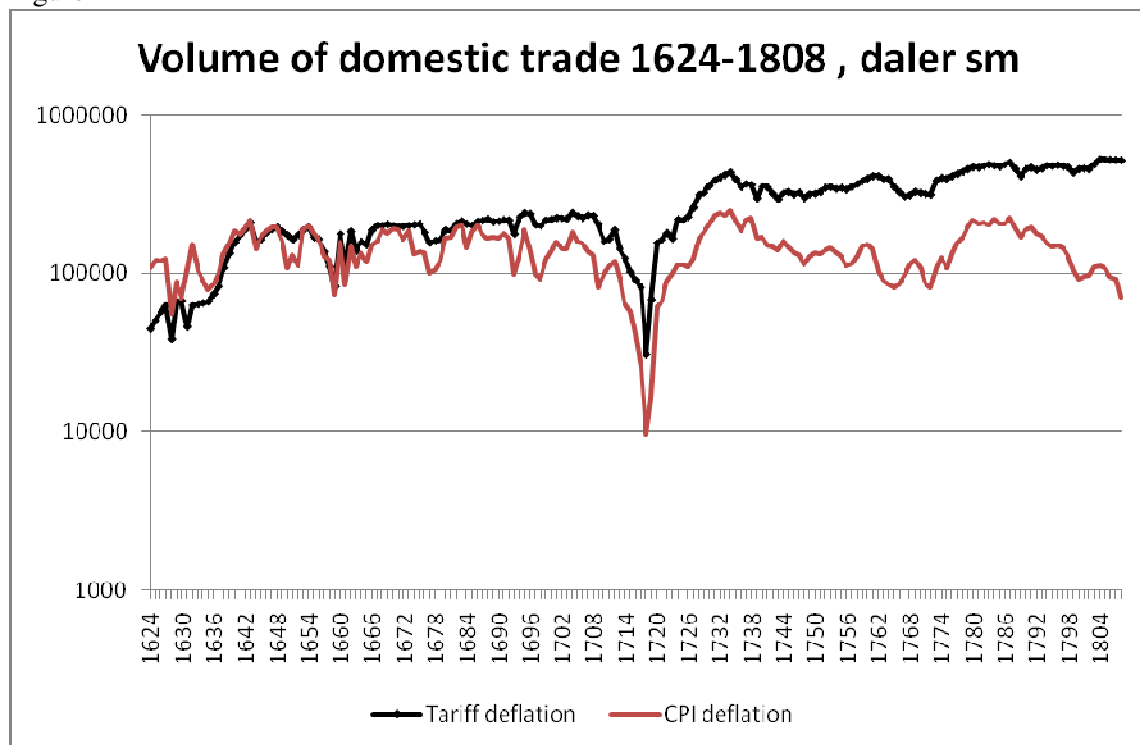
Sources: Wages from Söderberg (2009) and Jörberg (1972) ; consumer price index from Edvinsson/Söderberg (2009).

Figure 3



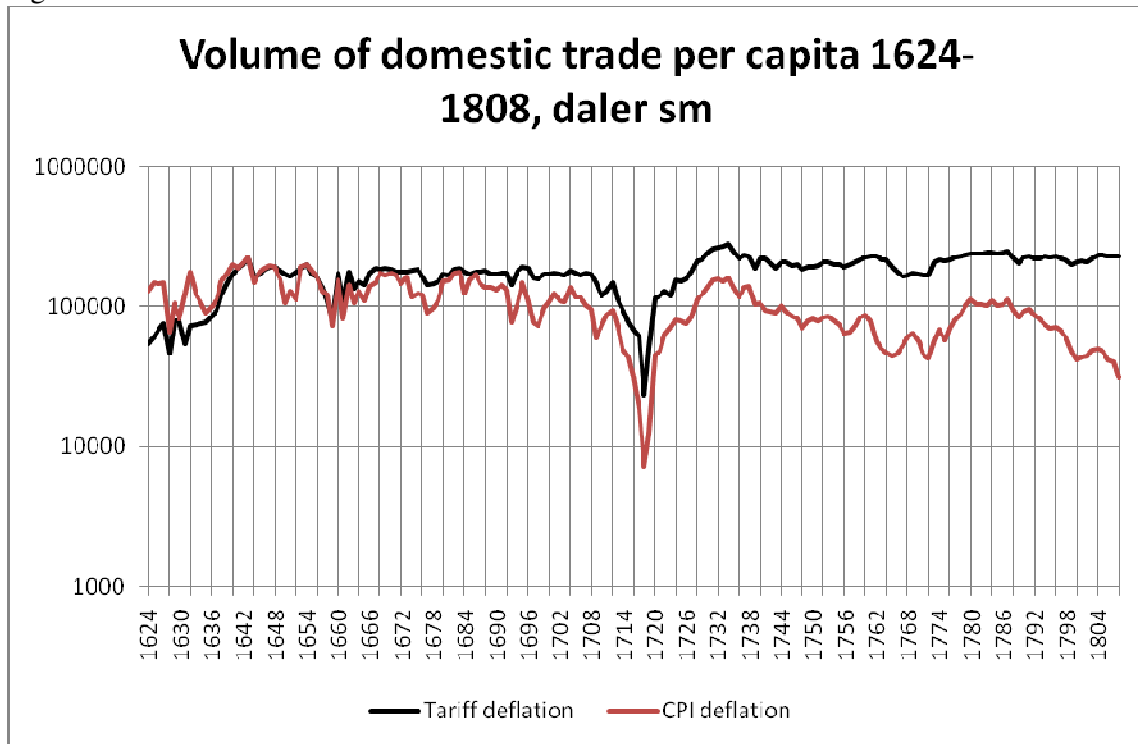
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Figure 4



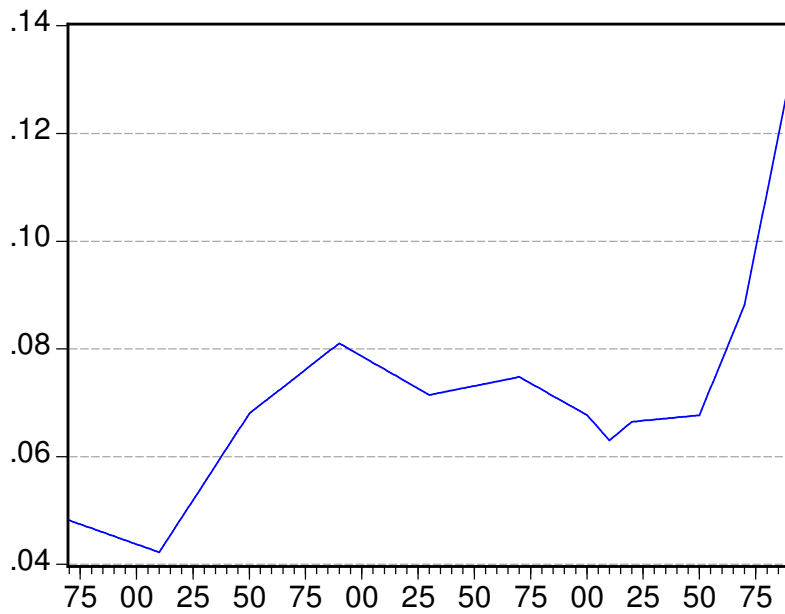
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Figure 5



Source: See text

Figure 6. Degree of urbanisation in Sweden (post-1809 frontiers) 1570-1890. Percentage share of the 20 largest towns in total population



Note: Benchmarks are 1570, 1610, 1650, 1690, 1730, 1770, 1800, 1810, 1820, 1850, 1870 and 1890, connected by interpolation.

Source: Stads- och kommunhistoriska institutet (2009). Historisk statistik för Sverige (1969).