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Sugar in Sweden, 17th to 20th centuries

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From extreme luxury to everyday commodity. Sugar in Sweden, 17th to 20th centuries*

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Abstract: This paper will focus upon the Swedish consumption of sugar, a product that illustrates the shift from being a luxury to being a mass-consumed commodity. Very little attention has been paid to the commodity of sugar by Swedish scholars, at least concerning the period prior to the introduction of the sugar beet in the late 19th century. The paper will try to answer three questions:

- When did sugar experience a shift from luxury to everyday commodity?
- What factors are important to explain the shift?
- What impacts did the increasing sugar consumption have, at home and abroad?

Regarding the last question, the paper most importantly presents a novel calculation of how large the 'ghost acreage' and slave labour population the Swedish consumption during the early modern era required.

JEL: N33, N36, N93

Keywords: Economic History, Price History, Consumption, Sugar, Sweden, Ghost acreage, Slavery

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> "The CONSUMER of West India produce may be considered as the *Master-spring* that gives motion and effect to the whole Machine of cruelties… […] The SLAVE TRADE can receive from no man *greater encouragement,* than by his *Consumption of the* PRODUCE"[1]
>
> *Anonymous pamphlet, "The Duty of Abstaining from the Use of West India Produce, A Speech, Delivered at Coach-Maker's Hall, Jan 12, 1792 (London)."*

1. Introduction

According to Maxine Berg, "Industrialization and commercial modernity in the eighteenth century was, above all, about consumer products. This was a 'product revolution' made by inventors and manufacturers, merchants, retailers and advertisers, and above all by the people who bought 'new luxury'."[2] Other scholars, such as Neil McKendrick, have drawn conclusions in the same direction.[3] Werner Sombart went further, arguing that capitalism essentially was a "child of luxury", since the production of luxury goods demanded a high degree of specialization and international trade, and transferred resources from the nobility to the entrepreneurial bourgeoisie.[4]

The development of a domestic market and the consumption of goods around the time of the 'industrial revolution' have received increasing attention among Swedish economic historians during recent years. Much of this attention has focused on the consumption of clothes and textiles. But according to Carole Shammas the second main category of goods (next to consumer durables) that experienced a significant growth during this period at least in Britain was groceries that for a long time had been considered luxuries, such as tobacco, sugar and caffeine drinks.[5] Britain was not the only country experiencing such a 'product revolution'. Wendy Woloson has for example documented how the consumption of sugar was 'democratized' in the United States, and Colin Jones & Rebecca Spangen have discussed the importance of sugar in revolutionary France during the late 18th century.[6]

This issue has not received very much attention among Swedish scholars even though such consumer goods played an increasingly important role in Sweden as well. The Swedish East-India Company (*Svenska Ostindiska compagniet, SOIC*) – "Sweden's most successful

[1] Quoted in Ragatz 1971, p 260.
[2] Berg 2005, p 6
[3] McKendrick 1982, p 66
[4] Sombart 1967, p 168–171
[5] Shammas 1990, p 292
[6] Woloson 2002; Jones & Spangen 1999

trading company", according to Eli Heckscher[7] – was devoted to importing luxury goods such as tea and spices, apart from porcelain and fine cloths, during the 18th century.[8] Luxury goods poured in from other areas as well – not the least from the Americas, through ports in the European colonial powers.[9]

This paper will focus upon the Swedish consumption of sugar, a product that well might illustrate the shift from being a luxury to being a mass-consumed commodity. Very little attention has been paid to the commodity of sugar among Swedish scholars, at least concerning the period prior to the introduction of the sugar beet in the late 19th century.[10]

The paper will try to answer three questions:

- When did sugar experience this shift from luxury to everyday commodity?
- What factors are important to explain the shift?
- What impacts did the increasing sugar consumption have, at home and abroad?

Regarding the last question, the paper presents a novel calculation of how large the 'ghost acreage' and slave labour population the Swedish consumption required during the early modern era.

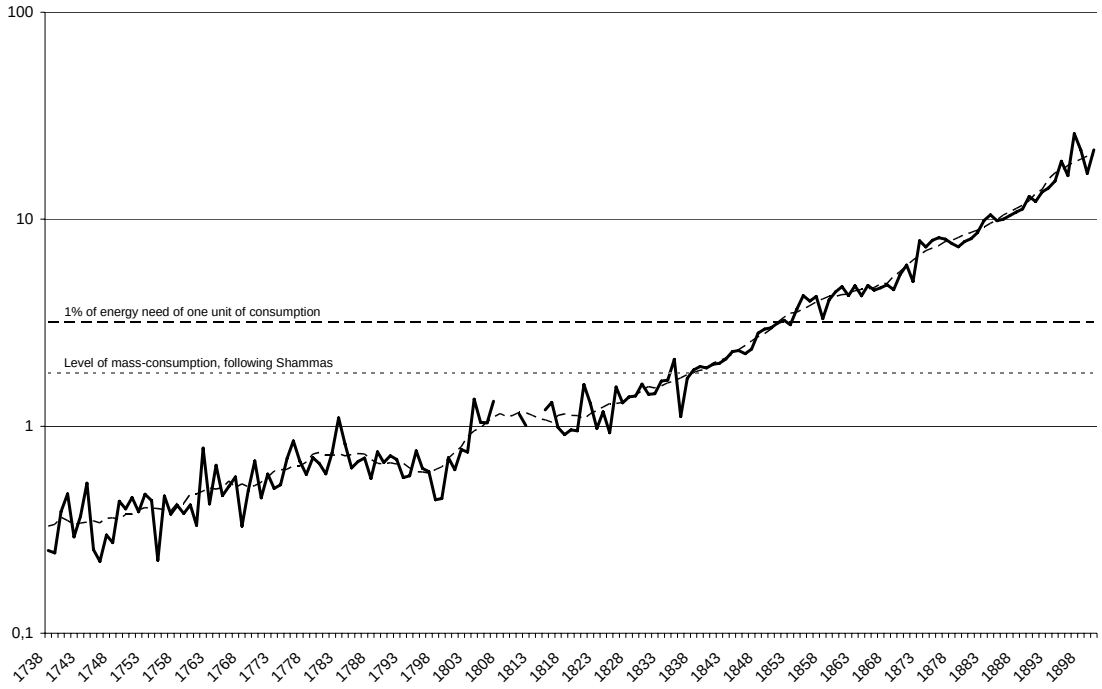
2. The consumption of sugar in Sweden

Since medieval times, the consumption of sugar had increased in Europe.[11] In Sweden, the earliest reference to sugar that we know about is from the account of the funeral of the chief judge (*lagman*) Birger Petersson, in 1328.[12] Consumption would however remain extremely marginal in Sweden at least until the 18th century. In contrast to some other colonial commodities, such as cacao and coffee, sugar was never included in the sumptuary ordinances banning the importation and/or consumption of several luxury goods (*överflödsförordningarna*).[13] Mercantilist policies were certainly imposed on the trade in sugar, but their aim was to support domestic refining of sugar rather than to curb consumption.[14]

[7] Heckscher 1944
[8] Müller 2003; Müller 2004
[9] Rönnbäck 2006
[10] To my knowledge, only two scholars have tried to look at the sugar trade in general, prior to the introduction of the sugar beet in Sweden: Sjöberg 1981/82 and Klason 1892. To this might be added a couple of books and articles concerning specific refineries.
[11] Stols 2004
[12] Sjöberg 1981/82, p 92
[13] "Överflödsförordning", Nationalencyklopedin, http://www.ne.se, 2007-08-14
[14] Rönnbäck 2006

Starting by 18th century, graph 1 shows the per capita consumption of sugar in kg/capita, computed from the (official) net imports of sugar, and in time also including domestic production of beet-sugar.[15]

GRAPH 1. *The consumption of sugar in Sweden, 1738-1900 (annual data and 9-year moving average, kg per consumption unit, logarithmic scale)*



Sources: see appendix A

By the early 18th century, the average annual per capita consumption of sugar was around a quarter of a kilo. Consumption increased slowly (on average 1–2 per cent annually) for several decades, but the trend took a downturn during the 1780s, and especially the 1790s, when prices rose as an effect of the French Revolutionary wars.

In the years 1808–1810, as well as in 1813, there are sudden peaks in the statistics, but this is most certainly due to misleading source materials. These were the years of the Continental blockade. Imposed around Europe in 1806–1807, Sweden officially joined the blockade against Britain in 1809. It seems highly unlikely that the per capita consumption should have more than trebled during such a short time, as the available data indicates. It seems more reasonable to assume that a large amount of the sugar actually is smuggled from Sweden – either to the continent or to Britain. A large amount of sugar was therefore

[15] For sources, see appendix A

not included in the official export statistics, and would therefore wrongly show up as consumed in Sweden given how the data for consumption is calculated in this case.[16] For this reason, these years have been omitted in the graph.

After the end of the Napoleonic wars, consumption of sugar started to increase faster in Sweden – on average an increase of about 3.5 per cent annually during the 19th century. It does not seem far-fetched to assume that consumption of sugar increased in Sweden following the industrial take-off or the introduction of sugar-beet. This is also what many scholars have assumed previously.[17] Somewhat surprisingly, there was no take-off or boom in the trend during the 19th century, neither around the time when Swedish economic growth started to take off (in the 1850s) nor around the time of the introduction of beet sugar (particularly in the 1880s), but rather a quite steady and gradual growth all throughout the century. In absolute terms, this steady percentage growth does however translate into very big absolute increases in per capita consumption by the late 19th century, giving a somewhat misleading impression that this is the time when consumption of sugar really takes off.[18]

As a side note, the growth rate of the consumption of sugar was much higher during the 19th century than during the 20th century. By 1950, consumption reached a peak at 50.2 kg sugar per capita (total consumption, including sugar included in food etc.), implying a growth rate of approximately 1.5 per cent per year during the first half of the 20th century.

[16] We might use this data to estimate how large the smuggling from Sweden was, during these years. If we assume that the per capita consumption showed no significant increase during these years, but remained quite the same as before and after the Continental blockade, i.e. around 1,2 kg per capita, we can calculate how large the real net imports ought to have been given the size of the population. Deducting this from the official figures on net imports, we get a figure for the extra sugar that might have been smuggled from Sweden. In 1808, this figure might have been approximately 5 000 metric tons, increasing to 9 000 metric tons in 1810. As a comparison, in 1808, Britain officially (net) imported approximately 1500 metric tons of sugar, according to Schumpeter 1960, table XVIII.

[17] For example, both Caroline Arcini (Arcini 2003, p 59) and Fredrik Björk (Björk 2007, p 288) argue that consumption increased by the late 19th century following the introduction of sugar beet. None of them do however investigate the issue very closely, but mention the issue briefly while focusing on other issues. In an essay, Peter Englund writes that sugar consumption started to increase in Sweden during the 18th century, but does wrongly attribute this to the introduction of the sugar beet (Englund, 2005, 160). Sugar beet was not introduced in Sweden until the late 19th century.

[18] The figures reported in graph 1 are consistently lower than the per capita consumption figures estimated in Kartell- och trustutredningen, for the years they report such data i.e. 1870–1900 (Kartell- och trustutredningen 1913, appendix table II). Kartellutredningen's estimates are some 5–30 per cent higher than the current author's. Kartellutredningen does not report exactly how they compute their figures, but only state that they are based on official statistics. Since the data on the trade in and domestic production of sugar are the same in both calculations, the lower per capita figures in Kartellutredningen must be due either to them using lower figures for the size of the total population, or them also including treacle in the calculation of the per capita consumption, or some unknown combination of the two.

After 1950, the consumption per capita drop somewhat, only to remain quite stable around 42–44 kg sugar per capita per year, until the end of the 20th century.[19]

How large was the Swedish consumption, in comparison with the consumption in other European countries? Many scholars have tried to estimate the per capita consumption of sugar in Britain, and have reached quite different results. By the early decades of the 18th century, consumption in Britain had reached a level of 4–5 kg of sugar per capita per year, i.e. around 20 times as much as in Sweden at this time. Starting from a very low level of per capita consumption, growth of consumption was more rapid in Sweden during the century, so that by the end of the 18th century, the gap had closed somewhat – British consumers by this time used approximately 5–10 kg of sugar per year, i.e. around 10 times as much as Swedish consumers by the same time. The Swedish consumers would continually catch up with the British – by the middle of the 19th century, people in Britain consumed approximately 15 kg of sugar per capita per year, i.e. 5 times the amount consumed in Sweden at the same time.

Carole Shammas assumes that to be able to sweeten food and drink "regularly", a person would need approximately 24 lb. (approximately 11 kg) of sugar per year. In order to qualify as a "mass-consumed" commodity, however, Shammas thinks it suffices that approximately 25 per cent of the adult population (viz approximately 1/6 of the total population in Britain) is estimated to consume the product regularly – which would require a per capita average consumption of 4 lb. (approximately 1,8 kg) of sugar per year. According to Shammas, Britain reached the lower figure already by the end of the 17th century, and the higher figure a century or so later.[20] Jones & Spang have argued that around the time of the French revolution, sugar had become so widespread – and so 'necessary' – even among the labouring classes in France, that rising prices of sugar did spark riots among the *sans-culottes*.[21]

Shammas' figure for regular consumption of sugar seems however quite arbitrarily chosen. Another measure might be when average consumption reaches a level equivalent to a certain percentage of the energy need (measured in kcal) of a grown-up man (one unit of consumption). If we, for example, assume that a grown-up man consumes food equivalent to 3500 kcal everyday, it would require approximately 9 grams of sugar per day

[19] SJV 2007
[20] Shammas 1990, p 81.
[21] Jones & Spang 1999

to supply 1 per cent, and 43 grams of sugar per day to supply 5 per cent, of the energy consumed. On an annual basis, that would translate into 3.2 and 15.8 kilograms of sugar, respectively.

Sweden had a far lower consumption per capita than did Britain – by the late 1830s consumption levels reached 1.8 kg per consumption unit (i.e. equivalent of a grown-up man) and year – as is shown by the lower dotted line in graph 1. From this time onwards sugar could thus be called a 'mass-consumed' commodity in Sweden, if we accept Shammas' lower requirement. If we instead put the benchmark of 'mass-consumption' at 1 per cent of the total energy consumed, i.e. 3.2 kg of sugar annually, Swedish average consumption reaches this level by the early 1850s, as is shown by the second dotted line in the graph. The average consumption level only reached Shammas' higher figure, of 11 kg per consumption unit and year, by the late 1880s, and 5 per cent of total energy consumed a couple of years later.

It is noteworthy that even if we demand either of the higher benchmark values, sugar was still a 'mass-consumed' commodity around the time that the sugar beet was experiencing its break-through in Sweden in the 1880s. That sugar became a mass-consumed commodity in Sweden is thus without a doubt due to the imports of (mainly) cane sugar, and not the domestic production of beet sugar.

3. The cause of growth of consumption

What would explain this gradual increase in consumption? There are many plausible explanations, the most important of which seem to be increasing income, changing consumer preferences and/or falling prices.

3.1 Increasing income

According to Lennart Schön, growth in GDP per capita exceeded 1 per cent per year in Sweden from the 1850s onwards.[22] The growth in demand of sugar was thus quite much higher than the growth in average income during both the 18th and 19th century (as was noted above, approximately 1.5 per cent per year during the 18th century, and 3–4 per cent per year during the 19th century).

[22] Schön 2000, p 13

3.2 Changing preferences

In the case of Britain, consumption also increased as an effect of changing consumer preferences, in favour of many of the new, exotic commodities. Other foodstuffs were substituted for sugar (often in combination with other luxurious colonial commodities, such as tea or coffee). By the end of the 18th century, English labouring families devoted more than 10 per cent of their family income to the consumption of tea, sugar and treacle. Energy from sugar replaced energy from other – probably more nutritious – sources.[23] Even in poorhouses, sugar became a frequently used good – figuring occasionally in accounts from poorhouses during the late 17th century, but figuring constantly in the accounts from the early 18th century onwards. During the latter century, the poorhouses devoted approximately 2–5 per cent of their total budget on sugar and caffeine drinks.[24] This led to less money spent on other foodstuffs: "If they [the British consumers] had unlimited resources no doubt they would have combined their taste for the new commodities with more cheese and meat. When forced to choose, though, they preferred the sugar, tea, butter, and bread."[25] Unfortunately, it seems very hard to conduct a similar investigation in Sweden as Shammas has done in Britain, since household budgets are not available in Sweden until in the late 19th century.

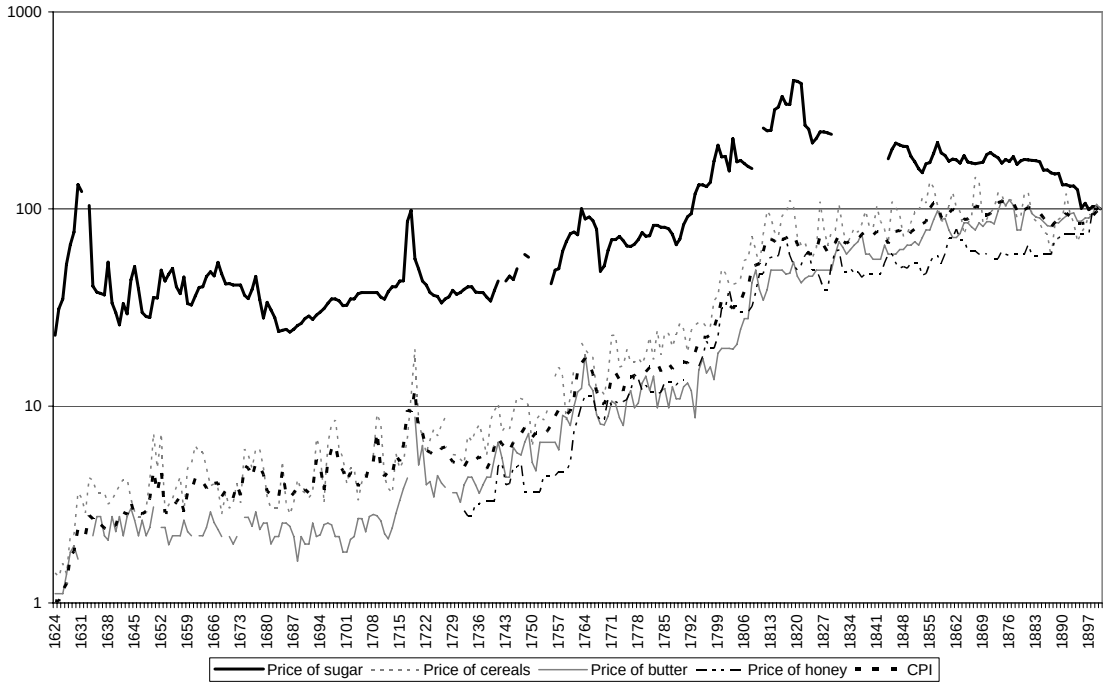
3.3 Falling prices

The third plausible reason behind the growing consumption of sugar in Sweden is the price of sugar, as well as substitute and complementary commodities. The nominal price of sugar fluctuated quite much over time, partly in response to domestic inflation, but partly also in response to occurrences on the international market. What interests us here is the price of sugar relative to other goods – both to a consumer price index in general, but also relative to other foodstuffs in particular. Rodney Edvinsson is currently working to construct aggregated national accounts for Sweden during the period 1668–2005, which is also going to include a new consumer price index. The figures in graph 2 are therefore based on preliminary data, generously provided by Edvinsson. In the graph, the price of sugar,

[23] Shammas 1990, pp 136–137
[24] Shammas 1983, figure 1 & Shammas 1990, table 5.8
[25] Shammas 1990, p 146

cereals and butter is put in relation to the consumer price index constructed by Edvinsson.[26]

GRAPH 2. *The relative price of sugar, honey, butter, cereals and consumer price index (relative/index 1900=100, logarithmic scale)*

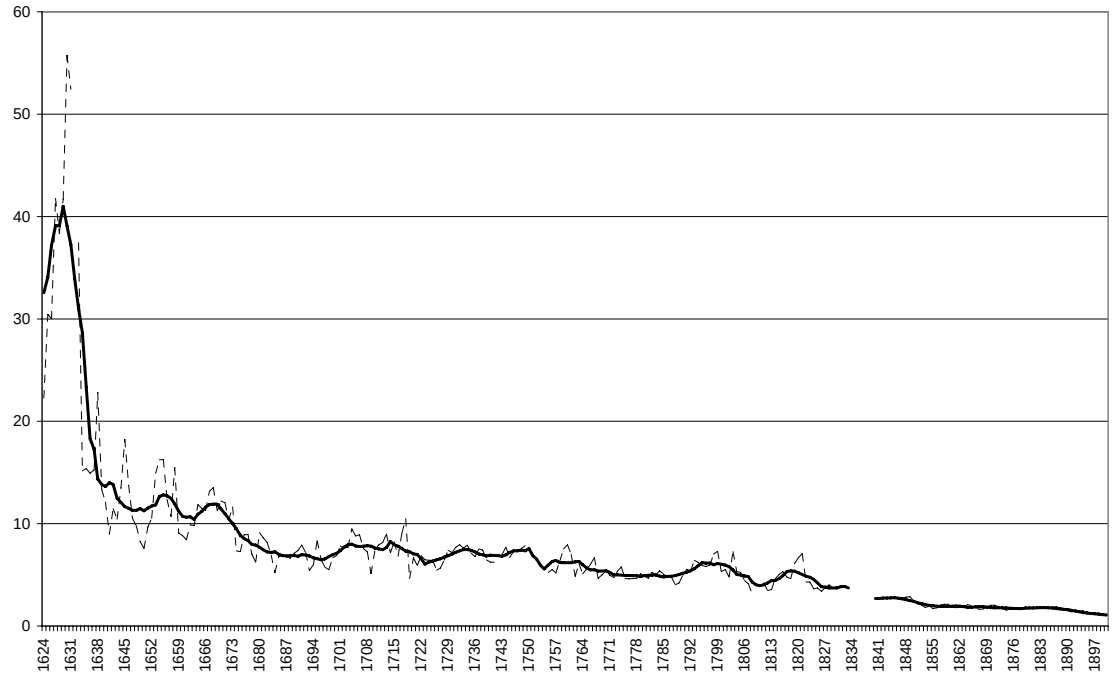


Sources: see appendix B

Sugar experienced a very significant fall in relative price starting during the 18th and intensifying during the 19th century. One might perhaps also note a significant and quite rapid decrease in relative price for a short period of time during the second half of the 17th century. This can be more easily seen in graph 3, where the price of sugar is divided by the consumer price index, so as to give us a relative price of sugar for the period. In the graph, a 9-year moving average relative price of sugar is also included, to make it somewhat easier to discern long-term trends.

[26] Edvinsson 2007a. One might have concerns against a consumer price index constructed over such a long period of time, since a common 'basket' of consumer goods might change quite much over the period, and instead prefer to put the price of the commodity in question (i.e. sugar in this case) in relation to another commodity (for example cereals).

GRAPH 3. *The price of sugar in relation to consumer price index, 1624-1900 (sugar price relative 1900=100, CPI 1900=100, individual years and 9-year moving average)*



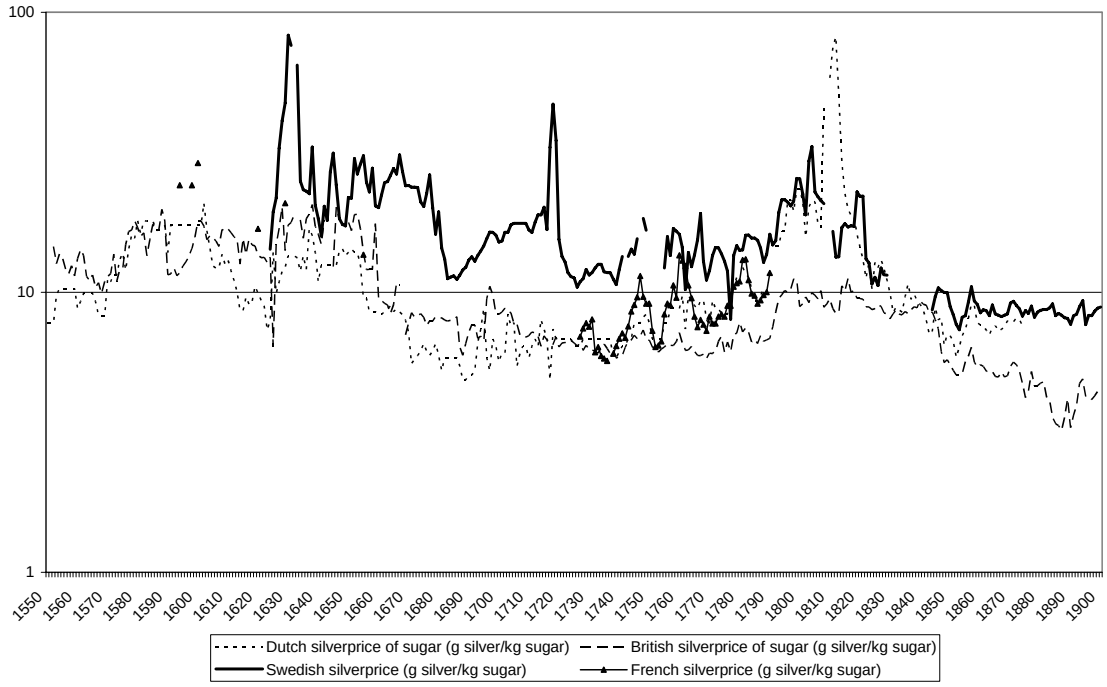
Sources: see appendix B

Looking at the long-term trends of the relative price, there is a major fall in the price of sugar during the second half of the 17th century, until around 1680. For a long period of time, until the middle of the 18th century, the price fluctuated quite much, especially during the Great Nordic war as would be expected, but there is no clearly discernable trend. Starting by the middle of the 18th century, and the following 150 years, finally, the price of sugar was falling (and after the end of the Napoleonic wars falling very steadily, too) in relation to the price of other products. Major international conflicts, such as the Great Nordic War, the American, French and Haitian Revolutions and the Napoleonic Wars, imposed quite large shocks to the price on the Swedish market, as would be expected.

To put the Swedish price in relation to the European ones, one would have to convert the nominal price in Swedish currency into some internationally comparable unit. One possibility of doing this is by using silver as an international measurement, i.e. transforming the price of sugar measured in for example silver daler per Swedish pounds (*skålpund*) into grams of pure silver per kilogram of sugar. The results must be interpreted with caution since it is problematic to convert the Swedish price of sugar into a silver-price, due to the highly fluctuating general price-level in Sweden. Graph 4 does anyway show an estimated

silver-price of sugar in Sweden, in relation to the silver-price in Great Britain and the Netherlands.

GRAPH 4. *Price of sugar in Sweden, UK, France and the Netherlands, 1550-1900 (g silver/kg sugar, logarithmic scale)*



Sources: Swedish prices see appendix B; French, Dutch and British prices from Clark 2007, Luiten van Zanden 2007, van Riel 2007 & Hoffman 2005

As can be seen in the graph, the prices seem to converge, which might be interpreted as closer market integration between the markets for sugar in Europe. This is especially the case if we compare the prices on the Swedish and the Dutch markets, where prices appear to be converging during much of the 18th century, while the Swedish and British markets for sugar show no clear long-term trend towards converging. Closer market integration in northern Europe is also what would be expected, according to the findings of David Jacks.[27]

Such a straightforward interpretation might however miss some of the complexities of the trade in sugar. Prior to the middle of the 18th century, Great Britain was of little importance for Swedish imports of sugar. British prices ought therefore to have had little impact on the Swedish market prior to this time. Only during the second half of the 18th

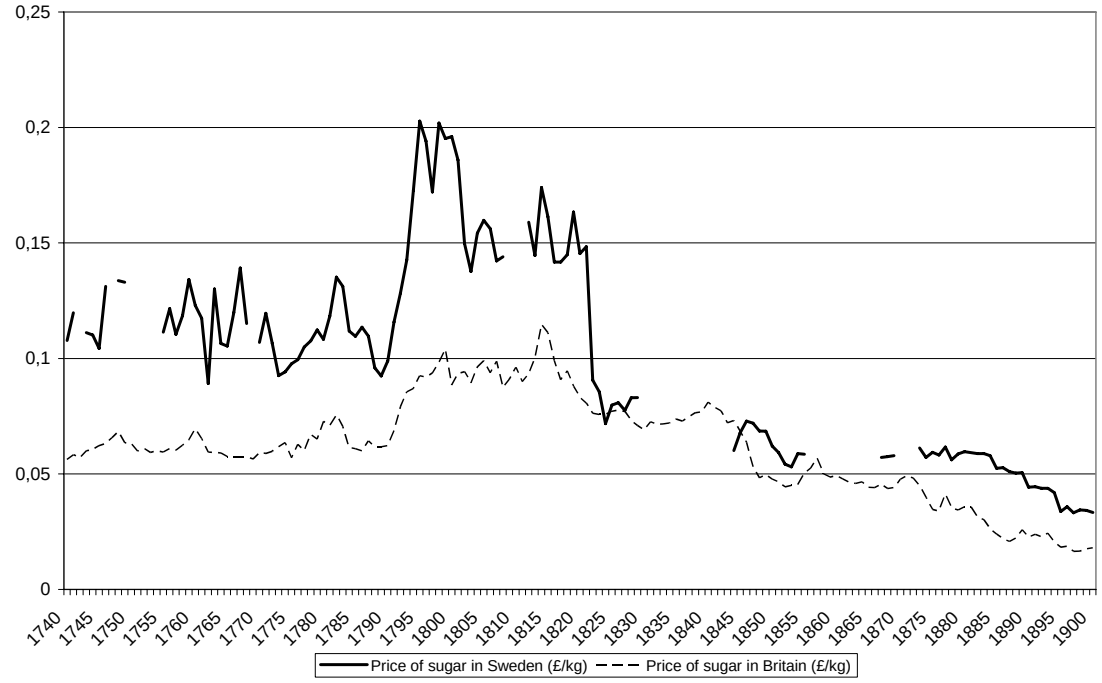
[27] Jacks 2004

century did British exports start reaching Sweden in significant quantities.[28] But at the same time, production of sugar in the British West Indies expanded rapidly, at the same time as international conflicts pushed up the price of sugar on many markets in Europe. These conflicts had a rather small impact upon the British market for sugar, probably since Great Britain to a large degree ruled the waves of the Atlantic. The result can be seen in graph 4 – prices in both Sweden and the Netherlands rise much more rapidly than prices in Great Britain. But at this time, Sweden started to import increasing volumes of sugar from Great Britain. As an effect, prices in Sweden didn't rise as much as the prices in the Netherlands, especially not during the Napoleonic wars and the Continental Blockade at the turn of the century. In relative terms, then, Swedish prices seem to be converging with the Dutch prices. This might however actually be an effect of increasing trade in sugar between Sweden and Britain.

An alternative way of comparing the price of sugar in Sweden to the price in other countries is to convert the Swedish currency into foreign ones using recorded exchange rates. This is possible from the 1740s onward, using recorded data on exchange rates published by Sweden's central bank (*Sveriges Riksbank*).[29] Graphs 5a and 5b show the prices on the three markets, the price on the Swedish market converted into British pounds sterling or Dutch gulden per kilogram, respectively.

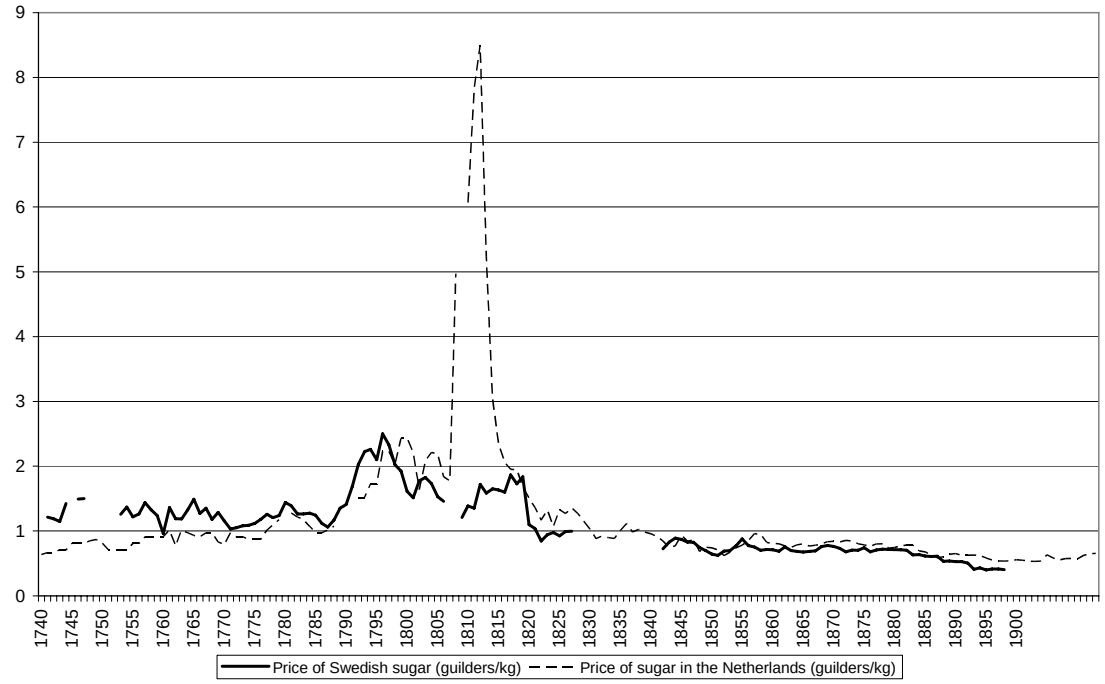
[28] Rönnbäck 2006
[29] Sveriges Riksbank 1931, pp 140–165

GRAPH 5A. *The price of sugar in Sweden and Britain, 1740-1900 (£/kg)*



Sources: Swedish nominal prices see graph 1, exchange-rates from Sveriges Riksbank 1931. British prices from Clark 2007.

GRAPH 5B. *Price of sugar in Sweden and the Netherlands, 1740-1900 (Dutch guilders/kg)*



Sources: Swedish nominal prices see graph 1, exchange-rates from Sveriges Riksbank 1931. Dutch prices from Luiten van Zanden 2007 & van Riel 2007.

In both cases, the graphs show quite the same trend as could be seen in graph 4: the Swedish price converged with the price in the Netherlands during the second half of the 18th century. The price-gap between the British and the Swedish market on the other hand diminished only following the end of the Napoleonic wars. Prices started to diverge somewhat again during the second half of the 19th century when British prices fell more rapidly than the Swedish prices did.

3.4 Regression analysis

To estimate how important each factor was to the growth of consumption, I conduct a very simplistic regression analysis of the available data on prices, consumption and income levels. Table 1 summarizes the results, estimating the equation:

$$\ln Q_{t+1} = a + b * \ln(GDP_t) + c*\ln(price_t) + e$$

where GDP_t is the GDP per capita in year t, $price_t$ is the deflated price of sugar in year t, and Q_{t+1} is the quantity of sugar consumed per capita in the year t + 1, i.e. it is supposed there is a one year time lag between a change in price or GDP per capita, and a change in consumption caused by the price/income change.[30] All values are put in their natural log form, in order to estimate how a change in price or income changes the quantity consumed.[31] The term e is an error term that might be interpreted as the effect of changing preferences, as well as the effect of changing price of complementary goods (such as coffee or tea). The latter would be interesting to include in a model, but since such price data is lacking it is not possible to do this at the moment. The model has consciously omitted the price of the substitute good honey, since the price of honey is very closely correlated to the general price level (see graph 2). Including the relative price of honey would therefore introduce a high degree of multicollinearity in the model, and would most probably not explain anything more than the model already measures.

[30] Data for GDP per capita from Edvinsson 2007b. The results in table 1 do not change significantly if we change the time lag, either to no time lag at all, or to a two-year time lag. There is one exception to this: with a two-year time-lag the term b, i.e. GDP per capita, will have a statistically significant effect in regression 2 as well.

[31] Since all three data-series contain trends (the relative price is falling, while quantity consumed is rising, and GDP per capita is rising at least during later parts of the period), it is not possible to interpret the results as price- and income-elasticities, respectively. If the trend is removed, by making the values stationary, a regression analysis show non-significant results overall.

TABLE 1 *Effects of long-term changes in price and income on sugar consumption*

	Regression 1 – all years	Regression 2 – period before 1810	Regression 3 – period after 1810
B	1.69 (9.43)	1.09 (1.31)	2.02 (16.68)
C	–1.21 (–12.11)	–1.21 (–5.31)	–0.69 (–8.27)
R^2-adj	0.949	0.331	0.97

t-values in parenthesis

As would be expected an increase in GDP per capita had a statistically significant, positive effect upon the quantity of sugar consumed, as can be seen from regression 1. The effect was not consistent over time, though. GDP per capita showed no statistically significant effect during the 18th century (regression 2), which isn't surprising given that Sweden experienced no or very little economic growth per capita during the 18th century. During the 19th century, on the other hand, increasing incomes had a very significant effect (regression 3). The price-level did also have a statistically significant effect upon the quantity consumed, and the relation was negative (i.e. a decrease in price increased the quantity consumed), as would be expected. Falling prices also had an effect in both periods (regression 2 & 3), yet again as we would expect. The model does not explain all of the changes in demand for sugar. During the 18th century, especially, the model was not able to explain more than a third of total increase in consumption (the adjusted R^2 in regression 2). The rest might perhaps then be attributable to changing preferences among the Swedish consumers, as well as changes in consumption and price of complementary goods.

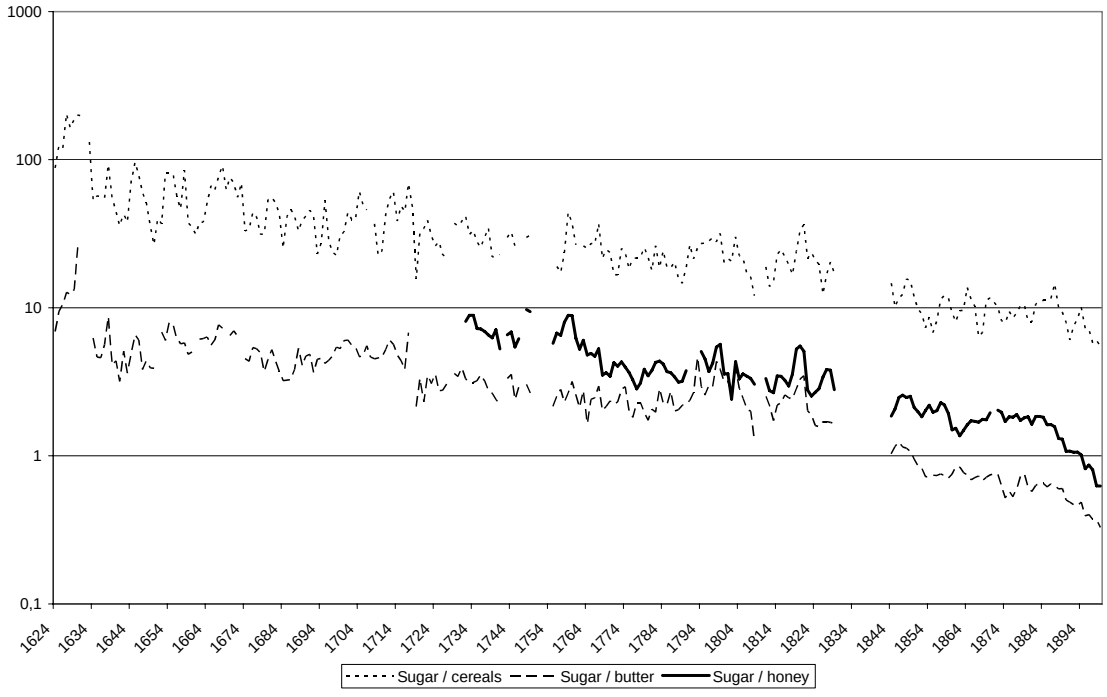
Rising incomes thus contributed to an increasing demand for sugar, but mainly during the 19th century. Mass-consumption, as defined by Carole Shammas, was a fact already some time before the Swedish economy started to experience a sustained economic growth, and is attributable mainly to the decreasing price of sugar, and changing consumer preferences.

4. Just how luxurious was sugar in Sweden?

There is no doubt that sugar was a luxury commodity during the early modern era. But just how luxurious was sugar to a consumer in Sweden? Prior to the introduction of sugar, honey had been the most common sweetener. According to Erik Husberg, consumption of honey was quite considerable already during medieval times.[32]

Graph 6 might perhaps give an indication of how luxurios sugar was, putting the price of sugar in relation to the price of three other basic food items – cereals, butter and honey.[33] In the graph, the price of sugar is divided by the price for the same weight of honey, butter and cereals, respectively, giving an indication of the alternative cost of sugar. As can be seen in the graph, sugar is approximately 50–90 times more expensive than the same weight of cereals, around the middle of the 17th century.

GRAPH 6. *Price differential between sugar and other commodities in Stockholm, 1624-1900 (logarithmic scale)*



Sources: see appendix B

Today, few people would think of sugar as a substitute for other, more nutritious foodstuffs – at least not a good one at that. Carole Shammas has however argued that this

[32] Husberg 1994
[33] See appendix for sources

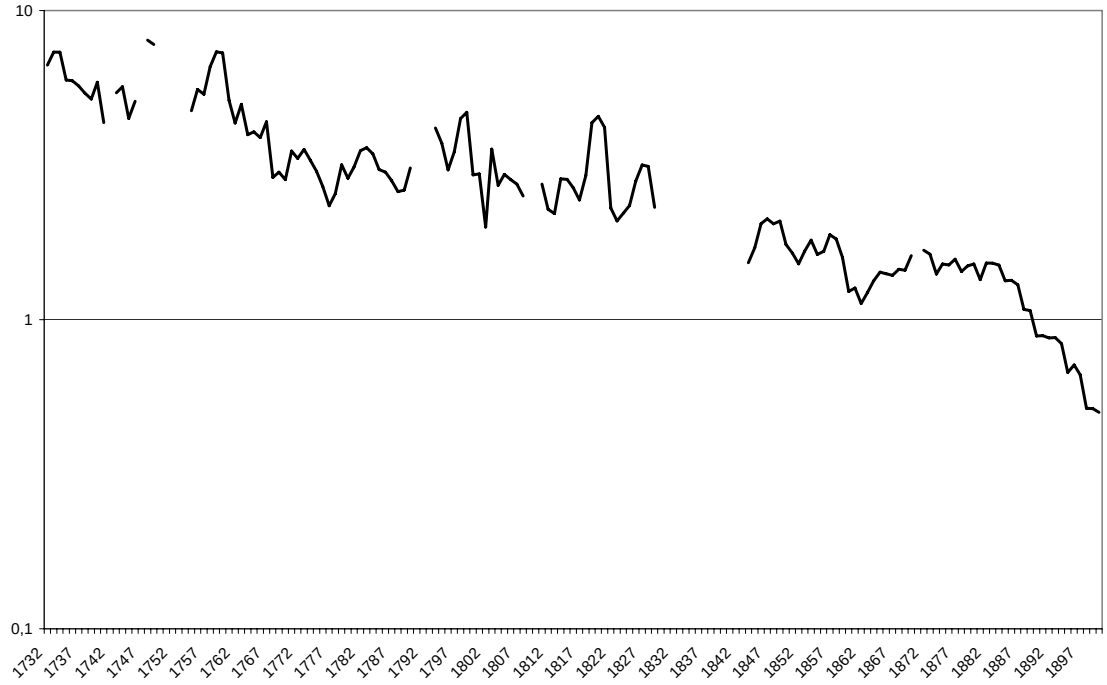
was not how many people at the time considered it, at least not in Britain. Many people of the labouring classes in Britain did actually substitute potentially more nutritious foodstuffs for sugar and tea, and used sugar as a quick and easy source of energy – despite the low nutritional value. This reduced the total calorie intake of labouring classes in Britain, Shammas argues, since the calories one could get per penny was lower for sugar than for most other foodstuffs.[34]

If a similar substitution took place in Sweden, the consumers would have had to abstain from quite a substantial amount of other foodstuffs in order to buy even quite small amounts of sugar. A quick example to illustrate this point: in 1738, average consumption of sugar amounted to a quarter of a kilogram per capita. Looking at the price ratio between sugar on the one hand, and butter and cereals on the other – and assuming that the prices are given and would not change significantly due to a change in demand – consuming a quarter of a kg of sugar would mean each individual would have to abstain from approximately 8.5 kg of cereals, or 0.75 kg of butter. This is roughly equivalent to 12–15 days consumption of cereals for a somewhat richer household.[35] Over time, this ratio diminishes significantly. By the end of the period, sugar 'only' costs five times as much as the same weight in cereals. We can calculate the same quota in relation to the price of butter. The price of 1 kg of sugar is almost eight times higher than the price of 1 kg of butter by the beginning of the period. By the middle of the 19th century the price of sugar is on par with the price of butter. Sugar and honey, finally, are very close substitutes even by our current standards – one can in most cases be exchanged for the other (for examples as sweetener in many drinks or in food). By the early 18th century, sugar was approximately 10 times as expensive as the same amount of honey. The price of sugar, relative to the price of honey, did however drop significantly. But only by the 1890s is sugar as cheap as honey, as can be seen in graph 7. It is then perhaps no surprise that it is by this time that sugar definitely has become a mass-consumed commodity in Sweden (see chapter 2 above).

[34] Shammas 1990, p 137 & table 5.6

[35] Hannerberg 1971, p 94. Hannerberg states that the average consumption of cereals in Sweden at the time often is assumed to be roughly 250 kg annually, but thinks that most people in reality had to make do with much less than that.

GRAPH 7. *Price differential per unit of energy (kcal) between sugar and honey (logarithmic scale)*



Sources: see appendix B

4. The impact of Swedish sugar consumption

4.1. 'Ghost acreage' and labour force

Prior to the 1850s, all of the sugar imported to Sweden originated in areas of production overseas – mainly in the Americas.[36] Even though the Swedish consumption was marginal to total world production, it might still be interesting to know roughly how large 'ghost acreage', as well as how large a slave labour force, the Swedish consumption demanded, to illustrate the impact of the increasing consumption.

[36] Rönnbäck 2006

TABLE 2 *Swedish net imports of sugar, and production on a number of Caribbean islands, chosen years 1738-1850.*

Year	Swedish net sugar imports (tons, muscovado equivalent)	Production Martinique (tons muscovado)	Production Montserrat (tons muscovado)	Production Jamaica (tons muscovado)	Production Cuba (tons muscovado)
1738	500	15 000 *	2 600	17 500	..
1785	1 600	12 000 *	1 400 *	52 000 *	12 000 *
1820	2 500	21 500	1 600	88 500	43 100
1850	10 700	15 000	80	28 800	223 100

Sources: production figures from Deerr 1949. All figures are rounded off to the closest hundred. Swedish import figures see graph 1.

* data missing for this individual year, therefore interpolated from surrounding years.

Table 2 presents the data on total Swedish imports of sugar, parallel to data on production of sugar on a chosen number of islands in the Caribbean. The islands are chosen to illustrate possible areas of origin of the Swedish imports. In 1738, Sweden imported approximately 500 metric tons of sugar, mainly from French sources. Around this time, the French colony of Martinique produced around 15 000 metric tons of sugar per year. The Swedish demand thus constituted approximately 3 per cent of total production on Martinique. By the 1780s, Sweden imported approximately 1 500 metric tons of sugar annually. Britain as well as Denmark would soon become major trading partners, when France experienced a revolution at home as well as on Saint Domingue. The Swedish demand was by this time equivalent to the volume of production on a smaller Caribbean island, such as Nevis, Antigua or Montserrat, or 12.5 percent of the production on Martinique. By the 1850s, Swedish consumption did mainly come from Brazil and directly from the Caribbean. The official statistics do not tell us exactly what islands in the Caribbean the imports came from, but Cuba was most probably a major trading partner. Swedish imports constituted a volume equivalent to approximately 4.5 per cent of total Cuban production.

TABLE 3 *Average yield of sugar in different areas of production in the Americas*

Year	Place	Yield (kg/hectare)
1727	St. Kitts	1 260
1729	Montserrat	1 212
1733	Barbados	2 347
1751	Bahia	1 503
1752	Bahia	1 253
1755	Barbados	2 124
1774	Jamaica	1 581
1776–1796	Jamaica	2 174
1781	Bahia	2 105
1785	St. Domingue	3 485
1788	St. Domingue	2 618
1792–1808	Morelos	2 643
1816	Bahia	2 105
1822	Morelos	3 038

Sources: Schwartz 1985, table 5-4, except for data on Montserrat taken from Sheridan 1974, table 8.3.

In table 3, data on the average yield of sugar are reported from different places in the Americas. Given this data, we can compute what 'ghost acreage' the Swedish consumption might have amounted to. In 1738, this acreage amounted to somewhere between 200 and 390 hectares of land, i.e. approximately 2–4 km^2. By the late 18th century, the 'ghost acreage' amounted to some 500–1000 hectares, i.e. 5–10 km^2. By the middle of the 19th century, the acreage had grown to some 50 km^2. Columns B & D of table 4 summarize these hypothetical calculations on the Swedish 'ghost acreage'.

TABLE 4 *Hypothetical 'ghost acreage' and labour force needed to produce Swedish demand*

Year	A. Swedish consumption of sugar (tons muscovado equivalent)	B. Average yield of muscovado (tons per hectare)	C. Labour force productivity (tons per adult slave)	D. Estimated 'ghost acreage' (=A/B, km^2)	E. Estimated labour force needed (=A/C, number of slaves)
1738	500	1.2–2.3	1.04	2–4	480
1785	1 600	1.6–3.5	0.68	5–10	2 400
1820	2 500	2.1–3.0	0.68 *	8–12	3 700
1850	10 700	2.1–3.0 *	0.68 *	36–51	15 700

Sources: import data, see footnote 14. Yield figures, see table 2. Labour productivity from Sheridan 1974, table 8.3 and Stein 1988, pp 75–76.

* No data available, so estimate is extrapolated from earlier data.

Producing the sugar also needed a workforce, and the sugar plantations were very labour intensive. During the 18th century, this workforce was almost entirely made up of slaves. Richard Sheridan has published detailed plantation data from Montserrat. Here, the 30 largest plantations produced 88.5 per cent of the sugar cane of the island (which translates into 2 300 tons of sugar). These 30 plantations accounted for 3 461 slaves in this year – out of which 2 403 were adults.[37] One adult slave could thus produce approximately 1.04 tons of sugar per year by the first half of the 18th century. The Swedish consumption of 450 tons of sugar by 1738 would under such conditions have needed the labour of some 500 adult slaves.

Over time, the yield figures per labourer seem to have fallen, due to decreasing land fertility. In a calculation from the French island of Guadeloupe, by the second half of the 18th century, the yield per slave labourer is thus significantly lower than the earlier figure from Montserrat – here it is estimated that one adult slave could produce approximately 1 500 pounds of sugar, i.e. 0.68 tons, annually on an average plantation on the island. On smaller or less fertile plantations, the yields per slave labourer was much smaller still – in

[37] Sheridan 1974, table 8.3

some cases as small as 0.2 tons of sugar per slave labourer.[38] If we thus assume that the average yield figure from Guadeloupe remained quite typical during the following decades as well, Swedish consumption of sugar would by the middle of the 19th century very roughly require the labour of at least some 15 000 adult slaves annually (children uncounted). This is equivalent to a third of the population on the Swedish island of Gotland, or approximately the same number of people living in quite large Swedish cities such as Norrköping or Malmö, by the same time.[39] Columns C & E of table 4 summarize these hypothetical calculations on the slave labour force needed for the production of the Swedish demand for sugar.

4.2. Contributing to 'consumer revolution'

That there is a close connection between the consumption of sugar, and the consumption of some other colonial commodities – such as coffee, tea and cacao/chocolate – is not controversial. There are however differing ideas as to what is the driving force behind the correlation. Some scholars believe that an increasing demand for tea or coffee also increased the demand for sugar.[40] Others believe the opposite – that an increasing demand for sugar enabled the demand for coffee and tea to increase, by making these goods more savoury.[41] A regression analysis conducted by Joel Mokyr might be interpreted to support the latter version: the analysis shows that a change in the price of tea has no significant effect upon the consumption of sugar, while a change in the price of sugar did have a significant effect upon the consumption of tea.[42]

The relationship between sugar and caffeine drinks is most probably mutual, but Mokyr's results might be interpreted as if the impact of changing sugar prices, upon the demand for caffeine drinks, is stronger than the vice versa. The timing of the increasing demand for sugar from the late 18th century onwards, shown in this paper, does from this perspective fit well with the results of Christer Ahlberger's study on the Swedish 'consumption revolution'. Ahlberger found that utensils for the consumption for coffee, and especially for tea, had become common in a city such as Göteborg already by the year 1800.

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[38] Stein 1988, pp 75–76
[39] SCB 1969, tables 5 & 12. The total population of Gotland in 1850 was 44 572 people. The population of Malmö was 13 087 and the population of Norrköping 16 916 people.
[40] See for example Mörner 2001, p 101
[41] See for example Black 2004, p 62, or Shammas 1983, p 99
[42] Mokyr 1988, table 2

TABLE 5 *Occurrence of items for preparation or consumption of coffee and tea in estate inventories in different regions in Sweden, 1750-1850. % of all estate inventories.*

	1750		1800		1850	
Area	Coffee	Tea	Coffee	Tea	Coffee	Tea
Göteborg	20	67	53	85	69	62
Västbo	3	6	3	7	44	18
Mark	4	4	3	9	57	10
Skåning	2	3	3	1	18	25

Sources: Ahlberger 1996, tables 7 & 10.

The drinking of tea, and later coffee, was initially concentrated to cities such as Göteborg – while it had not caught on in small rural parishes (Mark, Västbo and Skåning) to any similar degree. In Göteborg in 1750, two-thirds of all people leaving an estate inventory behind did actually possess some utensil for the preparation or consumption of tea. Increasing demand for coffee crowds out the consumption of tea to some extent, but the occurrence of utensils for tea-consumption still grows to 85% by the year 1800. The patterns become clearer if the estate inventories are divided according to the social group of the deceased, as in table 6.

TABLE 6 *Occurrence of items for preparation or consumption of coffee and tea among different social strata in Sweden, in 1800. % of all estate inventories.*

	Coffee			Tea		
Soc. group	I	II	III	I	II	III
Göteborg	100	48	40	100	91	75
Västbo	40	0	0	75	0	0
Mark	100	0	0	100	5	3
Skåning	75	4	5	75	8	0

Sources: Ahlberger 1996, tables 8 & 11

Within the richest social group (nobility, rich merchants, bureaucrats of high station etc), by the year 1800, most people in both urban and rural areas did possess utensils for the

consumption of both tea and coffee. What is striking, however, is the extent to which people from poorer social groups (craftsmen and common workers) in Göteborg also possessed such utensils – by 1800, 75% of all the common workers in Göteborg did actually possess utensils for the consumption of tea. Ahlberger draws the conclusion that the drinking of tea and coffee was a habit of the urban population, and of the nobility.[43] Consequently, urbanization might have contributed to increasing the demand for such luxury goods.

Ahlberger's results show that the consumption of luxury goods was spread out among poorer social groups already by the late 18th century, to a higher extent than might have been expected. His results also show that it is mainly the poorer, rural population that increase it's consumption of such goods during the early 19th century.[44]

4.3. Dental caries – the other side of the coin

Sugar was not only lacking most nutritional benefits – it was also directly damaging for the dental health of the population. In pre-agricultural Alvastra, a study shows that approximately 5 per cent of the population had dental caries.[45] In skeletal remains from medieval times, in cities such as Åhus and Lund, approximately 35–40 per cent of the adult population showed signs of dental caries. By the early 18th century, in Holje, a small village in the south-east of Sweden, approximately 70 per cent of the adult population had dental caries – and in most cases both larger and deeper than during earlier times. In data from the city of Linköping, around the turn of the century 1700–1800, 90 per cent of the adult population had dental caries. Caroline Arcini is convinced that the increasing incidence of dental caries to a large extent is attributable to the increasing demand for sugar.[46]

The tooth-brush was known in Europe already during the 17th century, but did not become popular until the 18th century. Among the findings from Holje, three people (out of a total of 115) had been buried with a tool for cleaning the teeth, a small rake in metal. Their teeth did however not show any signs that these tools actually had been used.[47]

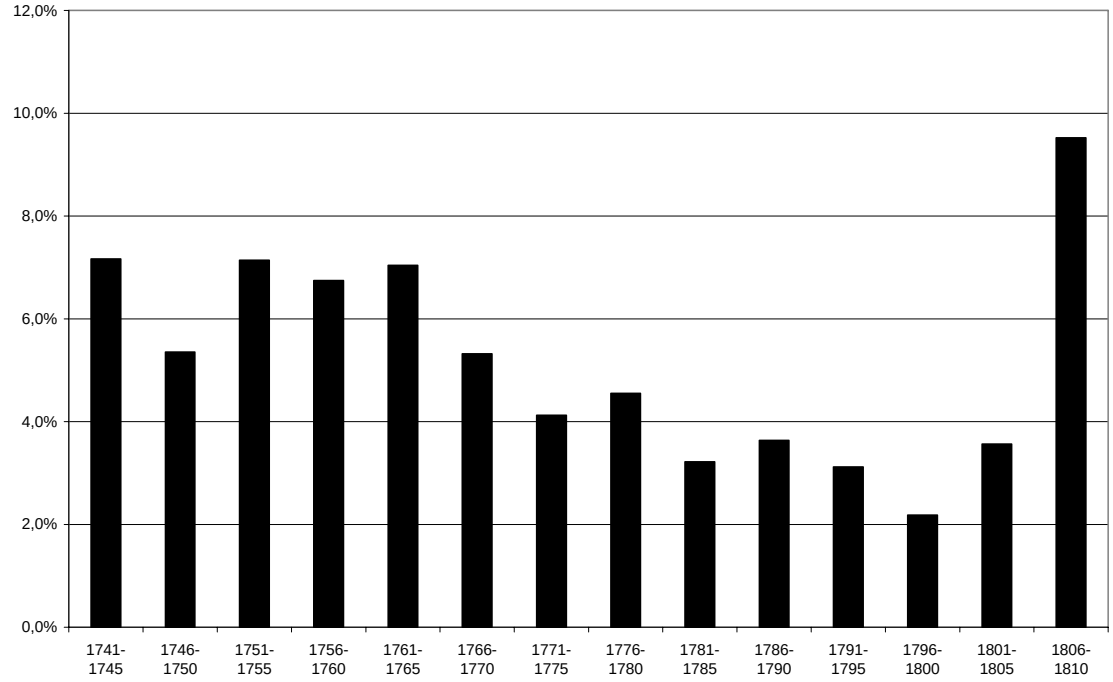
[43] Ahlberger 1996, p 104
[44] Ahlberger 1996, p 109–110
[45] Englund 2005, p 157
[46] Arcini 2006, p 86
[47] Arcini 2006, p 88

4.4. Domestic industry and state budget

The mercantilist trade policies during the 18th century were focusing on protecting and supporting domestic refineries of sugar. These policies were successful to such degree that several refineries were established during the century, and were able to survive. Some of the refineries, for example Carnegie & co in Göteborg, did in time become an important employer locally. But the total employment figures for sugar works in the whole country was very marginal – by the middle of the 18th century, sugar refineries employed around 30 workers in the whole of Sweden, growing to approximately 250 workers by the early 19th century.[48]

Despite the fact that the trade policies didn't have tariff revenue as a primary goal, the contribution that the trade in sugar made to total state revenue was not negligible. After all, the value of the imports of sugar constituted a significant share of the value of all imports already by the 18th century, as is shown in graph 8.

GRAPH 8. *The value of imports of sugar as a share of the value of total imports into Sweden, 1741-1810 (percentages, 5-year averages)*



Sources: Kommerskollegium. Kammarkollegiet .Årsberättelser Utrikeshandel. Series 3

[48] Nyström 1983, bilaga 1

As can be seen in the graph, sugar alone accounted for almost 8 per cent of the value of all imports by the first half of the 18th century. Since the price of sugar fell, the value of total sugar imports could not keep pace with the growth in value of other imports, so the share of sugar diminished over time.

5. Conclusions

This paper has tried to answer three questions: when did sugar experience the shift from being a luxury to being an everyday commodity? What factors are important to explain the shift? What impact did the increasing sugar consumption have?

Regarding the first question, some people assume that this shift happened either following the Swedish industrialization, as an effect of increasing incomes among the Swedish population from the middle of the 19th century onwards, or following the introduction of beet-sugar in Sweden, by the late 19th century. This paper shows that both these ideas are faulty. There was a rather protracted and gradual breakthrough in the consumption of sugar in Sweden during the whole of the 19th century. Even though the Swedish consumption started out during the 18th century from a very low level, at least if compared to the per capita consumption in Britain, the growth in consumption was quite rapid at most times. Following the definition of Carole Shammas, sugar had become a product of mass-consumption in Sweden already some decade before Swedish economic growth started to take off in the 1850s. The introduction of beet-sugar could take over and capitalize on a demand that was already well established.

The most important factors behind the shift was therefore not increasing income among the consumers, but decreasing relative price of sugar and changing consumer preferences during the late 18th and early 19th centuries. One of the most important explanations behind the increasing sugar consumption might then be market integration, causing the Swedish price of sugar to converge with international prices (i.e. to fall relative to other goods). Once people had acquired a taste for sugar, however, increasing incomes during the 19th century would boost the consumption even further.

Since the growing demand was satisfied solely by imports until the late 19th century, the Swedish consumption of sugar needed a 'ghost acreage', as well as a labour force, in the areas of production in colonial America. The 'ghost acreage' was rather small, at most the size of a couple of the very smallest islands in the Caribbean. The Swedish consumption also demanded the labour of a slave population. By the early 18th century,

Swedish consumption of sugar demanded the labour of some 400 adult slaves per year to work the sugar plantations – growing to a size of at least 15 000 adult slaves per year by the middle of the 19th century, just prior to the time when European beet-sugar started to enter the Swedish market.

Increasing use of sugar in Sweden also contributed to increase the demand for caffeine drinks, such as coffee and tea, by making them more savoury. The growth of demand for sugar coincides well in time with the growth in use of such other luxuries, documented by Christer Ahlberger. Sugar did thereby play an important role for the 'consumer' and/or 'industrious' revolution in Sweden. This did however have a price in the form of a decaying dental health status, since dental caries is closely connected to the use of sugar. Even though some sugar refineries, such as Carnegie & co in Göteborg, were large factories by the standard of the time, the direct contribution to the employment of workers was very marginal. The increasing consumption of sugar was not unimportant for the total tariff revenues of the Swedish state. Already during the first half 18th century, sugar alone was estimated to account for approximately 8 per cent of the total value of imports into Sweden – a figure that however does diminish over time due to the falling price of sugar.

Appendix: a note on sources

A. Sources for per capita consumption of sugar estimates

The import and export data of sugar is gathered from the annual reports on external trade by the Swedish Board of Trade (*Kommerskollegium årsberättelser Utrikeshandel*), series 2 & 4. Different sources state quite different figures for how big the loss of weight is during refining of sugar – something between 10 and 40 per cent loss is quite normally stated, the higher loss figures referring to older data, especially from the 17th century. The weight loss is also a matter of decision and market demand. It is perfectly possible to consume both raw and semi-refined sugar, and many people actually did, although most people often preferred refined versions if they could afford them. The by-product of sugar refining – treacle – also becomes more savoury if it contains a larger amount of sugar – so that the price of treacle relative to the price of sugar might have an effect upon choice of how much to refine the sugar. So as not to over-estimate the amount of sugar consumed, it is

here assumed that there is a 30 per cent net loss of weight during refining of raw sugar, and a 20 per cent net loss of weight of refining already semi-refined sugar, imported into Sweden during the 18th century. The loss is lower during the 19th century, due to improved modes of refining, so it is here assumed that these figures by this time are reduced to 20 and 10 per cent, respectively.

Data for the domestic production of beet sugar is taken from Kartell- och trustredningen (1913), appendix table I. Data on the population in Sweden from Statistics Sweden (SCB 2006).

B. Sources for the price of sugar and other commodities

The source and methods for the price of sugar is described in detail in an earlier working paper (Rönnbäck 2007), so I will here only mention this source briefly. The price of sugar is assembled from the accounts of the kitchen of the royal court of Sweden, 1650-1900 – the Court archive (*Slottsarkivet*), Hovförtäringen, series I A, I B, I D & III D. The price is a weighted average price of a couple of different sorts of sugar, in practice very closely correlated to the price of refined, white sugar. The reason why different sorts have been included in the relative price is that the even though the names used for sugar in the accounts change somewhat over time, they seem to refer to the same (or very similar) qualities of sugar. The currencies have been converted into kronor and ören in the way recommended by Jörberg (1972).

The price series for butter and cereals is constructed by assembling the prices from Stockholm reported in Jansson & Söderberg (1991) for the period until 1731, and in Jörberg (1972) from 1732 onwards. In the latter case, the price of cereals used here is constructed as an average of the prices Jörberg reports for rye and barley, to be able to compare it with the figures in Jansson & Söderberg, which apparently is an average of these two cereals. The prices are formally converted into kronor and öre/kg in the same way as the sugar prices are. Jörberg reports no price of honey from Stockholm, so the price included here is the price from the province of Halland. Consumer price index, finally, is preliminary data from Rodney Edvinsson (2007a).

Sources and literature

Unprinted sources

Clark, Gregory (2007): *English prices and wages, 1209–1914*. Data-file provided on the IISG-website, http://www.iisg.nl.

Edvinsson, Rodney (2007a): preliminary CPI-data from project "Sveriges bruttonationalprodukt 1668–2005", provided by the author.

Edvinsson, Rodney (2007b): *BNP per capita i Sverige 1720–2000 i 2000 års referenspriser*. Data-file provided on http://www.historia.se

Hoffman, Philip (2005): *Paris 1450–1789*. Data-file provided on the GPIH-website.

Luiten van Zanden (2007): *The prices of the most important consumer goods, and indices of wages and the cost of living in the western part of the Netherlands, 1450–1800*. Data-file provided on the IISG-website, http://www.iisg.nl.

van Riel, Arthur (2007): *Prices of consumer and producer goods, 1800–1913*. Data-file provided on the IISG-website, http://www.iisg.nl.

Royal court archive (*Slottsarkivet*), accounts from the Royal kitchen (*Hovförtäringen*), series IA, IB, ID & IIID.

SCB (2006): *Befolkningsutveckling; födda, döda, in- och utvandring, gifta, skilda 1749–2006*. Data-file available on http://www.scb.se.

Printed sources and literature

Ahlberger, Christer (1996): *Konsumtionsrevolutionen I: Om det moderna konsumtionssamhällets framväxt 1750–1900*. Humanistiska fakulteten, Göteborgs universitet.

Arcini, Caroline (2003): *Åderförkalkning och portvinstår – Välfärdssjukdomar i medeltidens Åhus*. Riksantikvarieämbetet, Stockholm.

Arcini, Caroline (2006): "Offer för pest, svält och tobak" in Caroline Arcini et al (2006): *Pestbacken*. Riksantikvarieämbetet, Stockholm.

Björk, Fredrik (2007): "Arbetare eller konsument i folkhemmet? – en paradoxal historia" in Victor Lundberg (ed, 2007): *Arbetarhistoria i brytningstid*. Centrum för arbetarhistoria, Landskrona.

Black, Jeremy (2004): *The British seaborne empire*. Yale university press, New Haven.

Curtin, Philip (1969): *The Atlantic slave trade. A census*. University of Wisconsin press, Madison.

Deerr, Noel (1949): *The history of sugar*. Chapman & Hall, London.

Englund, Peter (2005): "Om tandborstens historia" in *Tystnadens historia och andra essäer*. Atlantis, Stockholm.

Hannerberg, David (1971): *Svenskt agrarsamhälle under 1200 år*. Scandinavian University Books, Stockholm.

Heckscher, Eli (1944): "Sveriges framgångsrikaste handelsföretag – Ostindiska kompaniet" in *Historieuppfattning – materialistisk och annan*. Albert Bonniers förlag, Stockholm.

Husberg, Erik (1994): *Honung, vax och mjöd. Biodlingen i Sverige under medeltid och 1500-tal*. Historiska institutionen, Göteborgs Universitet, Göteborg.

Jacks, David (2004): "Market integration in the North and Baltic Seas, 1500–1800", *Journal of European Economic History*, vol 33, no 3, pp 285–329.

Jansson, Arne & Johan Söderberg & Lennart Palm Andersson (1991): *Dagligt bröd i onda tider – Priser och löner i Stockholm och Västsverige 1500–1770*. Institutet för lokalhistorisk forskning.

Jones, Colin & Rebecca Spangen (1999): "Sans-culottes, sans café, sans tabac: shifting realms of necessity and luxury in eighteenth-century France" in Maxine Berg & Helen Clifford (eds, 1999): *Consumers and luxury. Consumer culture in Europe 1650–1850*. Manchester university press, Manchester.

Jörberg, Lennart (1972): *A history of prices in Sweden 1732–1914*. Gleerups, Lund

Kartell- och trustutredningen (1913): *Sockerindustri och sockerbeskattning i Sverige samt Danmark och Tyskland*. Stockholm.

Klason, Peter (1892): *Sveriges sockerhandel och sockerindustri*. P.A. Norstedt & söner, Stockholm.

McKendrick, Neil (1982): "Commercialization of fashion" in Neil McKendrick, John Brewer & J.H. Plumb (eds, 1982): *The birth of a consumer society – The commercialization of eighteenth-century England*. Europa publications, London.

Mokyr, Joel (1988): "Is there still life in the pessimist case? Consumption during the Industrial Revolution, 1790–1850", *Journal of Economic History*, vol. 48, no 1, p 69–92.

Müller, Leos (2003): "The Swedish East-India trade and international markets: re-exports of teas, 1731–1813", *Scandinavian Economic History Review*, vol 51, no 3, pp 28–44.

Müller, Leos (2004): "Kolonialprodukter i Sveriges handel och konsumtionskultur, 1700–1800", *Historisk tidskrift*, 2004, no 2, pp 225–247.

Mörner, Magnus (2001): *Människor, landskap, varor & vägar*. Atlantis, Stockholm.

Nyström, Per (1983 [1955]): *Stadsindustriens arbetare fore 1800-talet*. Tidens förlag, Stockholm.

Rönnbäck, Klas (2006): *Flexibility and protectionism. Swedish trade in sugar during the early modern era*. Göteborg Papers in Economic History, no 4.

Rönnbäck, Klas (2007): *The price of sugar in Sweden. Data, source & methods*. Göteborg Papers in Economic History, no 10.

SCB (1969): *Historisk statistik för Sverige. Befolkning: 1720–1967*. SCB, Stockholm.

Schumpeter, Elizabeth (1960): *English overseas trade statistics 1697–1808*. Clarendon press, Oxford.

Schwartz, Stuart (1985): *Sugar plantations in the formation of Brazilian society. Bahia, 1550–1835*. Cambridge university press, Cambridge.

Shammas, Carole (1983): "Food expenditures and economic well-being in early modern England". *Journal of economic history*, vol 43, no 1, pp 89–100.

Shammas, Carole (1990): *The pre-industrial consumer in England and America*. Clarendon press, Oxford.

Sheridan, Richard (1973): *Sugar and slavery. An economic history of the British West Indies, 1623–1775*. Canoe press, Barbados.

SJV (2007): *Konsumtion av livsmedel och dess näringsinnehåll. Uppgifter t.o.m. år 2005*. Statens Jordbruksverk, statistikrapport 2007:2.

Sjöberg, Gustav (1981/82): "Sockerindustrins historia i Sveirge intill frihetstiden", *Karolinska förbundets årsbok*, 1981/82, pp 90–148.

Sombart, Werner (1967): *Luxury and capitalism*. University of Michigan press, Ann Arbor.

Stein, Robert Louis (1988): *The French sugar business in the eighteenth century*. Louisiana state university press, Baton Rouge.

Stols, Eddy (2004): "The expansion of the sugar market in Western Europe" in Stuart Schwartz (ed, 2004): *Tropical Babylons – Sugar and the making of the Atlantic world, 1450–1680*. University of North Carolina press, Chapel Hill.

Sveriges Riksbank (1931): *Sveriges Riksbank 1668–1924. Bankens tillkomst och verksamhet*. P.A. Norstedt & Söner, Stockholm.

Sylwan, Eilif (1932): *Den svenska betsockerindustrien I: Före Svenska Sockerfabriks Aktiebolagets bildande 1907*. SSA, Malmö.

Wallroth, K-A (1918): *Sveriges mynt 1449–1917. Bidrag till en svensk mynthistoria*. Numismatiska meddelanden XXII, Svenska numismatiska föreningen.

Watts, David (1990): *The West Indies. Patterns of development, culture and environmental change since 1492*. Cambridge university press, Cambridge.

Woloson, Wendy (2002): *Refined tastes – Sugar, confectionery, and consumers in nineteenth-century America*. John Hopkins university press, Baltimore

Göteborg Papers in Economic History

Available online at S-WOPEC: (http://swopec.hhs.se/gunhis/)

1. Jan Bohlin: Tariff protection in Sweden 1885-1914. 2005.
2. Svante Larsson: Globalisation, inequality and Swedish catch up in the late nineteenth century. Williamson's real wage comparisons under scrutiny. 2005
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