



GÖTEBORGS  
UNIVERSITET

Lennart Andersson Palm

## Sweden's 17<sup>th</sup> century – a period of expansion or stagnation?



Institutionen för historiska studier, Göteborg 2016



## *Abstract*

Sweden's 17th century – a period of expansion or stagnation?

Demographic developments in Sweden during the Early Modern Period remain to a large extent unknown. Population totals for periods before the 18th century are debated. The population figure for ca. 1700 is mostly accepted among historians; the average growth during the 17th century - an important period in Sweden's history - is however disputed. The calculation of the total population of Sweden in 1630 is crucial for any growth estimates, as the years around 1630 have the best source material of the century.

This article concludes that Sweden had an average growth rate of some 0.6 per cent from 1630–1700, much higher than earlier estimates among historians; placing Sweden within the dynamic North Sea development zone of the time, led by the Netherlands and England.

The arguments for this conclusion are derived from three independent groups of sources, 1) households according to poll tax registers and contemporary data on mean household sizes, 2) vital data from church records, and 3), calorie consumption levels taken from a great variety of sources including cattle tax registers, land surveys and tithe records. All the material points in the same direction.

Arguments for a big population in 1630 followed by relatively slow growth tend to be based on sources not from the 17th century, but rather on data on household sizes, social and demographic structure from the late 18th century, extrapolated backwards. When it comes to consumption levels, the proponents of a high population figure miss the importance of the fact that during the 17th century Sweden went from a net exporter of cereals to a big net importer, with imports for periods at the end of the century maybe feeding as much as a fourth of the population.

*Keywords:* Scandinavia, Sweden, Demography, Agriculture, Cereal imports, Consumption, Growth, Early Modern Period, 17th Century, Rodney Edvinsson.



## Sweden's 17<sup>th</sup> century – a period of expansion or stagnation?

### Introduction

In Swedish historiography the 17th century is often called Sweden's "Great Power Period". The reason is the country's immense geographical and political expansion by military means, even hammering the Army of the Holy Roman Empire in the Thirty Years' War. This new position of power allowed Sweden to exert considerable influence on the Westphalian Peace 1648, with profound consequences for Europe into our times. At the end of the 17<sup>th</sup> century Sweden controlled large areas in northern Europe, Finland, the Baltic countries, and parts of northern Germany. Big swaths of Denmark and Norway had been annexed.

The expansion rested on several pillars. In the 16<sup>th</sup> century an early modern state had been established. In comparison with many other European countries it was characterised by a high degree of centralisation and an increasingly effective state bureaucracy. In Swedish historiography the international commercial aspects of 17<sup>th</sup> century Sweden have been thoroughly studied.<sup>1</sup> During that century the country became one of the leading exporters of metal, supporting, for example, the Industrial Revolution in the beginning of the 18<sup>th</sup> century by providing 82.5 per cent of England's iron imports and 40 per cent of its iron needs. Before that Sweden had had a monopoly on the European copper market for a century.

However some important aspects have, in my opinion, been given too little attention; this pertains in particular to population development, agricultural production and nutritional standards. The immense archives produced by the bureaucracy of the time could give us more of annual data, total production levels, and the relations between population and nutritional needs and means could be studied more intrusively than has been done. Was the 17<sup>th</sup> century really a century of stagnation in Sweden as is maintained by a traditional interpretation among historians, which is still prevalent in recent scholarship?<sup>2</sup>

In this article I will present a new interpretation of the population development, agricultural production and nutritional standards in 17<sup>th</sup> century Sweden. I will use both evidence from my earlier works, which are not available in English, and data from two recent research projects in which I have participated.<sup>3</sup> Parts of the interpretation contradicts the conventional picture of the century as a period of stagnation and deteriorating living conditions. The different types of evidence seem to open for a new synthesis, strengthening a new interpretation of Sweden in the 17<sup>th</sup> century, as a dynamic society with an important part in an economic and social take off for new forces around the North Sea.

I will refer to two areas: *Sweden within its current borders* and to *Sweden proper*, which is within the borders before 1645. Finland, which belonged to Sweden before 1810, is excluded. By also including Sweden within today's borders my studies allow comparisons with statistics for later periods and includes the agriculturally very important areas conquered from Denmark in 1658. The two Swedens are shown in the following figure.

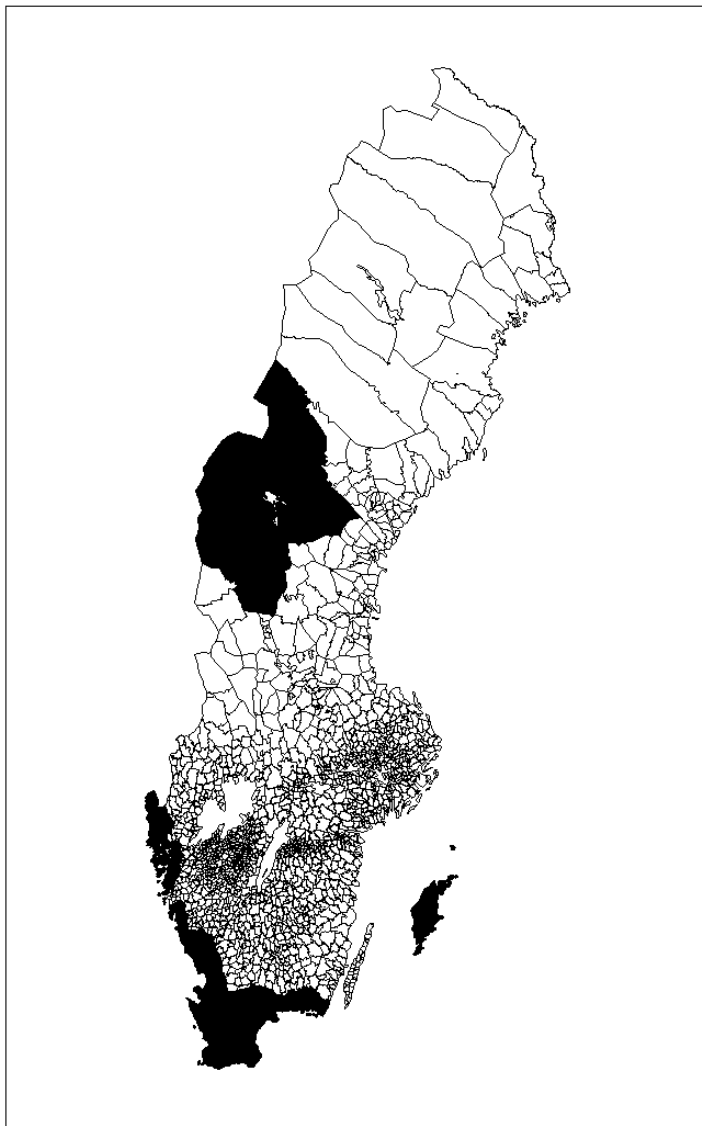
---

<sup>1</sup> Heckscher 1969, p.101ff, 110f.

<sup>2</sup> For example Myrdal 2011 p. 102ff.

<sup>3</sup> Palm 2000, 2001, 2012a, 2012, 2013; Hallberg, Leijonhufvud, Linde & Palm 2016; Linde 2012.

**Figure 1. Sweden of today and “Sweden proper” within the borders before 1645.**



Note: White areas = “Sweden proper”; black areas belonged to Denmark-Norway before 1645.

## Historical populations of Sweden

The demographic development in the Early Modern Period is a controversial question in Swedish historiography. Official population statistics of high quality were introduced in Sweden in 1749 (“Tabellverket”, *Tbv*). After that date, it is easy to find very accurate figures for Sweden’s population total. For the period 1700–1749, fairly congruent estimates have been made; the most convincing is that of Widén (1976).<sup>4</sup> For the 16<sup>th</sup> and 17<sup>th</sup> centuries, a couple of population estimates, very diverging, have been made for the years 1571 and ca. 1630, based on especially rich source materials for these years. In this article, I present my interpretation focusing on the period ca. 1630–1700.

In about 1880, the statistician and archivist Hans Forssell estimated the size of the Swedish population in Sweden proper 1571. He based himself on the *first Älvsborg ransom tax* lists of households (i.e. cattle owners) and added to these the number of households of those privileged tax free, mainly the nobility, and finally, he multiplied the total by an assumed average household size (MHS) of about 5 individuals. His estimate has been questioned as it implies a remarkably high rate of growth when compared to the population figures for the 18<sup>th</sup> century.<sup>5</sup> A comprehensive research program in the 1970s established that settlements in Sweden proper underwent rapid growth in the period up to 1600, which, without doubt, indicated a steep population rise, at least for that period.<sup>6</sup>

In this article I will not discuss the estimates for 1571, but two rather contradicting interpretations of the demographic development in the period ca. 1630 – ca. 1700. Investigating the trend of this period is crucial for the understanding of an important period of the history of Sweden. In the following studies I will first try to get a grasp of the total population number ca. 1630 using the number of households and household sizes, the 1620s being a period for which data on households are richer than for any other period before the 18<sup>th</sup> century. A comparison of this estimate with the widely accepted population total for ca. 1700, will indicate the average population trend for the period. In a second population study I will use evidence from vital records in the parish archives to follow the demographic development during the period ca. 1630-1700 on an annual basis. In a third study I will discuss the evidence relating to cereals and animal consumption limits in the 17<sup>th</sup> century and what population figures they might have allowed. I will then compare the results from these three studies and show what population ca. 1630 they indicate and the resulting population trend for the rest of the 17<sup>th</sup> century. An important task all along will be to scrutinize arguments against a low population estimate and its result, an on average fast population growth 1630-1700.

But first I will consider population estimates from households.

### Population from households 1630 according to Sigurd Sundquist

Forssell calculated the Swedish population in 1571 by multiplying the number of households with an assumed MHS. The same method, with important differences, was, used by Sigurd Sundquist – an amateur historian, professionally a military major. According to his study the population in ca. 1630 was about 900,000 within the borders of Sweden proper of that time.<sup>7</sup> Sundquist’s result has until now mainly been accepted by Swedish scholars.<sup>8</sup> First Sundquist’s methods have to be scrutinized.

---

<sup>4</sup> Widén 1976.

<sup>5</sup> Heckscher 1936, pp. 383-384.

<sup>6</sup> *Desertion* 1981.

<sup>7</sup> Sundquist 1938, pp. 278–280.

<sup>8</sup> Sundquist’s estimates have been accepted by among others Heckscher 1969, p. 134; Hofsten & Lunds tröm 1976, p. 13; Lindegren 2000, Myrdal 2011, p. 104, Schön & Krantz 2015. Rodney Edvinsson (2015) preferred the population estimate made by Sundquist, minus 5 per cent

Sundquist's evidence was mainly the so-called "Mill Tax Lists", which were compiled in 1628, and his calculations required several steps. As an example of his method, Table 1 shows his calculations for several *härad*s in the county of Småland (a *härad* was a fiscal and judicial district consisting of between 2-35 parishes, similar to the English county division, "hundred").

**Table 1. Categories from the Mill Tax List for 1628 used by Sundquist for härad**s in Småland.

Social category	Sum
Couples	6,945
Widowers and male lodgers	295
Widows	141
Female lodgers	547
Sum of persons; couple = 2 persons	14,850

Note: The following *härad*s are included: Tveta, Vista, Mo, Norra Vedbo and Södra Vedbo, Östra; Sundquist had to estimate figures for Östra *härad* from an alternative list for Älsborg's Second Ransom; Female lodgers = "Hus- och inhyseskvinnor".

Source: Sundquist 1938, p. 182ff.

Sundquist accepted the number of couples given in the source material from the area, but thought the figures in the other categories in Table 1 were too low. In order to account for these perceived flaws, he used proportions, or "indexes", taken from official statistics for the area from 1757–1772 to multiply what he thought to be the assumed incomplete categories in Table 1.

**Table 2. Sundquist's first supplement.**

Social category	Proportions 1757–1772	Sum
Couples	100	6,945
Widowers	5	347
Widows	23	1,597
Maidens	53	3,681
Bachelors	59	4,098
Sum of persons; couple = 2 persons		23,613

Source: Sundquist 1938, p. 189ff.

Children below 12 years of age were exempt from the mill tax in 1628. Although the age limit was 12 years Sundquist, for unknown reasons, here added 40 per cent for children "under 15" years of age, primarily based on age proportions on Møen – an island in Denmark – in 1645 and averages from the official statistics for 1757–1772. By the formula  $[23,613 + (0.4 * X) = X]$  he reached a "preliminary sum" of 39,355 people in the area in 1628.

To get what he called a "probable minimum" sum for his population estimate he then turned to "households". To get the total number of households, Sundquist interpreted every category in Table 1 as separate households, which totalled 8,211.<sup>9</sup> He then multiplied this figure by a mean household size (MHS), 5.63, taken from the official statistics for the area of

<sup>9</sup> Sundquist added an estimated 283 households from Östra *härad* taken from a cattle tax list (p.188).



1757 and calculated on the basis of the sum of “households” in the same statistics. His population estimate now rose to 46,288 individuals.

Sundquist knew that *Tbv* explicitly excludes the households of the soldiers, the poor, and the wretched (“*elända*”). Sundquist tried to estimate their number as well in order to get what he called a “probable approximate maximum” by adding, as he writes, “for example”, 10 per cent for assumed missing households in the *Tbv*, i.e. 820 households. Multiplying 820 by an assumed MHS of 3 people per such household, he got ca. 48,600 persons in the area.

By making these calculations, Sundquist increased the figure in the original source by 212 per cent. In my opinion, however, presumed deficiencies of contemporary data do not justify taking proportions from statistics 150 years later. It is clear that important parts of Sundquist’s assumed household, demographic and social structures are not based on source material from the period that his calculations are meant to describe. This evident weakness in Sundquist’s method, indirectly accepted by most of today’s Swedish historians, needs a critical recalculation.

### **An alternative calculation 1630 from household data**

The obvious weaknesses in Sundquist’s method begs a recalculation. For that purpose I used Sundquist’s excerpts from the War Archives (Krigsarkivet) in Stockholm. Sundquist extracted information from three different kinds of tax lists, namely *hjonelagslängder* (literally lists of couples), *mantalslängder* (Mill Tax Lists), and *Älvsborgs lösen 1613* (Älvsborg’s Ransom 1613). The first type of sources lists households who had to pay a temporary extra personal tax from 1609–1612.<sup>10</sup> The *mantalslängder*, from 1627 into the 20<sup>th</sup> century, should contain a record of all people that had to pay this kind of poll tax (initially people aged 12 and older, from 1652 people between the ages of 15 and 63).<sup>11</sup>

In my calculations the Älvsborg’s (second) ransom material is preferred for several reasons.<sup>12</sup> This tax was not an ordinary tax, but a very special one and extremely tightly controlled.

#### *Älvsborg’s Second Ransom, 1613–1618*

The second Älvsborg ransom was a consequence of Sweden losing the Kalmar War (1611–1613) against Denmark-Norway. The Danes, once again, occupied Sweden’s then only port to the North Sea and guarded by the Älvsborg castle in present-day Gothenburg, and so potentially cut off all Sweden’s trade with the economic centres of the Netherlands and England. In order to redeem the port, a ransom of one million *riksdaler* had to be paid. This enormous sum was to be paid in six parts from 1613–1618.

The historian Sven Lundkvist (1974) studied the lists. In order to manage its collection, a special bureau was created under the leadership of four of the leading Swedish administrators. In addition, the bureau employed many bookkeepers, auditors, and scribes. Special regional commissars were appointed to collect the tax in cooperation with the bailiffs. They organised compulsory meetings which the peasant-farmers who were required to attend together with the clergy and local officials in the *härad*s and parishes. The bailiffs and priests were obliged to bring lists from their archives, for example, previous tax lists, tithe records, and communion records. The pressure on the regional and local collectors was enormous. A

---

<sup>10</sup> Bergfalk 1893, p. 117ff.

<sup>11</sup> Lext 1979.

<sup>12</sup> For the different provinces I used the following lists (ÄL=Älvsborg’s second ransom, HJL = *hjonelagslängder*): for Kopparberg’s län, Småland, Stockholm’s län, Värmland, Västerbotten, Älvsborg’s län the lists from ÄL, preferably from the latest payment term; for Södermanland and Uppland mostly HJL; for Västernorrland ÄL+HJL. For Närke, the population figures were calculated by linear interpolation between estimates for 1571 and 1699.

compulsory oath was important for religious people. Finally, according to Lundkvist, noblemen who did not pay could have their possessions seized, while peasant-farmers who did not pay had their belongings confiscated and sold if they did not come up with the money.

In connection with the last, sixth instalment, the control efforts reached their maximum. Who was liable to pay the tax was again described in great detail, as were the ways to control that no one dodged.<sup>13</sup> The only group exempted from the tax were the peasant-farmers and crofters which belonged to the same village as their master's manor and soldiers "on campaigns", but still their families had to pay. Retrospective comparisons with the lists from the five earlier instalments were compulsory. How many persons every peasant farmer had included in their households previous years should be investigated, be it "sons, sons in law, married farmhands, sons, daughters, maids, married or unmarried, 'husmän' or 'huskvinnor', and crofters, in newly built or old crofts, married and unmarried." "Husmän" and "huskvinnor" were mostly elderly people, living in or in small separate houses on their own. Cadastres were to be invoked as a frame for the investigations. For every cadastral unit the number of households should be investigated (literally "hjonelag", married couples, households). These checks should also include the tax exempt households.

Not only should earlier tax records be used for controls, but the personal economic records of the clergy should also be brought to the taxation meetings. The records included specified accounts for the so called "påskapenningar", literally "Easter money", fees that had to be paid to the priests since the Middle Ages. "Price lists" for different church services were published occasionally in the 16<sup>th</sup> century. In 1617 it was decided that the priests should have one *öre* for every person given absolution and communion, including "sons, daughters, sons in law, daughters in law, hired servants and maids" - parish's artisans were also included. The Crown had good reasons to believe that these records included most of the population.<sup>14</sup> The rigorous instructions implied that practically all people 15 years of age and above should be registered in the Älvsborg tax lists.

However instructions like these are a normative source. The fact that such sources cannot be taken as representing reality is well known among historians. Were the instructions followed in practice?

#### *Internal source criticism.*

There are practically no alternative contemporary nominative lists to check the ransom lists – the oldest Swedish *husförhörslängder*, catechetical lists, date in the late 1630s, and parish vital records contemporary with the Älvsborg's second ransom records can be counted on one hand's fingers. The records for the "påskapenningar" were the private property of the priests and have hence been destroyed over the centuries.<sup>15</sup>

One way of evaluating the source value of the Älvsborg records is their own evidence. Are they internally contradictory? Is their numeric evidence obviously unrealistic? Plowing through hundreds of pages from the Älvsborg's parish lists yields some important observations. The first is that their households were listed in the same order as the tax assessment units ("jordeboksgårdar", "jordeboksmantal") in the Crown cadastres. These cadastres at the time covered almost all inhabited land.<sup>16</sup> The cadastral frame must have been a strong control tool for the commissars, bailiffs and their superiors.

The second observation to be made concerns households. Over time cadastral units were subdivided into more and more farmsteads and crofts (households). Especially two

---

<sup>13</sup> Lundkvist 1974, p. 197f.

<sup>14</sup> Lundkvist 1990, p. 5ff.

<sup>15</sup> The unique "påskamålslängd" from Luleå 1559 shows what have been lost with these lists.

<sup>16</sup> In later records all households were distributed according to almost the same number of cadastral units that can be found in the beginning of the 17th century.

groups of households could be expected to be underrepresented when bailiffs investigated the cadastral units – those of the tax exempt households mentioned above, but also those of poor people that had no means to pay. Skimming through the parish lists poor households are found in practically all parish lists studied. One also gets an overwhelming impression that the households of the tax exempt households are explicitly recorded. (The latter is not always the case in the tithe records and later “mantalslängder”).

So far checking the ransom lists in this way ensures in some degree that *the number of households* might be fairly accurate. But by this method other possible deficiencies elude us. One is that *some categories within the household* could be excluded. Not least there must have been a strong temptation for unmarried sons and farmhands of military age to try to avoid registration altogether. Lundkvist concluded - once you got into the Crown’s papers you were stuck. Avoidance by male youths would, other things kept equal, result in a biased sex distribution in the lists.

The following table shows the distribution found for most parts of “Sweden proper” in the Älvsborg lists.

**Table 3. Sex distribution from parish lists ca. 1620.**

Area	Female/male
Dalsland adults	116/100
Skaraborg’s län adults	113/100
Älvsborg’s län (exkl Dalsland) adults	119/100
Södermanland tre härad	125/100
Jönköping’s län adults	108/100
Västerbotten adults	110/100
Ängermanland adults	112/100
Östergötland adults	102/100
Kalmar län adults	120/100
Dalarna adults	127/100
Västmanland adults	110/100
Uppland (incl. SödertörnI) adults	115/100
Närke adults	117/100
Värmland adults	104/100
Kronoberg’s län adults	111/100
Kind’s härad children	111/100
Mark’s härad children	116/100
<b>All areas (unweighted mean)</b>	<b>114/100</b>

Note: For Södermanland the information is taken from a uniquely comprehensive kvarntullsmantalslängd of 1628 and the number includes children 5 years old and older.

Source: Sundquist 1938, tables for Älvsborg’s ransom tax for each area, for Södermanland ibidem, p. 61.

Assuming that proportions in the *Tbv* ca. 1750 are significant also for the 17<sup>th</sup> century gives a strong indication that men did not dodge more frequently than women, gender distribution in Sweden was about the same in the Älvsborg’s ransom lists as in *Tbv* 1750 (113/100). But as a main theme in this article is that the figures from 18<sup>th</sup> century *Tbv* cannot, taken by themselves, represent the situation 120 years earlier. Very few investigations of the gender distribution for the first half of the 17<sup>th</sup> century have been conducted. For Bygdeå parish in northern Sweden a ratio of 153 women per 100 men 153 women has been suggested for 1621;

in 1639 the proportion might have risen as high as 219/100. Here military drafts and war losses are the explanation.<sup>17</sup> But the source material here is weak and the figures are to a large extent inferred from other studies and areas. Much lower proportions are found a bit later in the 17<sup>th</sup> century for several parishes in Dalecarlia with better sources, in the eastern parts of that province the average ratio was 115/100, and in the western parts somewhat lower.<sup>18</sup> But high proportions of women have also been found – in the parish of Björskog in the middle of Sweden the proportion in 1643 was 130/100.<sup>19</sup> However the proportions from the local studies do not seem to indicate that the figures in Table 3 should be discarded as obviously unrealistic.

Subject to the ransom tax were people above 15 years of age. To avoid the tax it must have been tempting to give teenagers above 15 ages that were in fact too low. To avoid this type of tax dodging authorities in some regions started recording also the children below the tax age limit. By comparing successive lists the bailiffs could have the household heads explain why the children recorded as existing one year did not appear in the subsequent year – had they moved, or what? Even just the possibility of such a check would put pressure on people to report properly. In the following tables the evidence from lists enumerating children is given.

**Table 4. Proportion of children to total populations in Älvsborg's ransom parish lists ca. 1620.**

Härad	Mean	Maximum	Minimum	Std. Deviation	Number of parishes
Ale	0.49	0.54	0.44	0.04	9
Flundre	0.39	0.44	0.30	0.05	4
Frökind	0.49	0.54	0.43	0.04	7
Gudhem	0.47	0.53	0.41	0.04	18
Kind	0.45	0.52	0.28	0.05	35
Mark	0.47	0.56	0.39	0.05	23
Nordal	0.44	0.55	0.39	0.05	6
Sundal	0.51	0.53	0.48	0.01	7
Tössbo	0.42	0.46	0.37	0.03	7
Valbo	0.45	0.55	0.35	0.07	9
Vedbo	0.42	0.52	0.25	0.07	14
Vilske	0.43	0.51	0.34	0.05	10
Väne	0.48	0.54	0.42	0.03	7
<b>Total</b>	<b>0.46</b>	<b>0.56</b>	<b>0.25</b>	<b>0.06</b>	<b>156</b>

Sources: Sundquist's excerpts in the War Archives.

The average proportion of children under 15 years of age is 46 per cent. This is a very high proportion when compared to other Swedish historical populations. If correct it indicates a very fast growing population. According to *Tbv* this proportion in 1750 was 33.2%.<sup>20</sup> Also compared to proportions found in some parish studies for the 17<sup>th</sup> century, they seem high: For a parish where catechetical lists give ages for practically the whole population, Grangärde

<sup>17</sup> Lindegren 1980, p. 120.

<sup>18</sup> Friberg 1954, p. 242.

<sup>19</sup> Friberg 1956, p. 8f.

<sup>20</sup> *Statistisk tidskrift* (1903); the number of households 1750 from Linde 2012, p. 1.

in 1677 and 1686, the child proportion was 38.4 and 41.3%, in Mora 1666 34%.<sup>21</sup> Closer to 1630 a uniquely detailed Mill Tax List from 1628, accidentally enumerating children, gives 46% children for Jönköping province's Västra härad.<sup>22</sup> It is obvious that the child proportion might be overestimated in the Älvsborg lists due to false age reporting, however it is unclear to what extent this occurred.

Assuming that practically all households and all their inmates are represented in the lists the following household sizes appear for 156 parishes enumerating children:

**Table 5. Mean Household Sizes in Älvsborg's ransom parish lists ca. 1620.**

Härad	Mean	Maximum	Minimum	Std. Deviation	Number of parishes
Ale	4.62	5.15	4.10	0.32	9
Flundre	4.51	4.73	4.26	0.20	4
Frökind	5.23	6.28	4.74	0.45	7
Gudhem	5.89	6.82	5.17	0.47	18
Kind	4.53	6.10	2.90	0.67	35
Mark	4.29	5.00	2.70	0.50	23
Nordal	4.12	5.38	3.66	0.58	6
Sundal	5.06	5.60	4.49	0.41	7
Tössbo	4.29	5.47	3.75	0.54	7
Valbo	4.42	5.72	3.13	0.80	9
Vedbo	4.28	5.47	3.57	0.57	14
Vilske	4.07	4.54	3.57	0.28	10
Väne	4.61	4.88	4.19	0.24	7
<b>Total</b>	<b>4.63</b>	<b>6.82</b>	<b>3.13</b>	<b>0.75</b>	<b>156</b>

Sources: Sundquist's excerpts in the War Archives.

In 1750 the mean household size for Sweden within today's borders was on average 5.62.<sup>23</sup> As this figure is 120 years younger than the Älvsborg lists however, it doesn't per se disqualify the Älvsborg ransom evidence. The figures in table 5 can also be compared with more contemporary figures. 43 parishes' MHSs estimated from other sources 1613-1699 give the following figures:<sup>24</sup>

<sup>21</sup> Friberg 1956, p.9 and Friberg & Friberg 1976, p. 36). Some other lists are less reliable as they exclude the youngest children (Palm 2000 p. 76 note 62).

<sup>22</sup> Sundquist 1938, p. 180ff. Completed for ages 0/5 years of age not recorded, Sundquist's suggested addition has been accepted.

<sup>23</sup> Linde 2012, p.1.

<sup>24</sup> For sources see Palm 1993, appendix B. Four outliers with very high MHSs have been excluded: Lindegren's for Bygdeå 1621 and 1639 as their age proportions are not contemporary or inferred from other areas. One could also discuss if the fiscal age limits were respected. (Lindegren 1980, p. 114 ff.) The figure 8.4 for Lundby parish 1631, taken from Sundquist, is based on a population figure probably too low (judging from the fairly extreme resulting crude birth rate 45 ‰).

Mean	5.56
Median	5
Standard deviation	0.67
Minimum	4.53
Maximum	7.8

MHS for these 43 parishes seem somewhat higher than those from the Älvsborg lists. However the samples are not random samples from all parishes and hence cannot be seen as representative for all of Sweden, the Älvsborg figures mainly coming from western parts of the country, the 43 mostly from central and northern Sweden. It is clear that MHS varied between regions, northern households are known to have been bigger.<sup>25</sup>

*My method for estimating population from the Älvsborg's ransom material*

My calculations begin with establishing the number of what I call “fiscal households”, in principle, defined according to the same categories that Sundquist used from the original source (Table 1.), servants and children in the lists being excluded. This household definition is a generous one since some of those individuals who were called “lodgers” might have in many cases lived with other people in the same household.<sup>26</sup> The number of households found were then multiplied by MHSs, estimated regionally, from lists that included servants, children and others. Where information on children was missing, MHSs was inferred from adjacent areas.

The calculations result in a total population in Sweden proper in ca. 1620 of about 620,388 people, a number differing only ca. 2 per cent from Sundquist's “preliminary sum”.<sup>27</sup> In order to calculate the population of the Danish and Norwegian provinces conquered by Sweden in 1645, source material similar to the Swedish Mill Tax Lists mentioned above were used. The combined result reveals that the population in the area of today's Sweden numbered 853,871 people in 1620.<sup>28</sup>

Sundquist tried to estimate the population for the year 1630. In order to compare my estimate, I had to extrapolate (by compound interest) my calculations forwards in time in order to reduce the time lapse. This calculation is, however, difficult. These times were very turbulent in many respects. For example, the south-western parts of Sweden in particular were heavily affected by the Kalmar War of 1611–1613.<sup>29</sup> Harvests were bad in 1622–1623 and 1628–1630 in the southern parts of the kingdom. In 1620–1623, as well as in 1629–1630, plague ravaged many parts of the country.<sup>30</sup> The long war with Poland (1600-1629) was intensified from 1621, and in 1630, Sweden intervened in the Thirty Years War. Military conscriptions were increased in 1619. From 1620–1629, Sweden including Finland lost an average of about 3,200 men per year, while in 1630, the loss numbered about 3,600 and from 1631-1639 it was on average about 2,900 a year.<sup>31</sup> Scania, the southernmost province of today's Sweden, was hit by bad harvests in 1628 and 1630.<sup>32</sup>

A linear extrapolation using the estimated populations of 1620 and 1700, indicates that the population in Sweden proper in about 1630 numbered approximately 646,000 people,

---

<sup>25</sup> Cf. Palm 2000, p. 22ff.

<sup>26</sup> Larsson 1972, p. 157ff.

<sup>27</sup> Palm 2000, p. 40.

<sup>28</sup> Palm 2000, p. 198.

<sup>29</sup> Larsson 1972, p. 163.

<sup>30</sup> Larsson, pp. 163-164; Benedictow 2002, p. 262ff.

<sup>31</sup> Cf. Palm 2001, p.142.

<sup>32</sup> Olsen 1942–1944, pp. 467,472.

and within present-day Swedish borders 905,745 people<sup>33</sup>The former figure corresponds to about 70 per cent of Sundquist's 900,000 cited above.

### Conclusion

The Älvsborg second ransom lists give a strong impression of common criteria for characterising different groups in the population. Figures, pointing in similar directions, emerge between areas for sex distribution, proportions of children and MHSs. cursory checks show that tax exempt households as well as poor households, unable to pay, were registered, i.e., not just left out.

Evidence from some local studies using other types of sources from the 17<sup>th</sup> century deviate somewhat from the findings just mentioned, the most striking difference being the very high proportion of children in the ransom lists. It should, however, be stressed that this type of avoidance does not affect calculation of MHSs from the lists.

Taken altogether, the ransom's evidence of a) the number of households and b) MHS for large areas, cannot be easily dismissed. Which are the consequences of this for our main question, the suggested population totals for *Sweden proper* ca. 1630 - the high estimate of some 900,000 inhabitants and the low of 620,000?

The low alternative of 620,000.inhabitants and 121 503 households, estimated from the ransom lists, give a MHS of 5.10 persons. If this MHS is accepted as realistic, the high population estimate of 900,000 would give 176 470 households instead of 121 503. On the other hand, if the number of households in the ransom list is accurate, the high estimate gives a MHS of 7.41. If one is to accept the higher estimate one has to admit that the ransom lists exclude up to a third of all households; thus, if the ransom households are complete, it means that the number of households as well should be some 1/3 bigger than almost all observed MHSs 1750 and before. Of course one could suppose some averages between those two extremes, but especially very high MHSs of over 6 for larger areas do not seem likely.

The study above strongly suggests a population total for *Sweden within the borders of today* ca. 1630 of somewhat above 900,000. At the same time the figures calculated from the ransom lists cannot be taken as indisputably more or less accurate. The accuracy must be checked with other, independent, sources.

### Population estimates from vital records: births, marriages, and deaths, 1630–1760

To estimate the population total of Sweden in 1630 an alternative to using tax lists is to use vital records in the church archives. From those vital data, researchers can retrieve much of the same information as from the later statistics. In Sweden those records get common after the 1680s. For the 1630s they are few, but their number grows successively. Could the extant Swedish church records shed light on the situation around 1630 although initially few? In 1981, in an innovative study, E.A. Wrigley and R.S. Schofield reconstructed England's population history using such data.<sup>34</sup> Judging by how few church records seemed to be needed to get credible calculations of births, marriages and deaths for England, I tried to use the same methods and similar Swedish source material to determine the annual demographic events for the area within Sweden's current geographical borders between the years 1630 and 1760.<sup>35</sup>

Swedish church records were introduced at different times in different dioceses. Some records begin in the early 17<sup>th</sup> century, while others start as late as in the 1680s. This discrepancy prohibited using a pure random sample for the reconstruction. Instead my criterion for an initial sample is if a parish have extant records from at least 1681. In this study, all records surviving from that period onwards were then checked for quality.

---

<sup>33</sup> Palm 2000, p. 40.

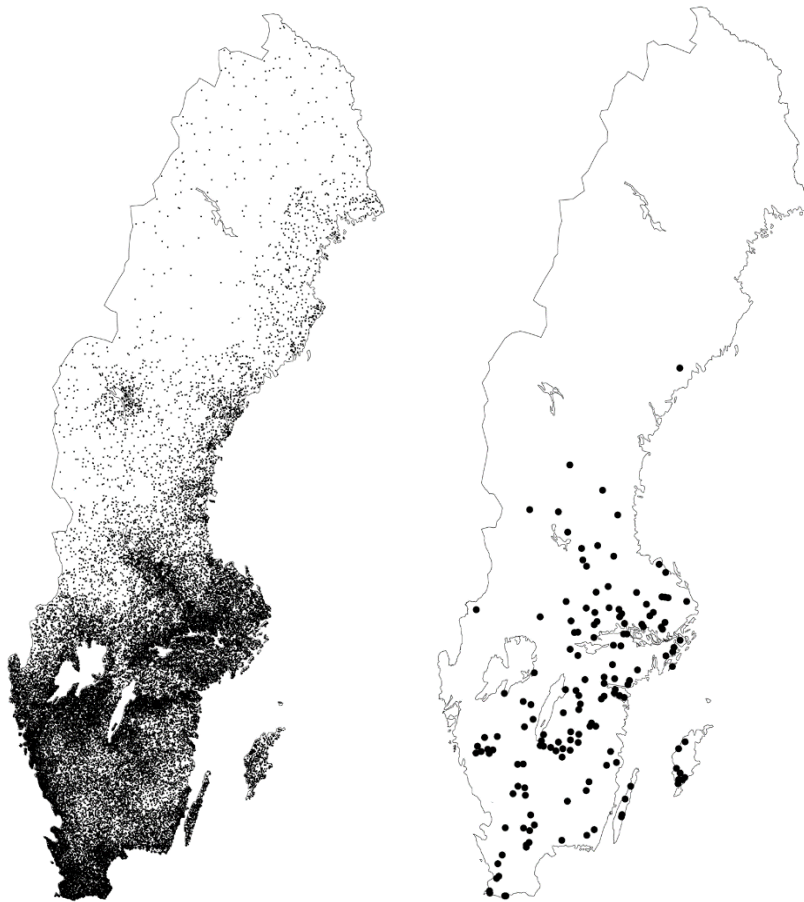
<sup>34</sup> E.A. Wrigley & R.S. Schofield 1989.

<sup>35</sup> Palm 2001. For parishes used, see *ibidem* page 137. Dr. Daniel Larsson assisted in the collection of the data.

Incomplete or illegible records were disqualified. About 150 parishes were included in the sample after this scrutiny.

A comparison between the following maps, one showing the population (the number of households used as proxy) distribution in 1699 and the other the first sample distribution, indicated some regional bias in the sample. Western and southern Sweden seemed under-represented.

**Figure 2. Population distribution in Sweden 1699 (left) and distribution of the sample of parishes with extant church records from 1681 (right).**



Note: The population distribution in 1699, estimate based primarily on households (1 dot = 5 households).  
Source: Palm 2001, p. 119.



A bias also appeared when comparing the sample parishes to the country as a whole for the period 1620–1751:

**Table 6. Average population growth per year in Sweden according to the sample and to estimates for the whole country, 1620–1751 (per cent).**

	ca. 1620–ca. 1699	ca. 1699–1751	ca. 1620–1751
The country	0.54	0.55	0.54
The sample	0.58	0.56	0.57

Note: Population from households and estimated MHSs. Growth calculated from the first and last years of every period.

Source: Palm 2001, p. 119.

Table 6 indicates that the sample parishes grew faster than parishes in general. Differences were also evident when comparing parish size (inhabitants per parish) in 1699 and 1751, based on the sample and the whole country (Table 7).

**Table 7. Parish populations in the sample and in the entire country for 1699 and 1751.**

Parish population	per cent of parishes in the sample		per cent of parishes in the country as a whole	
	1699	1751	1699	1751
0–499	49	32	61	46
500–799	24	26	21	25
800–1,099	14	20	10	14
1,100–1,399	4	9	3	6
1,400 ≤	9	14	4	9
	100	100	100	100

Note: Population in 1699 from households in Mill Tax Lists and estimated MHSs, 1751 from *Tbv*.

Source: Palm 2001, p. 120.

The sample parishes contained more people on average.

To adjust for these regional biases, the reconstruction brought in more parishes, initially discarded, for areas which showed a low representation on the maps. The reconstruction's criteria were widened, records with lacunae for some years were accepted, and others from later years were included. This modification resulted in a new, and final, sample of around 260 parishes.

In order to further account for regional bias, the sample parishes' populations in 1751 were divided according to *län* (= province, there were some 20 of them at the end of the 17<sup>th</sup> century) and compared to the distribution of the population in *läns* for the whole country according to the official statistics, the *Tbv*. The percentile distribution appears in the following table:

**Table 8. Distribution of the population in Sweden and in the sample parishes according to län 1751 (per cent).**

	Population per län 1751	Population in sample parishes	Difference	Correction factor
<i>Län:</i>	a	B	a – b	a/b
Blekinge	2.053	2.609	0.555	0.787
Göteborgs o. Bohus	3.852	2.463	-1.389	1.564
Gotlands	1.375	1.913	0.538	0.719
Gävleborgs	3.156	2.377	-0.779	1.328
Hallands	3.414	2.243	-1.172	1.523
Jönköpings	5.566	5.720	0.154	0.973
Jämtlands	1.217	1.783	0.566	0.683
Kalmar	5.547	6.112	0.566	0.907
Kopparbergs	5.720	8.583	2.864	0.666
Kristianstads	5.126	5.365	0.240	0.955
Kronobergs	3.938	3.204	-0.734	1.229
Malmöhus	5.996	6.926	0.930	0.866
Norrbottnens	1.192	0.792	-0.400	1.505
Skaraborgs	6.572	3.022	-3.550	2.175
Stockholms	4.869	4.607	-0.261	1.057
Södermanlands	4.947	3.031	-1.916	1.632
Upplands	4.124	2.897	-1.227	1.423
Västerbottens	0.916	0.454	-0.462	2.019
Västmanlands	4.165	7.163	2.998	0.581
Västernorrlands	2.115	4.056	1.941	0.521
Värmlands	5.449	4.353	-1.095	1.252
Älvsborgs	6.668	5.164	-1.503	1.291
Östergötlands	7.450	10.711	3.260	0.696
Örebro	4.574	4.449	-0.125	1.028

Sources: For län *Tbv* statistics from *Historical Statistics of Sweden. Part 1. Population. 1720-1967*, for sample parishes from primary parish *Tbv* reports, digitalised by *Demografiska Databasen* in Umeå. For parishes that have lost their primary reports additions have been made mostly using household and MHS (sources used given in table E. in Palm 2000).

The total population distribution in the country in 1751 according to *län*, appears in column (a). The distribution of the populations of the sample parishes for the same year are in column (b). The table shows the regional bias as the percentage difference in column (a-b). The “correction factor” found in the final column will be discussed below.

#### *From samples to totals*

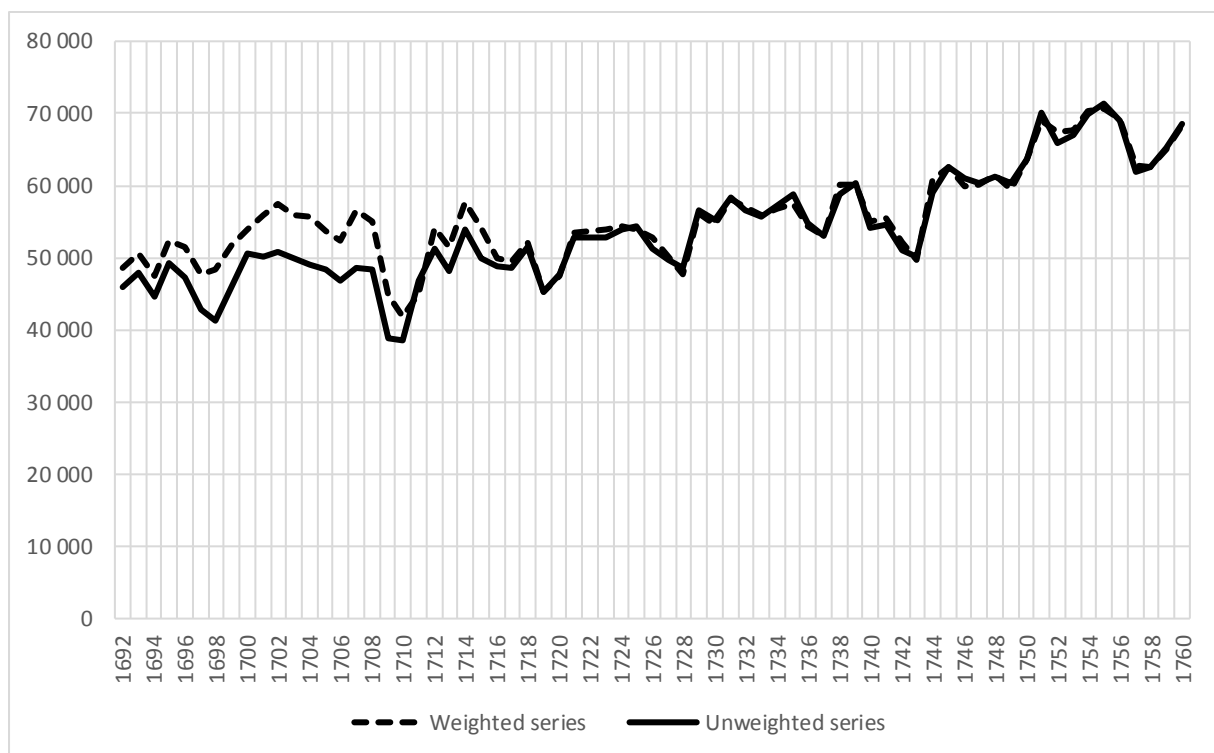
The reconstruction provides a recalculation of the sample’s vital estimates according to the following (hypothetical and very simplified) example, which uses the births found in official parish hypothetical statistics for 1760 as a base (*Tbv* includes parish as well as provincial figures). There were 200 births recorded in the sample from *län Y* in 1760, spread over three parishes. Parish A had 150 births, B 25, and C also 25. Taking the births in year 1760 as a base, the total of two hundred births gives an index of 100. In 1759, the number of births in parish A is unknown (rats ate the relevant pages), but in B and C, 15 and 35 children were born respectively. The index for 1759 was then calculated as  $(15+35)/(25+25)*100$ , which

equals 100. For 1758, there are again records for all three parishes, and A had 90, B 20 and C had 10 births. The index for 1758 then equals 60, calculated as  $(90+20+10)/(150+25+25)*100$ . Again, taking the births in 1760 as the base, the series of births for the *län Y* sample were 200 births in 1760, 200 in 1759  $((100/100)*200)$ , and 120 in 1758  $((60/100)*200)$ . In the whole of the imagined *län Y*, according to the hypothetical provincial *Tbv*, 3,000 births were recorded in 1760. Inflating from the *län* indices makes 3,000 births in 1760, 3,000 in 1759 and just 1,800 in 1758 in the *län*.

All *län* series resulting from the real samples were inflated accordingly and so series of births for all of Sweden could be reconstructed as far back as 1692, the earliest year with parish figures for all *läns*. Marriages and deaths were calculated accordingly.

The final estimates in the study however, had to address the regional biases shown in Table 8. To compensate for these, a correction factor was calculated, as seen in column (a/b). This factor was used for a regional adjustment, inflating the figures from the parishes in under-represented *läns* and deflating figures for the over-represented parishes (see below). The results with and without adjustment for births are shown in the diagram below for the period 1692–1760.

**Figure 3. Estimated number of births in Sweden, 1692–1760.**



Source: From database to Palm 2001.

The unweighted curve is on average 1.1 per cent lower than the weighted, in absolute figures 2.2 per cent with the corresponding medians: 1.4 and +1.9 per cent. Although the curves representing the years ca. 1715–1760 almost overlap, there are fairly large discrepancies for the period 1696–1710.

With regard to the estimates for the period 1630–1691, first, it should be pointed out that the regional bias in the samples for this period might not have been the same as for later. It can be expected that regional bias would be greater before 1692 due to a discrepancy in the availability of source material owing to when church records were introduced. The following

table shows the year from which the first records in the sample survive, per *län*. Only 10 out of 24 *läns* have records reaching as far back as the 1630s.

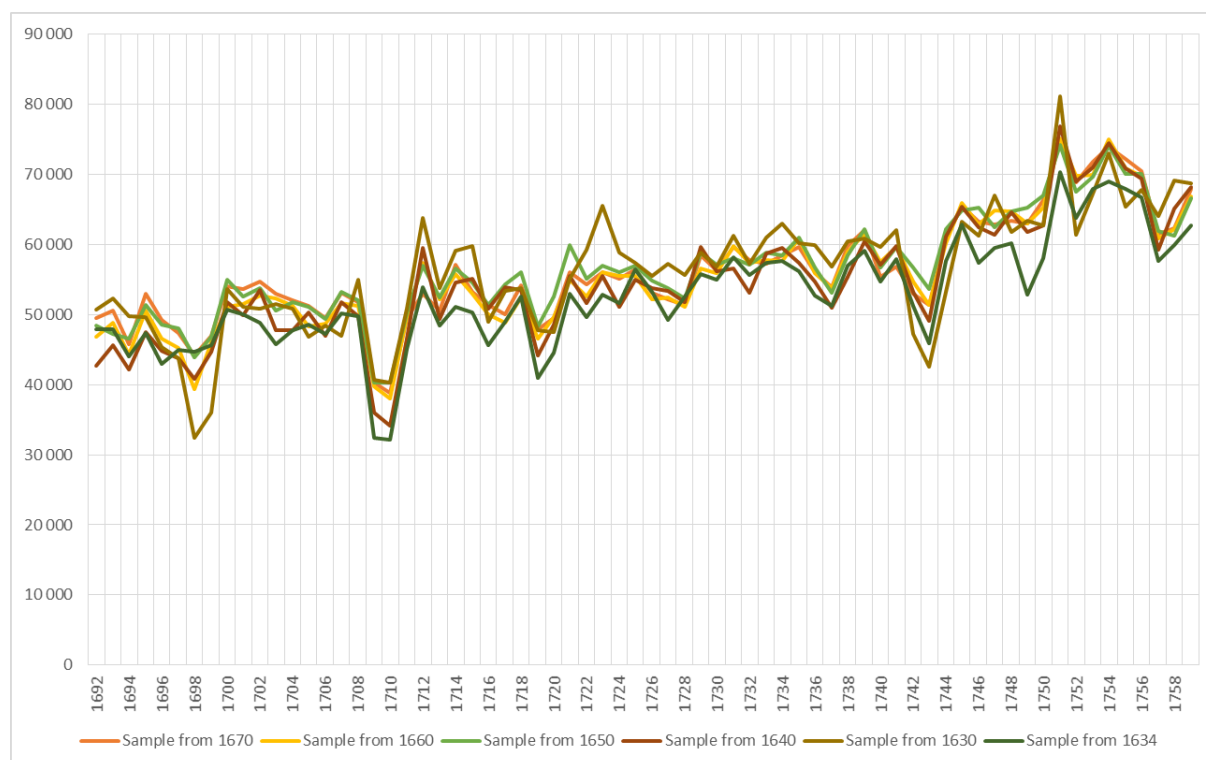
**Table 9. Introduction of church books with vital records.**

<b>Län</b>	<b>First year with useful data</b>
Stockholms	1634-
Uppsala	1661-
Södermanlands	1667-
Östergötlands	1633-
Jönköpings	1633-
Kronobergs	1678-
Kalmar	1633-
Gotlands	1656-
Blekinge	1647-
Malmöhus	1632–1636, 1647-
Kristianstads	1647-
Hallands	1669-
Göteborgs och Bohus	1660-
Älvsborgs	1642-
Skaraborgs	1634-
Värmlands	1657-
Örebro	1633-
Västmanlands	1630-
Kopparbergs	1630-
Gävleborgs	1671-
Västernorrlands	1668-
Jämtlands	1637–1641, 1643-52, 1655–1667, 1681-
Västerbottens	1692-
Norrbottens	1692-

The books mostly provide information for one parish (i.e. *socken*), but sometimes also for groups of parishes (i.e. *pastorat* or *gäll*).

As shown above the number of church records gets fewer and fewer as you move backwards from ca. 1690. Wrigley and Schofield had the same type of problem and suggested a test of the accuracy of their reconstruction: an examination of how it corresponded to, on the one hand, reconstructions of parish samples using surviving records from different periods, and on the other hand, comparing their evidence to a period where all studied parishes had data. I choose to make similar tests of reconstructions for the period 1692–1760 using the data from the different samples from 1630, 1634, 1640, 1650, 1660 and 1670. The following graph displays the results for the number of births (using regionally unweighted values).

**Figure 4. Estimated number of births 1692-1760 according to six samples 1630-1670.**



Source: From database to Palm 2001.

As shown by the graphs, the general trends are almost identical although deviations are evident for certain periods. They did not change much even when applying other corrections.<sup>36</sup>

Using all parishes in the sample the number of births, marriages and deaths in Sweden, starting 1630 have been estimated. The information in the church books on births (entered in the 17<sup>th</sup> century mostly as baptisms) can be accepted as highly accurate although it may contain a slight underestimation due to inconsistent registration of stillbirths with a net rate of maybe 1-2 per cent). My impression is that marriage records are largely complete, as they were of great legal importance. A very big problem, which must be stressed, is that the burial records used exclude many deaths – especially soldiers dead abroad, but probably also civilians in crises situations like in times of plague where burials were hasty and even the bookkeeping priests might have died. The under-registration of deaths might have reached over 10% on average, varying heavily between periods.<sup>37</sup>

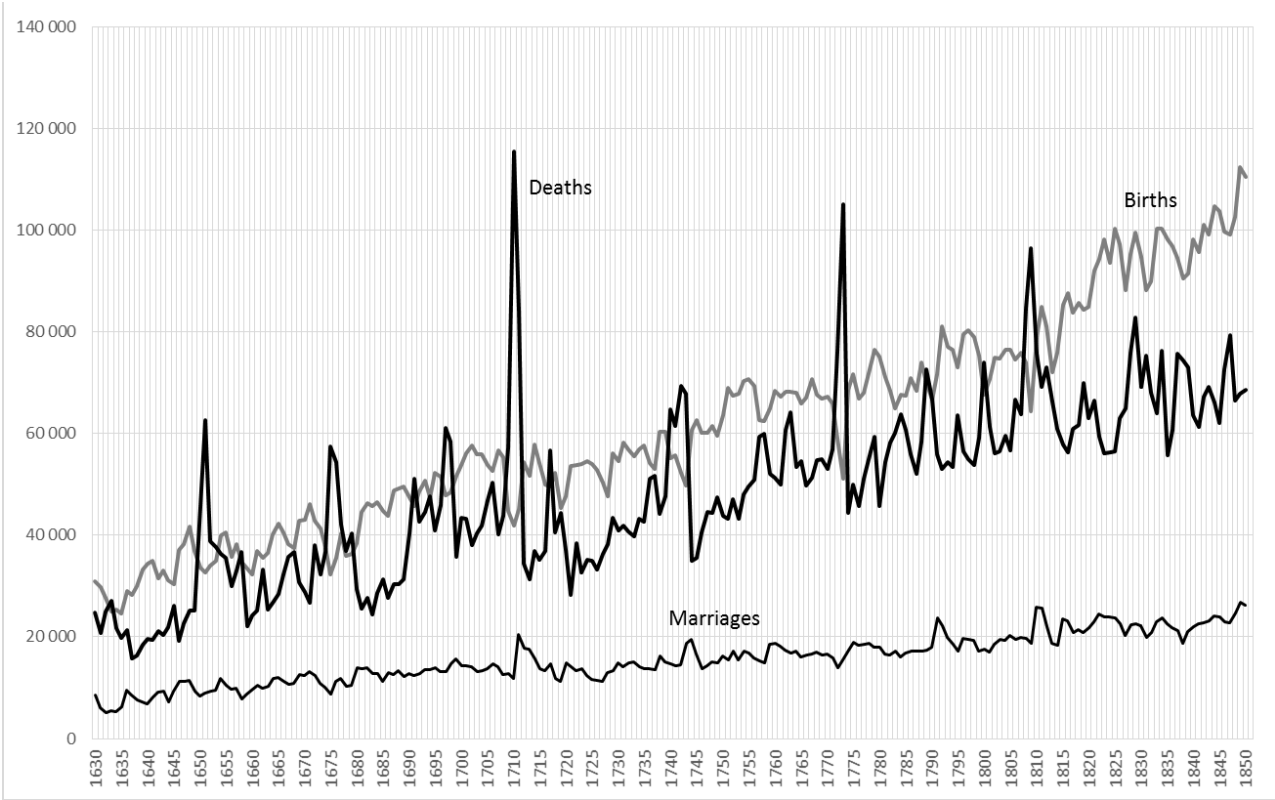
Using the estimates, trying to correct for geographic sample bias, and very tentatively for under-registration of deaths, the figures were used for a reconstruction of

<sup>36</sup> Palm 2001, p. 129ff.

<sup>37</sup> Palm 2001, p. 65f, 334f. For some individual years the figures give crude death rates that are certainly too low. This has been shown in a critical recalculation the by the economic-historian Edvinsson, although he tended to use examples from other periods and places. Edvinsson, suggested that also my calculated numbers of births are too low, but probably to a lesser extent than the number of deaths. This notwithstanding he adds tens of thousands of births per year in the 1630s and 1640s in his recalculation of my series, in fact taken out of thin air and without any support in contemporary source material (Edvinsson 2015, p. 173, tables 3 and 4; cf. Palm 2001, p. 63ff, 115ff).

population totals, starting from a point in time where the population was known, successively going backwards, adding deaths and subtracting births. The following graphic emerged:

**Figure 5. Births, deaths and marriages 1630-1650 in Sweden (borders of today).**



Source: Palm 2001, p. 65f.

In table 10 the average results for vital crude rates can be summarized.

**Table 10. Estimated crude vital rates in Sweden 1630-1700.**

Period	Crude Birth Rate	Crude Marriage Rate	Crude Death Rate
1630-1639	30.27	7.43	22.6
1640-1649	33.32	8.87	21.05
1650-1659	33.37	8.84	35.35
1660-1669	33.69	9.63	26.26
1670-1679	32.77	9.32	33.05
1680-1689	36.31	10.3	22.73
1690-1699	36.27	9.99	34.59

As the reconstruction to a large extent depends on, as already mentioned, unreliable death figures, here a more impeccable method will be used – estimating population totals from estimated births. Crude birth rates (CBR) in the pre-industrial society are fairly well known to limits and, much more stable than the crude death rate (CDR). The marriage rate (CMR) is less well known and probably to some extent correlated to CDR, mortal crisis often being

followed by a rise in marriages.<sup>38</sup>

In Western Europe the CBR usually varied between 35 and 40‰ in the 17<sup>th</sup> and 18<sup>th</sup> centuries.<sup>39</sup> The results from some local Swedish investigations with good demographic sources fit very well into this interval<sup>40</sup>:

*Skärkind, Gårdeby and Gistad* parishes in Östergötland 1677-1700 on average ca. 30‰.<sup>41</sup>

*Björskog* parish in Västmanland the first half of the 17th century 32‰; 1628 30‰.<sup>42</sup>

The province of *Närke* 1690-1700 33.36‰.<sup>43</sup>

*När* and *Lau* parishes in Gotland 1697 31.5.<sup>44</sup>

*Grangärde* parish in Dalarna 1645-1669 31.5.<sup>45</sup>

From later periods the *Tbv* gives the following crude births rates for Sweden in its area of today found for all of Sweden<sup>46</sup>:

1721-1750	32.9
1751-1800	33.6
1801-1850	32.2

Nils and Inga Friberg concluded that CBRs were about as high in the 17<sup>th</sup> as in the 18<sup>th</sup> century.<sup>47</sup>

In the following Figure 6, population figures have been estimated from the number of births taken from my reconstruction. The births rates are assumed to have varied between 30 and 40‰; higher rates seem to have been rare in Sweden, at least for larger areas and longer period (the higher CBRs that are assumed, the smaller the size of the population they indicate.

---

<sup>38</sup> Nils Friberg 1956, p. 402ff.

<sup>39</sup> Henry 1967, p. 53.

<sup>40</sup> Estimated CBRs for Scania 1650-1700 by Bengtsson & Oeppen (1993, p. 20) of over 40‰ has been left out here as the base population estimate is established in an unclear way. The mill tax records used demand much more of a discussion than the authors present. Probably Scania had much in common socio-demographically with Denmark where CBRs seem to have varied between 30.8 and 36.6‰ (average 33.4) 1665-1704. Cf. Johansen 2002, p. 44.

<sup>41</sup> Friberg & Friberg 1964, estimated from diagram p.25.

<sup>42</sup> Friberg & Friberg 1976, p. 31. CMR p. 30 = 8‰.

<sup>43</sup> Five years 1690-1700 (Hannerberg 1941, p. 91); CMR = 9,6‰ 1691/1700 (p. 95)

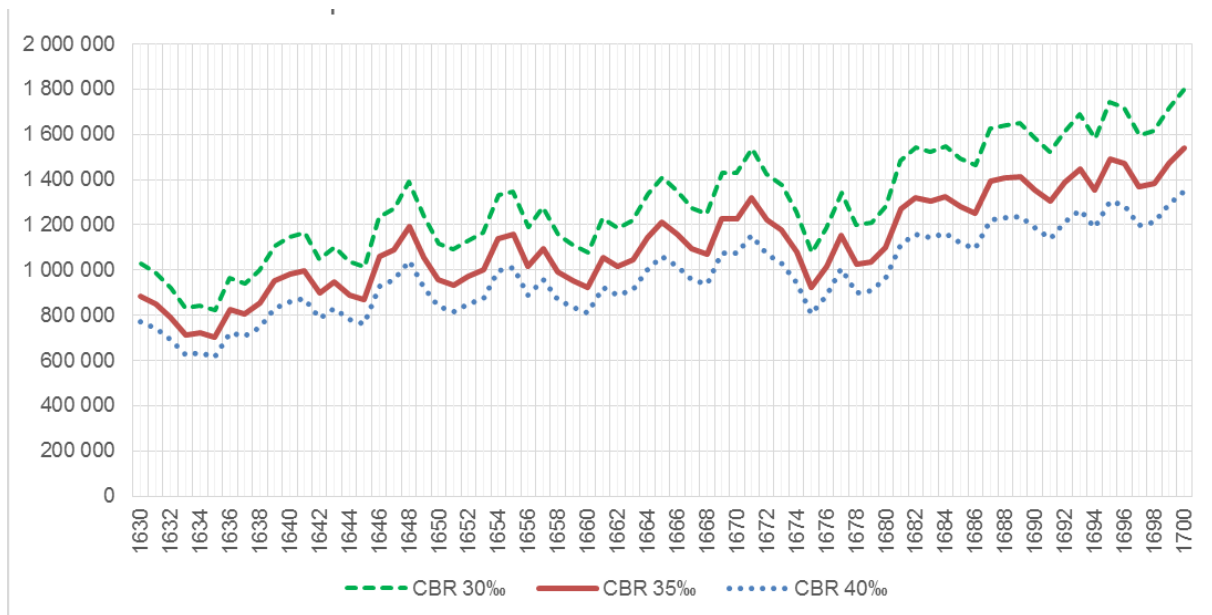
<sup>44</sup> Åkerman 1986, p. 49; CMR = 13.4‰.

<sup>45</sup> Friberg 1956, p. 401. CMR = 7.5‰.

<sup>46</sup> Hofsten & Lundström 1976, p. 16. CMRs were 8.6, 8.5, 7.9 and CDRs 25.8, 27.4 and 23.9‰ respectively.

<sup>47</sup> Friberg & Friberg 1978, p. 18.

**Figure 6. Population of Sweden 1630-1700 estimated from Crude Birth Rates.**



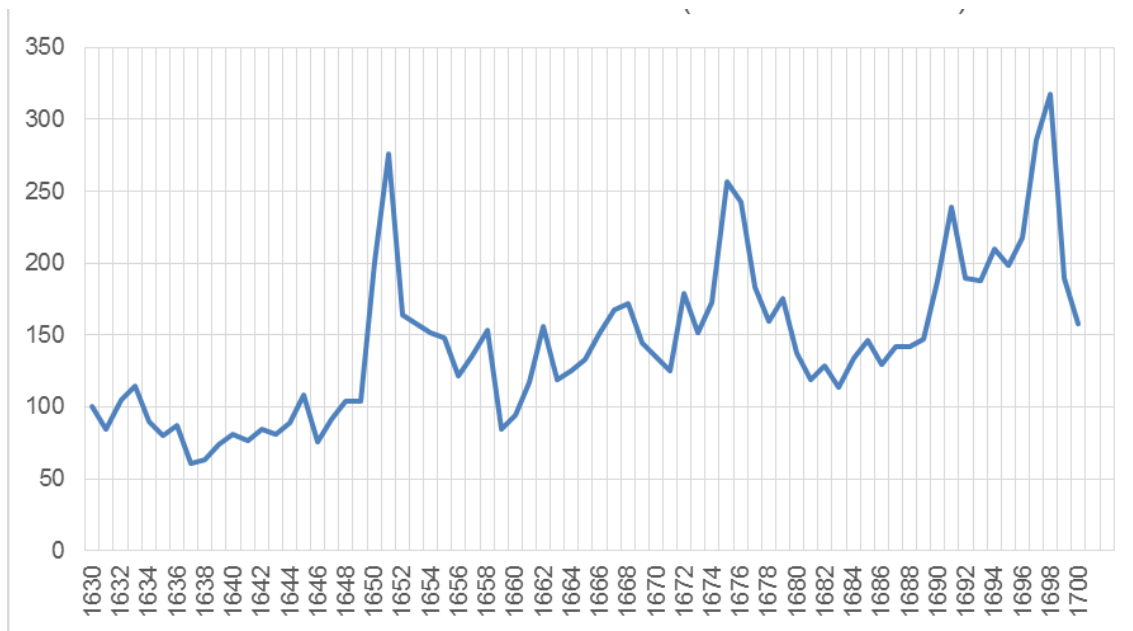
Note: Sweden within borders of today.  
Source: Births from palm 2001, p. 65.

Whichever figure for CBR you choose the population estimates show a clear rising trend and the population around 1630 seems to have reached somewhat more than 900,000 people when the probably fairly realistic CBR of 35‰ is chosen.

Deaths, especially in periods of very high mortality – not least from epidemics or famines hitting children or elderly hardest - press population numbers downwards. With all its shortcomings it still seems worthwhile to check the evidence from the more problematic reconstruction of the deaths figures. In the following graph non-adjusted death estimates are given as an index (1630=100):



**Figure 7. Deaths in Sweden 1630-1700 (index 1630=100).**

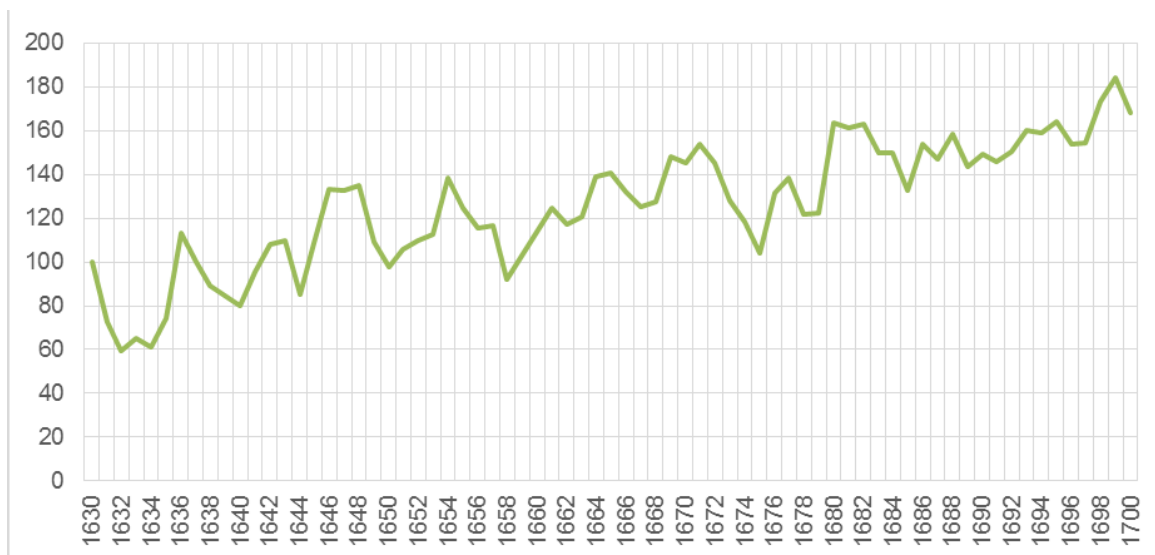


Note: Figures not corrected for under-registration. Sweden within borders of today.  
Source: Palm 2001, p. 141f.

As with births a growing number of burials over time indicate a rising population. The trend in figure 7 is about the same as in figure 6. However it should be kept in mind that the importance of under-registration of burials might have varied over time, not least during the spikes from plagues and famines in the 1650s, 1670s and 1690s, distorting the graph to an unknown extent.

In figure 8 estimates of the number of marriages are shown, also as an index. As with the foregoing graphs they indicate a strong positive trend 1630-1700. From more marriages logically follows a growing population.

**Figure 8. Marriages in Sweden 1630-1700 (index 1630=100).**



Note: Sweden within the borders of today.  
Source: Palm 2001, p. 65f.

## Conclusion

All estimates from vital records, of births, marriages and deaths show marked positive trends. The population estimated from a probably realistic average CBR, 35‰, totals some 900,000 in ca. 1630. This figure, as well as the trend 1630-1700 that follows, deviate much from the dominating population estimates, up to more than a third higher. However the lower figure very well agrees with my estimate from households described above.

Taking my figure from the households and the higher estimates by other researchers as base the following crude vital rates emerge (Table 11). In order to illustrate the resulting differences, data from later periods with largely accepted figures have been included.

**Table 11. Crude birth, marriage and death rates in Sweden based on different population estimates (‰).**

Year	Population	CBR	CMR	CDR	Source
ca. 1630	905,745	32.4	7.5	19.0	This article.
ca. 1630	1,129,720– 1,181,589	26.0– 24.8	6.0-5.7	15.5- 14.8	Heckscher 1935-36, Edvinsson 2015, based on Sundquist 1938, pp. 263, 279.
ca. 1630	1,094,653– 1,157,522	26.8– 25.4	6.2-5.8	16.0- 15.2	Hofsten 1976, p. 13, based on Widén 1976 and an assumed average growth rate of 2.4–3.2‰.
ca. 1630	1,179,720– 1,231,589	24.9– 23.8	5.7-5.5	14.9- 14.3	Lindegren 2001, p. 172.
1700	1,369,000	38.7	10.5	29.1	Widén 1976, p. 172.
1750	1,780,678	36.2	9.2	26.74	<i>Historical Statistics of Sweden. Part 1. Population. 1720-1967.</i> Tables 2 and 28.
1810	2,396,351	32.9	11.6	31.6	<i>Historical Statistics of Sweden. Part 1. Population. 1720-1967.</i> Tables 2 and 28.

Compared with my population figure for 1630 (905,745), mainly based on Älvsborg's second ransom lists, the reconstructed number of births, from vital records, gives a very plausible crude birth rate of 32.4‰. The higher population estimates for 1630 give extremely low birth rates, practically unknown for Early Modern Europe. Not much is known about CMRs before the 18<sup>th</sup> century due to the problematic sources. However, it is obvious that the CDRs from all the different estimates ca. 1630 are much too low and unrealistic, more so for the higher population estimates.

The evidence provided by the two independent sources - households from the Älvsborg ransom lists and vital records from church archives, very much agree. When compared to the generally accepted population figure of about 1,300,000 people in 1700, the lower figure gives an average growth of ca. 7‰ per annum for Sweden proper in about 1630 and of ca. 5.6‰ for Sweden within its current borders.

## Nutritional limits for population growth

My two estimates above point in the same direction – a population total in ca. 1630 of somewhat above 900,000 and a plausible average CBR of somewhat below 35‰. As a fast growing population requires more food a recent research project on agrarian production gives a third opportunity to estimate probable population totals from sources, totally independent of both personal tax lists and vital records from the church archives.

In a separate research project I tried to estimate cereal and animal production for two periods, 1630 and 1690 (Palm 2012a, 2012b). I used generally accepted methods on different sources such as land survey protocols, cattle tax registers and tithing records. Additions were

made for categories of farms left out in the tax and tithing lists inflating their figures with the help of cadastral information (the latter giving tax assessments for most farms, “jordeboksmantal”). Here is not the place to go into detail, but extensive discussions are included in the published project reports.<sup>48</sup> The estimates are presented in the following table:

**Table 12. Estimated arable and average harvests in Sweden in borders of today ca. 1630 and 1690.**

	<b>Ca. 1630</b>	<b>Ca. 1690</b>
Total arable in “tunnland”	1,178,665	1,371,717
Arable sown in “tunnland”	738,874	812,605
Seed corn as barrels of “pure grain”	738,874	812,263
Harvest of wheat in barrels	12,571	23,813
Harvest of rye in barrels	630,826	862,547
Harvest of barley in barrels	996,647	1,138,135
Harvest of mixtures, mainly rye and barley in barrels	16,486	164,631
Harvest of oats in barrels	130,890	222,331
<b>Harvests as barrels of “pure grain”.</b>	<b>1,720,519</b>	<b>2,242,619</b>

Note: 1 “tunnland” = 4.936.6 square meters = 1.21982 acres; “pure grain” was a bookkeeping routine, where all sorts of cereals were reduced according to their standard prices in relation to rye, so 1 volume of barley = 1 volume of rye = 2 volumes of oats etc. All barrels standardized to the barrel volume introduced in 1665, 165 litres. 1 barrel of “pure grain” were often sown on 1 “tunnland”.

Sources: Palm 2012a, p. 5; 2012b, p. 1.

**Table 13. Estimated livestock in Sweden in borders of today ca. 1630 and 1690.**

	<b>Ca. 1630</b>	<b>Ca. 1690</b>
Adult horses	259,268	298,904
Young horses	48,550	67,031
Oxen (and bulls)	160,118	200,443
Steers	241,277	267,856
Cows	732,051	842,184
Heifers	319,287	322,949
Calves	284,835	296,897
Sheep	814,455	1,081,378
Lamb	601,303	617,154
Goats	321,664	357,878
Goat kids	327,800	278,141
Old pigs	291,491	368,990
Young pigs	342,961	422,255
<b>Livestock units</b>	<b>1,936,618</b>	<b>2,255,244</b>

Note: The livestock unit is a reference unit which facilitates the aggregation of livestock from various species and age, in Sweden in the 17<sup>th</sup> century according to relative values in relation to a cow.

Sources (Palm 2012a, p. 6; 2012b, p. 2).

<sup>48</sup> Palm 2012a, 2012b. Rodney Edvinsson (2015, p. 181) maintains my estimates of seeds tend to underestimate real volumes, however without any concrete reference to sources. My seed statistics is mainly based on land survey protocols made by professional surveyors. Their accuracy has been praised by all leading Swedish scholars of agrarian history. The “seed corn” in the cattle tax lists from the beginning of the 17<sup>th</sup> century, however, is generally not a useful estimator (and I did not use it for my statistics).

How many people could be fed by these levels of production? To try to answer this question one has to convert the figures in the last two tables to some nutritional quantity. A common popular measurement in this regard is energy, (kilo-)calories. (Of course there are other nutritional variables, viz., protein, vitamin and mineral contents and so on). The economic historian Carl-Johan Gadd has shown that 1 barrel of “pure grain” had an energy content of on average 330,000 calories.<sup>49</sup> The agrarian historian and cultural geographer David Hannerberg made penetrating studies from successive detailed accounts of peasant cattle stocks where he could estimate the possible number per different livestock animals that could be taken out for slaughter. From earlier research by Hans Forssell he knew the average weight of contemporary oxen, sheep etc. The historian Jan Lindegren made similar studies that corroborated Hannerberg’s finding.<sup>50</sup> In a stable cattle population a livestock unit gave 17.43 kg. of meat to be taken out from slaughter on average per year, or recounted to energy 2,400 calories. Other studies gave new knowledge to milk production levels in the 16<sup>th</sup> and 17<sup>th</sup> centuries. A cow left after what was needed for her calf about 550 litres, giving 500 calories per litre, taking into account its fat content at the time. The milk production per sheep or goat could be estimated to about one tenth of that from a cow. This allows us to estimate the energy content of the Swedish agrarian production around 1630 and 1690. The results are shown below.

**Table 14. Estimated agricultural energy production in Sweden in borders of today ca. 1630.**

Ca. 981,645 barrels of “pure grain” * 330,000 calories.	323,942,850,000
Slaughter meat from 1,936,618 livestock units * 17.43 kg. * 2,400 calories.	81,012,604,176
Milk from 732,051 cows * 550 litres * 500 calories.	201,314,025,000
Milk from 814,455 sheep * 55 litres * 500 calories	22,397,512,500
Milk from 321,664 goats * 55 litres * 500 calories.	8,845,760,000
<b>Total production of calories.</b>	<b>637,512,751,676</b>

Note: to arrive at the 981,645 barrels of grain in the table I have deducted corn seed from harvest figures in table 12. For “pure grain” and livestock units see tables 12 and 13.

**Table 15. Estimated agricultural energy production in Sweden in borders of today ca. 1690.**

Ca. 1,430,000 barrels of “pure grain” * 330,000 calories.	471,904,620,000
Slaughter meat from 2,255,244 livestock units * 17,43 kg. * 2,400 calories.	94,341,367,008
Milk from 842,184 cows * 550 litres * 500 calories.	231,600,600,000
Milk from 1,081,378 sheep * 55 litres * 500 calories.	29,737,895,000
Milk from 357,878 goats * 55 litres * 500 calories.	9,841,645,000
<b>Totalt production of calories.</b>	<b>837,426,127,008</b>

Note: to arrive at the 1,430,000 barrels of grain in the table I have deducted corn seed from harvest figures in table 12. For “pure grain” and livestock units see tables 12 and 13.

In these calculations vegetables, fish and small game are not included. This notwithstanding the calorie production in the tables without doubt cover the brunt of the energy produced. How many people could this feed? To answer that question we have to answer the human caloric needs of the time. Several studies have dealt with that question. The economic-

<sup>49</sup> Gadd 1983, p. 135.

<sup>50</sup> Hannerberg 1971 p. 107; Lindegren 1980, Ch. 6.2.

historian Mats Morell studied Swedish hospitals in the 17<sup>th</sup> century. The inmates 1659-1710 were given 2,000-2,200 calories on average a day. In Västerås in the 1620s patients could consume ca. 2,500, 1635-1674, i.e., on average 1,900-2,000 calories; 1687-1703 the energy intake varied between 1,600 and 2,200.<sup>51</sup> The inmates however were probably relatively weak people, old or sick or both. In Stockholm the staff of the orphanage, probably adult and healthy people, were better fed, at least in 1674 and 1686 when they consumed 3,700 and 3,800 calories a day, respectively<sup>52</sup> But it is not clear that Stockholm was typical for the countryside at large.

For the countryside David Hannerberg estimated, – he studied Närke province in central Sweden – that common peasant farms in decent years in the 1690s could consume some 3,000 calories per day and per person after taxes and tithes were paid.<sup>53</sup> This is the same figure as has been estimated as needed to sustain a manual labourer in the preindustrial society.<sup>54</sup> For a period closer to 1630 Jan Lindegren has calculated a daily per capita energy consumption in a northern Swedish parish of slightly more than 2,200 calories.<sup>55</sup> So, how many people could be fed by the energy available according to tables 14 and 15 above? The following possible populations emerge from different energy consumption alternatives:

**Table 16. Population totals from alternative estimated needs (Sweden in borders of today).**

Calories per normal consumer per day	Ca. 1630		Ca. 1690	
	Normal consumers	Population total	Normal consumers	Population total
1,000	1,746,600	2,183,263	2,294,318	2,867,898
1,500	1,164,409	1,455,509	1,529,545	1,911,932
2,000	873,305	1,091,631	1,147,159	1,433,949
2,500	698,644	873,305	917,727	1,147,159

Note: “Normal consumers” = total population \* 0.8.

The energy estimates in tables 14 and 15 show a strong positive trend ca. 1630-1690, consumption rising by about 50%. In fact, the rise was still higher. Starting in ca. 1650, net cereal imports, primarily from Riga and the Baltic region became more and more important.<sup>56</sup> In 1685, these amounted to about 201,000 barrels, in 1696 about 800,000, and in 1697 about 600,000 barrels.<sup>57</sup> Taking these figures into account, for part of the 1690s, Sweden proper received between 500,000 and 1,000,000 barrels from Scania and the Baltic. With an energy content of 330,000 calories per barrel and a minimum energy need of 2,500 calories for a

<sup>51</sup> Morell 1987, pp. 255, 259

<sup>52</sup> Utterström 1978, p. 154.

<sup>53</sup> Hannerberg 1971, p. 113,

<sup>54</sup> Hannerberg 1971, p. 116; this figure has been accepted by among others by Carl-Johan Gadd (1983, p. 141.) society.

<sup>55</sup> Lindegren 1980, p. 246. The base population somewhat disputable.

<sup>56</sup> Myrdal 2011, p. 107.

<sup>57</sup> Boëthius & Heckscher 1938; Axelsson 1888, p. 6. Marten Seppel discusses these figures and estimates a grain export from the Baltic provinces 1695-1697 of more than 1.1 million barrels (2015 p. 230). Most of this must have gone to Sweden as the Baltic countries were not allowed to export grain to other areas than Sweden-Finland 1696 and 1697 (p. 220). Recently arguing against a fast population growth during the 17<sup>th</sup> century, Rodney Edvinsson overlooks that Sweden turned from a net exporter of cereals to a big net importer in the middle of the 17<sup>th</sup> century. He assumes that the net sum only accounted for about five per cent of the total harvest referring to imports of the 18<sup>th</sup> century (Edvinsson 2015, p. 181).

normal consumer, these imports indicate that enough food for 230,000 – 450,000 people of all ages was imported! In the first half of the 18<sup>th</sup> century (1718–1750), net imports numbered on average 350,000 barrels, reaching a maximum of 690,000 in 1743.<sup>58</sup>

With the annexation of Scania in 1658 Sweden brought another source of grain for Sweden proper, grain not included in the import figures just mentioned. In its Danish period the province had exported much of its grain surplus to Norway, a country with weak cereal production possibilities.<sup>59</sup> After 1658, however, this surplus was redirected to Sweden proper.<sup>60</sup> According to information from 1697, Scania could export up to 200,000 barrels a year.<sup>61</sup>

## **Conclusion**

Calculating the energy consumption levels 1630 and 1690 gives a strong impression of growing energy production and consumption in Sweden. How many people could be sustained according to those estimates?

If the consumption level about 1630 was similar to Hannerberg's consumption estimate for Närke for the 1690s – 3,000 calorie/day/pers. - the calculations above give a very low sustainable population of only some 650,000 people in Sweden 1630. As shown above the 1630s were very difficult years in the country, and an average consumption of less calories should be expected. If we assume an intake of 2,500 calories the population might have numbered some 870,000 people; likewise 2,000 calories indicates about 1,100,100 inhabitants in Sweden in its area of today. A population estimated from households and MHSs and from vital records of some 900,000, would demand an energy consumption level of around 2,400 calories per a grown up person, a figure that seems plausible for the time judging from several studies. It is, however, obvious that the higher population estimates traditionally dominating demographic descriptions of Sweden around 1630 – between 1,100,000 and 1,232,000 people – are not compatible with any known levels of energy consumption from the 17<sup>th</sup> century. There is no way people could have survived on as little as 1,500 calories or so per normal consumer.

## **Some arguments for a large population in 1630 and weak growth from ca. 1630–1700 scrutinized**

The arguments for the higher population estimates for ca. 1630 have varied. Sundquist himself used proportions and rates from the official statistics from the 1770s as arguments against his preliminary calculations. In the 1930s, the economic historian Eli F. Heckscher accepted Sundquist's results, albeit hesitantly. He wrote, "Sundquist seems to only take into account factors that lead to an increase of the figures without giving corresponding attention to factors that point in the opposite direction".<sup>62</sup> Not many new concrete arguments have been put forward by later supporters of Sundquist's estimate until the economic historian Rodney Edvinsson challenged lower estimates (Edvinsson 2015).

### *Taxation lists not complete?*

Edvinsson maintains that tax lists exclude not only children, but also many other people. He compares my regional estimates from households and MHSs with people enumerated in Mill Tax Lists from 1628. The social and economic geographers Nils and Inga Friberg found that such lists for one parish, Björskog, about which much is known, enumerated only 37.2 per

---

<sup>58</sup> Åmark 1915, table 1; *Historical statistics of Sweden. Part 3. Foreign trade 1732-1970*, table 1.1, 1.4.

<sup>59</sup> Friis 1942, p. 542ff.

<sup>60</sup> Bjurling 1945, p. 111f.

<sup>61</sup> Axelson 1888, p. 9f.

<sup>62</sup> Heckscher 1935, p. 30.

cent of the total population (including children), and called this discrepancy the “nominal taxation percentage”.<sup>63</sup> Edvinsson calculated that the enumerated payers in the Mill Tax Lists corresponded to 53 per cent of my estimated population for 1630, for some provinces around 60 per cent, and regionally for Södermanland and Uppland counties even 70 per cent. This high percentage, according to Edvinsson, indicates that my population estimate is too low.

However the “nominal percentages” varied greatly in Björskog: for 1672, they were 45 per cent, for 1636 they were 50 per cent, and for 1672 only about 28 per cent.<sup>64</sup> Moreover, Björskog was only one of ca. 1,660 parishes in Sweden proper at that time (compared to about 2,400 parishes within the borders of modern-day Sweden). Estimates for the province of Närke indicate a “nominal percentage” of ca. 53 per cent for 1628.<sup>65</sup>

Most importantly, however, I did not use the Mill Tax records, but focused instead on the records from the Älvsborg ransom tax, its collection as shown above rigorously controlled by procedures unknown for any other personal tax in the 17<sup>th</sup> century, for large areas even, contrary to ordinary mill tax lists, including even the smallest children.<sup>66</sup>

### *Evidence from international comparisons*

Edvinsson points to the fact that a low estimate of some 900,000 inhabitants within Sweden’s borders of today in 1630 indicates a fast rate of growth of almost 6‰ per annum for the period 1630–1700. This growth rate, according to Edvinsson, deviates from developments in the rest of Europe and the Nordic countries, again indicating the underlying calculations must be wrong. While he claims that it follows from the lower estimate that the population of Sweden has doubled, that of England and the Netherlands, also comparatively fast-growing, only increased by 1/3 in the 17<sup>th</sup> century. The only exception was Ireland, which expanded at a similar rate to that which he claims that I suggested.<sup>67</sup>

However, Edvinsson overlooks the fact that population growths varied enormously during the period. In England, the average annual increase was as high as 5‰ from 1600–1650, in Holland 1575-1622 11.1‰ and 1622-1680 4.7‰.<sup>68</sup> In Norway, the population increased by 7-9‰ on average from 1520–1664, and from 1660–1701 by 4‰.<sup>69</sup> In Norway’s Romerike, the population grew by 70 per cent 1612–1665, and in Østlandet, the growth rate per annum reached 7‰ between about 1650 and 1750.<sup>70</sup> The population of Tavastia in Finland grew from about 42,500 in 1634 to 65,000 in 1694<sup>71</sup>, and Ostrobothnia’s grew from approximately 25,000 in 1654 to 42,000 in 1694 before great losses occurred in the famine years of 1695-97.<sup>72</sup> This means that the average growth rate in Tavastia was 7.1‰ in that

---

<sup>63</sup> Friberg & Friberg 1976, figure 3. The population estimate uses a comprehensive list of the population from 1643 and goes backwards using church vital records. It is unfortunate that population listings such as the unique one from Björskog were mostly not introduced until the 18<sup>th</sup> century.

<sup>64</sup> Friberg & Friberg 1976.

<sup>65</sup> Hannerberg 1941, p 81 ff. There are problems with the Mill Tax Lists for Västmanland, the province where Björskog is situated, as they tend to enumerate people according to *cadastral units*, not households (Palm 2000, p. 350). For Björskog you get about 10.5 persons per tax list unit, but 7.2 estimated from the catechetical list. Friberg & Friberg’s criticism (1976) against Hannerberg (p. 57) must be taken with this fact in mind. Edvinsson 2015, note 4, quotes my calculations for Värmdö skeppslag (hundred) as too low, but fails to observe that that *skeppslag* (~*härad*) according to the administrative division I used exclude two parishes (Boo and Ljusterö) that in periods adhered to the skeppslag. He also fails to mention that Friberg & Friberg excludes this criticism in the second edition of their report 1976.

<sup>66</sup> For Finland, the Älvsborg ransom lists are difficult to use as certain local terms in them are hard to interpret (Jutikkala 1957, p.155f.).

<sup>67</sup> Edvinsson 2008, p. 17; 2015 p. 171.

<sup>68</sup> van Zanden 1993, table 2.1.

<sup>69</sup> Dyrvik 1990, pp. 18-19.

<sup>70</sup> Holmsen 1994, pp. 417-418; Sogner 1996, p. 169.

<sup>71</sup> Jutikkala 1957 pp. 155-172

<sup>72</sup> Virrankoski 1973, pp. 98-105.

period, and in Ostrobothnia it was an astonishing 13.1‰! These figures strongly contradict Edvinsson's generalisations based on his sparse and disparate material.

### *National comparisons*

According to Edvinsson, calculations that give a much lower growth rate for the Danish-Norwegian provinces conquered in 1645 and 1658 show that a very high rate for Sweden proper must be wrong.<sup>73</sup> However, growth rates varied immensely within Sweden of today's borders. For example, the counties of Jämtland and Härjedalen had a very slow average long-term development in the 16<sup>th</sup> and 17<sup>th</sup> centuries; in the beginning of the century, the Kalmar War was followed by a revenge campaign from the Danish king, which led to a population dip in about 1620 and a later increase in development towards the end of the century.<sup>74</sup>

With regard to Scania, Halland and Blekinge, the former was the demographically most important. Its geography, social, economic and agrarian structure, differed greatly from that of Sweden proper. In important aspects, Scania was comparable to the Danish islands, especially Zealand. Scania's 17<sup>th</sup> century can be described as catastrophic. The province was a theatre of war on several occasions, and in the war in the 1670s, tens of thousands of its inhabitants migrated to the Danish islands.<sup>75</sup> Demographically it followed a similar development as Denmark, the latter with a growth rate of only 2.2‰ from 1645-1769. The fact that Denmark (and Scania) underwent several severe crises in the 17<sup>th</sup> century even indicates that the average for the 17<sup>th</sup> century was lower than 2.2‰.<sup>76</sup>

One source that can shed some light on population size in the second half of the seventeenth century is the size of the age groups born in the period who were still living when the first *Tbv* age distributions were constructed in the middle of the 18<sup>th</sup> century. Oscar Bjurling compared the age groups 75/80 in the *Tbv* for 1750-1796 for Scanians born 1671-1720 and for Sweden in general. The cohorts for Scania for the earliest periods were over 30% lower; only for the period 1691-1695 did Scania have more births than the rest of Sweden).<sup>77</sup> This corroborates the conclusion that there was a weak demography in Scania.

The contrasts between Scania and other parts of Sweden proper are evident. For instance, the parish of Grangärde in Dalarna, with excellent source material, had a growth rate of no less than 16.3‰ from 1650–1700, which was higher even than in Ostrobothnia mentioned above).<sup>78</sup>

### *Contradictory economic data?*

Finally, Edvinsson describes what he considers to be a rise in real wages in Stockholm over time to be incompatible with strong Swedish population growth: “an anomaly in an economy perceived as possessing distinctive Malthusian characteristics”.<sup>79</sup> However, judging by the statistical series compiled by Johan Söderberg (2010) showing real wages for daily labourers in Stockholm, there does not seem to have been any significant increase in real wages, at least not for the period 1630–1750, according to the graph below. Moreover, the representativeness of this Stockholm series for consumption levels among the overwhelming majority of the population can no doubt be questioned; it may not reflect conditions in the countryside. Nevertheless, it is interesting in this context to compare the real wages from Stockholm with the harvest dependent tithes collected from the area around the city, the province of Uppland

---

<sup>73</sup> Edvinsson 2015, p. 171.

<sup>74</sup> Cf. my discussion about Salvesen's (1978, 1979) findings in Palm (2000, p. 265).

<sup>75</sup> Bjurling 1945, p. 96 ff, 156 ff.; Fabricius 1952, p. 223f.

<sup>76</sup> Palm's calculation for 1645 from Petersen (1980, pp. 39-111), and for 1769 the figures preferred by Hans. Chr. Johansen (2002, p. 96f.).

<sup>77</sup> Bjurling 1945 p. 159ff., 256.

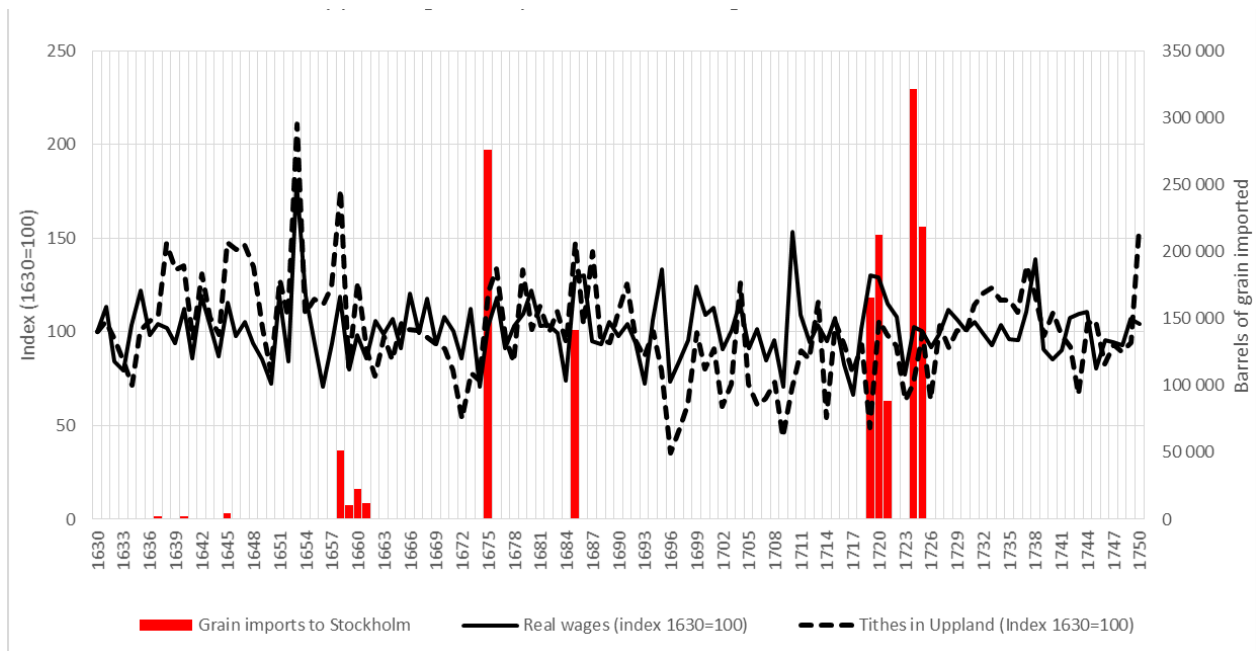
<sup>78</sup> Friberg 1956, Appendix I.

<sup>79</sup> Edvinsson 2015, p. 181.



for the period 1630–1750 (Hallberg et al. 2016). The graph below also includes known grain imports to Stockholm (bars).

**Figure 9. Tithes in Uppland, grain imports and real wages for manual workers in Stockholm, 1630–1750.**



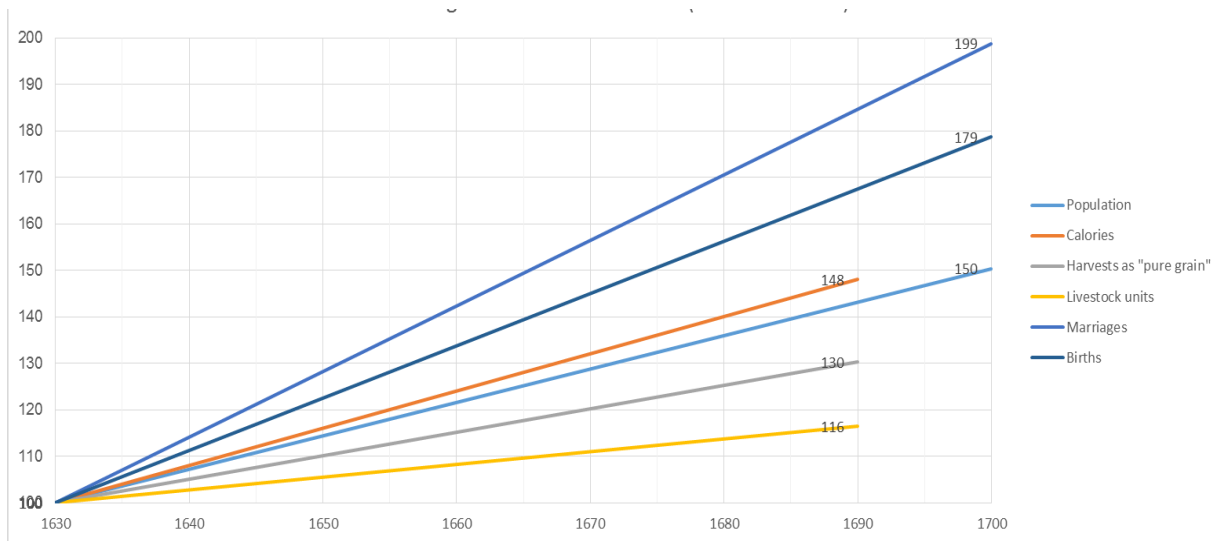
Sources: Boëthius & Heckscher 1938; Leijonhufvud 2001; Hallberg et al. 2016; Söderberg 2010; Stockholms imports 1675 from Stadskamrerarens arkiv, Tolagsräkenskaper 1675, SSA.

The trend for real wages shows no increase or decrease, but for the tithes it declines slightly. The increases and decreases in the two series correspond to a large extent - the diagram indicating that harvests in the region around Stockholm had an impact on real wages (nominal wages being more rigid than harvests and tithes). But particularly one factor must have played a very important role for the growing population of the city, viz., the probable long term change from net grain exports to imports from abroad.

### General conclusions

Altogether, the above analysis supports a lower population assessment for Sweden 1630 than has hitherto dominated Swedish demographic historiography. This in turn entails a relatively fast population growth in the country during the rest of the 17<sup>th</sup> century.

**Figure 10. Linear trends for estimated population totals, available calories for consumption, harvests, livestock, marriages and births 1630-1700 (Index 1630=100).**



Note: a = Population estimate for 1630 from households and MHSs / Population 1700 according to Widén 1976; b = Population estimate for 1630 from CBRs / Population 1700 according to Widén; c = level of caloric consumption ca. 1630 and ca. 1690 according to estimates presented above. Sweden in borders of today.

All trends based on indicators in several independent sources make a strong case for a population in Sweden within its borders of today in ca. 1630 slightly above 900,000 people, and an annual average growth rate 1630-1700 of some 6%.

Previous researchers of population developments in Sweden in the 17<sup>th</sup> seem to have missed much of the contemporary source evidence of fast growth, partly due to conceptions of the century as a period where people were struggling for survival, sinking under burdens of wars, epidemics and famines. One important miss is the immense importance of the ever growing grain imports from the Baltic countries after the middle of the century, often volumes enough to nourish hundreds of thousands of people. The same holds for the redirection of Scania's big grain surpluses to Sweden proper.

Several factors seem to have worked together to support a fast population growth: The growing needs of metal and wood products of the rising maritime powers England and the Netherlands, must have been a strong impetus for mining, tar production etc., in turn opening job opportunities for people outside agriculture, easing barriers to marriage and the forming of new households, stimulating fertility and low ages of marriage for women.

Sweden seems to have been a dynamic part in a vibrant region around the North Sea, also when it comes to population growth. In spite of growing tax burdens and military losses, forces of growth prevailed in the 17<sup>th</sup> century. The trends were followed by a certain lull for periods of the 18<sup>th</sup> century, until new dynamisms led to the "population explosion" of the 19<sup>th</sup> century.

#### *Further research necessary*

The estimate of a little more than 900,000 inhabitants in Sweden 1630 of course has a margin of error. The main problem with reconstructing a population figure for that time period is the uncertainty attending the number of households, especially for some provinces, and here more could be done, for instance, delving deeper into the source material by analysing more of the material from the Älvsborg Second Ransom archives. Primary here is the immense audit

material, in which clerks composed lists for all six terms and followed up on the changes between the years. The task however is not easy task, the archive is large, filling about 8.5 meters of shelves and consists of 86 volumes. However, until such an investigation is undertaken, available empirical facts speak overwhelmingly in favour of a lower population figure for ca. 1630 than that commonly accepted in traditional Swedish historiography.

In addition, further studies into the fertility regime in the 17<sup>th</sup> century should be carried out, especially concerning at what age women first married. In this case, it has been suggested that a more eastern European marriage pattern existed, with women marrying far younger than in the 18<sup>th</sup> century, which led to a high fertility rate.<sup>80</sup>

With regard to the levels of nutrition a pressing issue is to get a better grip on figures relating to cereal imports, even if problems regarding available materials in archives cause scholars to shy away from such an undertaking.

---

<sup>80</sup> Palm 2001, p. 103ff.

## References

- Axelsson, G. E. (1888). *Bidrag till kännedomen om Sveriges tillstånd på Karl XII:s tid*. Uppsala.
- Benedictow, O.J. (2002). Svartedauen og senere pestepidemier i Norge : pestepidemiens historie 1348-1654. Oslo.
- Bengtsson, T& Oeppen, J. (1993). "A reconstruction of the population of Scania 1650–1760", in *Lund papers in economic history*, no. 32 (1993).
- Bergfalk, P.E. (1893†). *Om utomordentliga penninghjälper till kronan under sekstonde århundradet och början af det sjuttonde*. Upsala.
- Bjurling, O. (1945). *Skånes utrikessjöfart 1660-1720: en studie i Skånes handelssjöfart*. Lund.
- Boëthius, B. & Heckscher, E.F. (1938). *Svensk handelsstatistik 1637-1737: samtida bearbetningar = Swedish statistics of foreign trade 1637-1737: contemporary accounts*. Stockholm.
- Demografiska Databasen in Umeå*, division of CEDAR, University of Umeå.
- Desertion* = Gissel, S., Jutikkala, E., Österberg, E., Sandnes, J., & Teitson, B. (1981). *Desertion and land colonization in the Nordic countries c. 1300-1600: comparative report from the Scandinavian research project on deserted farms and villages*. Stockholm.
- Dyrvik, S. (1990). *Norsk økonomisk historie 1500-1970, Bind 1 1500–1850*. Oslo.
- Edvinsson, R. (2015). "Recalculating Swedish pre-census demographic data: Was there acceleration in early modern population growth?". *Cliometrica* (2015) 9.
- Emigrationsutredningen. Betänkande i utvandringsfrågan...* Stockholm 1910.
- Fabricius, K. (1952). *Skaanes overgang fra Danmark til Sverige: studier over nationalitetsskiftet i de skaanske landskaber i de nærmeste slægtled efter Brømsebro- og Roskildefredene. D. 3, (1676-1679)*. København.
- Forssell, H. (1872-1883). *Sverige 1571. Försök till en administrativ-statistisk beskrifning öfver det egentliga Sverige, utan Finland och Estland*. Stockholm.
- Friberg, N. (1956). *The Growth of Population and its Economic-Geographical Background in a Mining District in Central Sweden 1650-1750*. Stockholm.
- Friberg, N. & Friberg, I. (1976). *Sveriges äldsta fullständiga husförhörslängd*. (Second Edition). Stockholms Universitet, Kulturgeografiska Institutionen.
- Friberg, N. & Friberg, I. (1978). *Vikingatidens befolkning i Mälardalslandskapen*, Second edition, Stockholm.

- Friis, Aa. 1942, Schultz Danmarkshistorie : vort folks historie gennem tiderne. Bd 3. København.
- Gadd, C-J. (1983) *Järn och potatis, Jordbruk, teknik och social omvandling i Skaraborgs län 1750-1800*. Göteborg.
- Hallberg, E., Leijonhufvud, L., Linde, M., & Palm, L. Andersson. (2016). *Skördar i Sverige före agrarrevolutionen: Statistisk undersökning av det rörliga tiondet fr.o.m 1665: Introduktion till databaser*. Göteborg. Retrieved April 16, 2016, from <http://hdl.handle.net/2077/42266>
- Heckscher, E.F. (1935). *Sveriges ekonomiska historia från Gustav Vasa. D. 1, Före frihetstiden, Bok 1, Medeltidshushållningens organisering 1520-1600*. Stockholm.
- Heckscher, E.F. (1936) *Sveriges ekonomiska historia från Gustav Vasa. D. 1, Före frihetstiden, Bok 2, Hushållningen under internationell påverkan 1600-1720*. Stockholm.
- Heckscher, E.F. (1969). *Svenskt arbete och liv*. Stockholm.
- Henry, L. (1967). *Manuel de démographie historique*. Genève-Paris.
- Historical monetary statistics for Sweden 1668-2008*. Retrieved from [http://www.riksbank.se/Upload/Dokument\\_riksbank/Monetar\\_hist/Wages1540\\_1850.xls](http://www.riksbank.se/Upload/Dokument_riksbank/Monetar_hist/Wages1540_1850.xls)
- Historical Statistics of Sweden. Part 1. Population. 1720-1967*. Second edition. Stockholm 1969. Retrieved from <http://www.scb.se>.
- Historical Statistics of Sweden. Part 3. Foreign trade 1732-1970*. Stockholm 1972. Retrieved from <http://www.scb.se>.
- Hofsten, E. & Lundström, H. (1976). *Swedish population history main trends from 1750 to 1970*. Stockholm.
- Holmsen, A. (1994†). *Norges historie fra de eldste tider till 1660*. (5th edition.). Oslo.
- Johansen, H.C. (2002). *Danish Population History, 1600-1939*. Odense.
- Jutikkala, E. (1957). Can the population of Finland in the 17th century be calculated?. *Scandinavian Economic History Review*, Volume 5, Issue 2, 1957.
- Larsson, L-O. (1972). *Kolonisation och befolkningsutveckling i det svenska agrarsamhället 1500-1640*. Lund.
- Leijonhufvud, L. (2001). *Grain tithes and manorial yields in early modern Sweden : trends and patterns of production and productivity c. 1540-1680*. (Doctoral dissertation), University of Uppsala.
- Lext, G. (1979). *Mantalskrivningen i Sverige före 1860*. (Reprint). Göteborg.

- Linde, M. (2012). *Sverige 1750 - Åkerbruk, boskapsskötsel, befolkning*. Retrieved April 16, 2016 from <http://hdl.handle.net/2077/31619>
- Linde, M. & Palm, L. Andersson. (2014). *Sverige 1810: Befolkning, jordbruk, skog, jordägande*. Retrieved April 16, 2016, from <http://hdl.handle.net/2077/36641>
- Lindgren, J. (2000). "Men, money, and means", in Contamine, P. (Ed.) *War and competition between states*. Oxford Scholarship Online ([www.oxfordscholarship.com](http://www.oxfordscholarship.com))
- Lundkvist, S. (1974). Rörlighet och social struktur i 1610-talets Sverige. (Mobility and social structure in Sweden, 1610-1619; Summary in English.). *Historisk tidskrift*.
- Lundkvist, S. (1990). "Den äldre svenska folkbokföringen", in *Scriptum* nr 22.
- Morell, M. (1987) *Studier i den svenska livsmedelskonsumtionens historia. Hospitalhjonens livsmedelskonsumtion 1621-1872*. Uppsala.
- Myrdal, J. (2011). "Farming and feudalism, 1000-1700", in Janken Myrdal & Mats Morell (Editors) *The Agrarian History of Sweden. From 4000 bc to ad 2000*. Lund.
- Olsson, Mats & Patrick Svensson (2011). "Agricultural production in southern Sweden 1702–1864", in *Growth and stagnation in European historical agriculture*, M. Olsson, P. Svensson (Editors). Turnhoet.
- Palm, L. Andersson. (1993). *Människor och skördar. Studier kring agrarhistoriska metodproblem 1540-1770*. Göteborg.
- Palm, L. Andersson. (2000). *Folkmängden i Sveriges socknar och kommuner 1571-1997*. Göteborg.
- Palm, L. Andersson. (2001). *Livet, kärleken och döden : fyra uppsatser om svensk befolkningsutveckling 1300-1850*. Göteborg.
- Palm, L. Andersson. (2012a). *Sverige 1690. Åkerbruk, boskapsskötsel, skog, befolkning*. Retrieved April 16, 2016, from <http://hdl.handle.net/2077/30585>
- Palm, L. Andersson. (2012b). *Sverige 1630. Åkerbruk, boskapsskötsel, befolkning*. Retrieved April 16, 2016, from <http://hdl.handle.net/2077/31820>
- Palm, L. Andersson. (2013). *Sverige 1570. Åkerbruk, boskapsskötsel, befolkning*. Retrieved May 15, 2016, from <http://hdl.handle.net/2077/34063>
- Petersen, E. Ladewig. (1980). *Fra standssamfund til rangsamfund 1500-1700. Dansk socialhistorie*, vol. 3.
- Seppel, M. (2015). "Feeding the motherland: grain exports from the Swedish Baltic provinces during the Great Famine of 1696-1697", in. *Scandinavian Economic History Review*, 63:3.
- Schön, L. & Krantz, O. (2015). New Swedish Historical National Accounts since the 16th Century in Constant and Current Prices. *Lund Papers in Economic History*, No. 140, 2015.

Sogner, S. (1996). *Aschehougs Norgeshistorie. Bd 6, Krig og fred : 1660-1780*. Oslo.

SSA = Stockholms stadsarkiv.

*Statistisk tidskrift*, 129. häftet (1903). Stockholm.

Sundquist, S. (1938). *Sveriges folkmängd på Gustaf II Adolfs tid*. Lund.

Sundquist, S. Excerpts in the War Archives (Krigsarkivet). Stockholm.

Söderberg, J. (2010). *Long-term trends in real wages of labourers, Exchange Rates, Prices, and Wages, 1277-2008*. Retrieved from [http://www.riksbank.se/Upload/Dokument\\_riksbank/Kat\\_foa/2010/9.pdf](http://www.riksbank.se/Upload/Dokument_riksbank/Kat_foa/2010/9.pdf)

Utterström, G. (1978), *Fattig och föräldralös I Stockholm på 1600- och 1700-talen*. Umeå.

van Zanden, J. L. (1993). *The Rise and Decline of Holland's Economy: Merchant Capitalism and the Labour Market*. Manchester.

Virrankoski, P. (1973). ”Pohjois-Pohjanmaan maakuntaliiton ja Lapin maakuntaliiton yhteinen historiatoimikunta”, in *Pohjois-Pohjanmaan ja Lapin historia. 3, Pohjois-Pohjanmaa ja Lappi : 1600-luvulla*. Oulu.

Widén, L. (1976). “A retrojection back to 1700”, appendix 2 in (red.) Hofsten, E. & Lundström, H. *Swedish population history main trends from 1750 to 1970*. Stockholm 1976.

Wrigley, E.A. & Schofield R.S. (1989). *The Population History of England 1541–1871. Part of Cambridge Studies in Population, Economy and Society in Past Time*. Cambridge.

Åkerman, S. (1986). ”Befolkningsexplosion eller barnbegränsning. Gotlands befolkningsutveckling under tidigt 1700-tal”, in *Scandia* 1986:1.

Åmark, K. (1915). *Spannmålshandel och spannmålspolitik i Sverige 1719-1830*. Stockholm. Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-57937>.