Assessing trade in the mercantilist era: evidence from a new database on foreign trade of Sweden – Finland, 1738–1805

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ABSTRACT
This paper presents a newly constructed database on foreign trade of Sweden-Finland 1738–1805, consisting of all exports and imports that were recorded by the custom houses in this period, and is made available at www.historia.se/Swedish foreign trade 1738_1805.xlsx. The traditional view as presented by Eli Heckscher, who was very critical of the mercantilist policies of the time, was that the overseas trade of Sweden-Finland saw a trend of secular stagnation during the course of the eighteenth century. By contrast, we show that in conjunction with a substantial expansion of the population, total trade nearly increased twofold during the period of study. Despite that, there was a small decrease in the value of exports in relation to GDP, mostly explained by a drop in the relative price of bar iron. The degree of specialisation of Swedish exports saw a declining tendency in this period. While exports from Sweden had a higher degree of specialisation than Finnish exports, imported goods to Finland were more concentrated than Swedish imports. Lastly, the composition of imports did not markedly alter, meaning that a consumer revolution did not take place in either Sweden or Finland.

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1. Introduction
Recently, a research project was initiated that investigates international trade statistics from the eighteenth century. These statistics are of high importance for understanding early globalisation and industrialisation, but have hitherto been underutilised (Charles & Daudin, 2015, pp. 7–12). In the case of Sweden, the National Archives houses detailed statistical sources on foreign trade that were compiled under the auspices of the National Board of Trade. Despite the rich primary sources, no effort has previously been made to systematise the trade of all goods, even for later periods.\textsuperscript{1} This paper attempts to fill this gap by presenting a newly constructed database on all imports and exports that were recorded 1738–1805.\textsuperscript{2} Finland belonged to Sweden until 1809, when it was annexed by the Russian Empire, and for this reason the data also includes Finnish trade. In the present study, we assess whether there was growth, stagnation or contraction in Swedish...
foreign trade, how its specialisation evolved, and what impact trade had on the pre-modern Swedish economy.

Two complete statistical series are available for inquiry. These are Kommerskollegi (Kommerskollegium) årsberättelser, Berättelser om utrikes handel och sjöfart, series 2 and 3. Series 2 is labelled generalpersedelextrakt, and this series, for the most part, comprises quantities of the imported and exported goods, 1738–1812, while the balance of trade statistics and values are presented in series 3, 1738–1813, at a more aggregate level. This paper expands on the former series, whose data is deemed to have a higher degree of reliability for quantification of trade flows over time, owing to the larger measurement uncertainty of the prices of the imported and exported goods in the latter series (Statistics Sweden, 1972, pp. 3, 5, 19). Limited research has been conducted on Swedish foreign trade and shipping in the eighteenth century (Müller, 2004, p. 23). This is also the case of the area of research in the present study. The available statistical material on Sweden’s eighteenth century trade was previously mainly discussed in Swedish texts several decades ago by Heckscher (1940, 1949b), Högberg (1969), Vallerö (1969), Statistics Sweden (1972), and more recently Häggqvist (2015). Both Heckscher and Högberg studied long-run data trends, while Vallerö established how the data was collected and organised. Högberg’s series consisted of aggregated quantities of the most important traded goods which were converted to tonnage. Heckscher employed the balance of trade series in order to estimate trade flows for the period 1738–1813. Heckscher’s conclusion was that despite the volatile trade flows, trade was stagnant over the entire period, inasmuch as neither imports nor exports exhibited a decisive shift upward or downward (Heckscher, 1949b, pp. 649–652). This meant that the total value of foreign trade was similar in the early nineteenth century as at the outset of the period in the 1740s, despite strong population growth.

Häggqvist (2015, pp. 70, 71, 75) reconstructed volumes for exports and imports 1780–1830. His purpose, time period and method differs from the present study. Moreover, Häggqvist’s study is restricted to a sample of the total recorded goods exported (24 goods) and imported (35 goods), thus for example excluding all textile exports from the analysis. The limitation of goods diminishes the possibility to analyse specialisation and import concentration.

According to earlier research, an explanation for the retrogressing imports was a marked drop in the importation of grains from the end of the eighteenth century, because Sweden was on the path to achieving self-sufficiency in agriculture (Adamson, 1991, p. 33; Heckscher, 1949b, p. 650). Exports were dominated by iron, and therefore the export trends of this staple roughly equalled the total export figures. These exports started to increase from the 1760s, peaking at the beginning of the 1790s, subsequently followed by a rapid decline (Heckscher, 1949b, p. 652). Heckscher (1949a, pp. 386–400) argued that the regulation of the ironworks (smidesregleringen), with the enforcement

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3The term ‘generalpersedelextrakt’ generally entails that the imports and exports are summarised on an annual basis as opposed to the monthly ‘persedelextrakt’. Sometimes the terms were interchangeable. The former was produced by the National Board of Trade and the latter by the customs authorities (see Vallerö, 1969, pp. 16, 78, 134).

4The yearly balance of trade data (series 3) is illustrated as balance sheets, with the total value of imports on the debit side (left), and the total value of exports on the credit side (right), showing the difference as either an import- or export surplus. The other series (series 2), specify the type of goods that are exported and imported, predominantly according to various quantity measures, and sometimes values, or both quantities and values (Vallerö, 1969, pp. 13, 68). The trade balance data in series 3 were estimated by the National Board of Trade on the basis of the quantities of the goods in series 2.

5Statistics Sweden (1972) conducted a survey on Sweden’s foreign trade, for the entire period 1732–1970. For the time period relevant to this study, this document includes a variety of analyses, including the balance of trade, plus quantities and values of the most important exports and imports, also with respect to the key foreign destinations and domestic harbours.

6Häggqvist’s (2015) dissertation analyses Swedish trade policy by examining tariff levels for the period 1780–1830.

7The selected goods for exports were iron and steel, pitch, tar and planks, and for imports only salt and grain (see Högberg, 1969, pp. 21–22).

8These results of Heckscher (1949b) are illustrated in the separate folder of diagrams and cartograms (Heckscher, 1949c), for example, diagram XXVII (value of imports) and XXIX (value of exports). The annual series may be accessed from the Heckscher Archive at the National Library of Sweden.

9Iron dominated Sweden’s export basket already during the sixteenth century and this did not change until well into the nineteenth century (Hildebrand, 1987, pp. 9–10).
of production ceilings impacted negatively on the volume of iron exports.\(^{10}\) An important purpose of this restriction was to increase the price of Swedish bar iron on international markets (Florén, Isakson, Rydén, & Ågren, 1993, pp. 17–19; Heckscher, 1949a, pp. 386–400). Moreover, according to Heckscher’s results (1949b, p. 675), the total tonnage increased by almost two and a half times.\(^{11}\) Heckscher could not explain why the data displayed this huge discrepancy between the value of foreign trade and the tonnage.\(^{12}\) Högberg (1969, pp. 15–19, 24–25) attempted to arrive at more accurate figures of the tonnage.\(^{13}\) These results demonstrated that the expansion was more moderate than the findings of Heckscher notwithstanding, the progression was on the whole similar, since it nearly doubled. Unlike Heckscher (1949b), Högberg (1969, pp. 24–25, 238–239) showed that there were similarities when comparing the quantitative development of trade in proportion to the tonnage, mostly for exports that showed an increase. However, imports were lower and more uneven than the corresponding tonnage. Our database sheds new light on this discussion and shows why Heckscher substantially underestimated the evolution of foreign trade during the era of mercantilist policies.\(^{14}\)

In the next section of the paper, we contextualise our study in relation to the overall development of the eighteenth-century Swedish economy. The subsequent section discusses the reliability of the statistics. After that, we outline the method used in this study, and finally, discuss the evolution of foreign trade and its specialisation.

2. Economic development in Sweden and Finland during the eighteenth century

International trade is often seen as an important catalyst for long-term patterns of economic growth. In certain instances, there is a positive correlation between exports and aggregate domestic production, fostering industrialisation and thus structural transformation of agrarian economies (Åkerman, 1960, pp. 185–186). During the eighteenth century, however, Sweden was, by all means, an agrarian society.

In eighteenth-century Sweden poverty was widespread and a substantial part of the population lived barely at the subsistence level (Koblik, 1975, pp. 8–9). In this agricultural economy, the welfare of the inhabitants depended on the good fortune of weather conditions and harvests. Throughout the eighteenth century, Sweden saw a period of long-run stagnation in terms of per capita income, persisting until the mid-nineteenth century (Edvinsson, 2013, p. 45, 2014, p. 140; Schön & Krantz, 2012, pp. 538–539). This development aligns with van Zanden’s (2001, p. 84) statement that stagnation seems to have been the normal condition in Europe during the early modern period. Edvinsson (2013, p. 57) attributes the slow growth to the dominant agricultural sector, which displayed a stagnating long-term tendency. Swedish real wages also tended to be stagnant (Bengtsson & Dribe, 2002, pp. 4–7), or even declining (Söderberg, 2010, p. 457), and more so during the inflationary period of the 1780s until 1810 (Schön, 2012, pp. 64–65). Height is an indicator of nutrition intake and

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\(^{10}\)It also needs to be mentioned that British ironmaking quickly expanded during this period, when coke became a source for iron production. Moreover, there was competition from Russia, whose ironmaking increased in this period, reaching production levels that were similar to those in Sweden (Hildebrand, 1987, p. 14).

\(^{11}\)Data on the tonnage of outgoing and incoming domestic and foreign ships can be extracted from the appendices of the trade balance statistics (Högberg, 1969, p. 10).

\(^{12}\)Heckscher remarked that the unabated growth of shipping either was occasioned by an increase in the total volume of foreign trade or was attributed to an unfavourable trade-off between shipment and tonnage. The latter explanation would have entailed that a greater number of ships carried ballast, however, his findings showed that the opposite was true. Also, smuggling could not have been the reason, when taking into account that prohibitions on trade were eased during the Gustavian era. Lastly, a relative increase in bulky goods was not likely to explain the discrepancy. The reason is that import of grain was declining during the period (Heckscher, 1949b, p. 675).

\(^{13}\)Heckscher’s data did not cover the entire period, and the actual changes in the tonnage during the eighteenth century were more uneven than his results, according to Högberg. Data can be drawn from the trade balance statistics and their preparatory documents when determining the tonnage for some years, but not for the period 1754–1768. Therefore, Högberg used preserved shipping documents (sjöfartsförteckningar och tolagsjourner) for Stockholm and Gothenburg, plus statistics on the shipping over Öresund as substitute sources (see Högberg, 1969, p. 15).

\(^{14}\)The database will be continually updated and made available online at www.historia.se/Swedish foreign trade 1738_1805.xlsx
consequently also income. According to Sandberg and Steckel (1987, p. 107), the stature of male inhabitants decreased during the eighteenth century, which also points to an economy that was less propitious for growth. Morell (2011, p. 117) and Essemyr (1983, p. 15) argue that there was a shift to a poorer diet quality, because animal source foods were increasingly substituted by predominantly rye and other cereals.

The real wage restraint and the greater importance of grains as a source of nutrition can be explained by the sharp population increase in both Sweden and Finland. The Swedish population increased by around 41%, 1738–1805, while it more than doubled in Finland. Altogether, there was a population upsurge in Sweden-Finland from 2.1 to 3.3 million inhabitants. This growth raises the possibility that the economy became more specialised and diversified. An argument why this was not the case is that the town population as a proportion of the total population stagnated suggesting that the population growth mainly occurred within the framework of the agrarian society.

Economic thought that was labelled by political economists as mercantilism during the second half of the eighteenth century was dominant in the early modern period. Accordingly, such principles also underpinned Swedish economic policy. The idea was that successful economic development was contingent on an economy that was carefully orchestrated by the state. The national profit was defined as the difference between the value of exports and imports, and therefore a principal aim was to generate a trade surplus. To accomplish this, tariff protections were enacted and export subsidies were promoted. Foreign raw materials enjoyed lower import duties, while the opposite was the case for manufactures. Also, export duties escalated for raw materials. These tariff policies served a dual purpose, both supporting domestic manufactories and achieving an improvement in the trade balance (Ahlström, 1993, pp. 3–7; Statistics Sweden, 1972, p. 42). Tariffs were also implemented to generate government revenue. Among imports that were taxed relatively highly in this context were luxury goods such as coffee, wine, spirits, sugar and tobacco (Häggqvist, 2015, pp. 124–125). These types of tariffs were imperative for the foundation of state bureaucracies during the early modern period (Pomeranz & Topik, 2015, p. 82).

Foreign trade was prohibited in the inland towns (uppståder) and only allowed in a few staple towns (stapelstäder) of which shipping activity was the most frequent in the ports of Stockholm and Gothenburg. Expansion of shipping capacity was made possible by Produktplakatet of 1724 (The Commodity Act), which was the Swedish adaptation of the British Navigation Acts. This mercantilist legislation prohibited foreign vessels to transport goods into Swedish ports, unless the cargoes originated from their country of origin or colonial territories. Foreign bottoms were allowed to export Swedish goods, however, impeded by the Commodity Act, this would in certain instances mean that the vessels had to enter Swedish ports in ballast. Thus, under the provisions of this statute, according to Heckscher, Swedish exports became less competitive on international markets. Also, Heckscher argued that the restrictions on imports and the state-backed Swedish shipping privileges

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15 A common pattern is that peoples’ nutritional needs increasingly are derived from grains instead of animal source foods when there is population growth (Magnusson, 2016, p. 45).
16 The population figures of Sweden are derived from Edwinsson (2015, p. 187) for the year 1738, and Statistics Sweden (1999, p. 44), for 1805. Data for Finland is from Mitchell (2003, p. 4) back to 1750 and interpolated numbers back to 1738. These Finish population figures show an identical long-run pattern to that of Jutikkala (1965) for the years 1738–1748, and Statistics Finland, 1749–1805. The latter data were provided by M. Voutilainen (personal communication, April 17, 2018).
17 The urban death rate was higher than the death rate in rural areas, and rural Sweden also had higher birth rates. Moreover, during the period of our study, the urban rate of natural increase was negative. It was only the positive rural rate of natural increase that through migration contributed to any limited urban growth that occurred (Dyson, 2011, pp. 41–44).
18 The term mercantilism became widespread when the Wealth of Nations (1776) was published, as Adam Smith denounced this type of protectionism, advocating free trade. According to Magnusson (2004, pp. 70–71), it was Victor de Riqueti, Marquis de Mirabeau (1763) that first alluded to mercantilism in writing, mentioning systèmes mercantile, criticising that large trade surpluses and the resultant importation of money would profit countries.
19 One common tariff measure was that both vessels and exports by foreign ships were liable for customs duties that were 50 percent higher than those on domestic vessels. This was termed ‘helfrihet’ (total exemption), which was only allowed for larger Swedish ships (see Högborg, 1969, p. 28). Total exemption still meant that Swedish vessels had to pay customs duties, albeit lowered by a third. Smaller Swedish vessels were accorded ‘halvfrihet’ (half exemption) and had to pay higher duties on imports and exports than those of total exemption. Duties on these vessels were relaxed by one-sixth (Heckscher, 1949b, p. 670).
entailed that grain and salt imports tended to become more expensive (Heckscher, 1940, p. 25, 1949b, pp. 670–671). Nevertheless, an important objective of the Commodity Act was to secure and control the strategic imports of salt by blocking out hulls operated by foreigners (Carlén, 1997, p. 248). Another protective regulation was the ban on exports of timber. This enactment sought to secure wood for ironmaking and to a certain extent prohibit exports of less refined wood products (Statistics Sweden, 1972, p. 45).

There were divisions among Swedish politicians with regard to the mercantilist policies. The Hat party was in power for the longer periods 1738–1766 and 1769–1771, and the accession to power of the Cap party in 1771 came to a halt with the 1772 coup d’état. The former party acted in the interests of the wealthy merchant capitalists that benefited from state interventionism. The latter party that represented small businesses, including importers, opposed the mercantilist policies (Eagly, 1969, pp. 751–752). Anders Chydenius, a protagonist of the Cap party and pastor of Finnish descent, became known as an ardent supporter of laissez-faire more than a decade before Adam Smith. During the Age of Freedom (1719–1772) and its heated political debates, Chydenius vigorously opposed the Commodity Act, not least in his 1765 pamphlet Källan till Rikets Vanmakt (The Source of the Nation’s Weakness). This opposition came from a strong conviction that the Commodity Act monopolised trade and benefited the staple towns, and consequently the larger urban merchants at the expense of the other regions and their enterprises (Lönnroth, 1991, pp. 34–36). A basic tenet of Chydenius critique of the Commodity Act was that the monopoly it enforced in favour of Swedish shipping and merchant activity caused to restrict trade and increase freight rates. As a consequence, there was upward pressure on both the prices of imports and exports. Therefore, Chydenius argued that export markets for Swedish goods shrank and there were weaker incentives for the ironworks and other enterprises to produce (Chydenius, 1880, pp. 113, 130, 430).

3. Reliability of the statistics

Heckscher stated that the Swedish trade statistics from the eighteenth century have a high level of accuracy, and therefore argued that it would be desirable to publish them to a wider audience (Statistics Sweden, 1972, p. 7). Ernst Söderlund, on the other hand, held that in particular the values of imports and exports in series 3 are not reliable (Högberg, 1969, p. 20). Vallerö (1969, pp. 121–124) discussed these data and the conclusion was that there is a degree of uncertainty how the data were constructed. Recalculations of export prices appear to have been made on the basis of both price schedules of goods in Stockholm and invoices. It was desirable to acquire import prices from foreign ports. However, this was often not possible, meaning that invoices, tariff rates, average prices, and other unknown methods were adopted for estimating import prices. From 1783 average prices of imported goods were used and these prices were fixed. In the present study, we have by and large overcome the obstacle of price uncertainty in the primary material by relying solely on series 2 for our calculations. This series measures for the most part the goods according to various quantities. In this series a limited number of exports and imports are reported in currency units. According to our observations of the primary data these prices were administratively fixed.

The statistical series includes data on the port of lading, foreign destination, type of good, and the quantity, or value of the good. In the present study, we estimate trade volumes over time. Thus, data on the port of origin and destination are not included. The imported and exported goods are typically specified in a quantity measure (weight, length, number of goods). In order to expand our knowledge of the accuracy of the trade statistics, we need to know how the data were collected and synthesised. Figure 1 is a simplified sketch of this process that henceforth is briefly summarised, arranged on the basis of imports.

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20Salt was essential for food security as it was used for the preservation and processing of meat, fish, milk and cheese (Carlén, 1997, pp. 70–71).
As an incoming ship docked at the staple town, the shipmaster provided the documents for customs clearance to the custom house, including a roll specifying the ship and its cargo. Prior to the inspection of the ship, the master signed the roll, attesting no more goods to declare, and the roll was sealed. If goods not specified in this manifest were detected, this cargo was seised. Transcripts of the requisitions of the domestic merchants and the manifest were submitted to the staple town’s highest administrative board, for the purpose of calculating stamp duties and fees for the maintenance of the port (tolag), collected by the staple town. At the same time, the custom house determined import duties that were payable to the national tax administration. The cargo was released on the condition that the domestic merchants had paid the various customs duties. All the unloaded cargo was registered by the custom house, where these data were collated with the other import records (Vallerö, 1969, pp. 22–25).

As can be seen, the staff at the custom house examined the various documents in order to determine the accuracy of the categories and quantities of the imported goods. Even so, they would likely face difficulties assessing disparities between the documents and accurately correcting these differences. Smuggling was highly prevalent (Johnson, 1959, p. 84; Statistics Sweden, 1972, pp. 28, 158), which would tend to affect imports more than exports. This indicates that the inspections of the ships were not effective. In addition, double registration of goods occurred with respect to exports, which was possible also for imports. When ships entered several Swedish ports on the one and same route the freight could be registered by the custom houses more than once (Vallerö, 1969, pp. 70–71).

The discussed records on import and export were prepared in two further stages. First, *persedelextrakt* were documents in which incoming and outgoing goods were registered monthly by a customs house. At the year-end closing, every customs house produced an annual report of the monthly persedelextrakt, which was submitted to the National Board of Trade. Second, these yearly foreign trade data from the custom houses were organised by the National Board of Trade as *generalpersedelextrakt*, the official Swedish statistics on foreign trade (Vallerö, 1969, pp. 15–16, 68, 78–79). There were multiple stages in which the data were processed, meaning that human errors likely have occurred during each stage. However, unlike the trade balance statistics of series 3, series 2 was organised according to the same methodology by the National Board of Trade (Vallerö, 1969, p. 68).

The customs procedures for monitoring exports were not as complicated as for imports. The protectionist policies during the mercantilist era reinforced the inherent inclination of states to control
their borders. Therefore, it was of higher importance for the custom houses to pay closer attention to the declaration of imported goods than exports. The objective of mercantilist trade policy was to accumulate monetary reserves by maintaining a positive balance of trade. A consequence of this could have been that the custom houses had a certain predilection for registering exports. It is also possible that there was a more lenient attitude towards domestic trading companies that dominated the market. As stated by Magnusson (1978, pp. 118–119), during the eighteenth century, a few large merchant companies emerged in Stockholm and Gothenburg that monopolised Sweden’s overseas trade.

4. Method

4.1. Estimation of the values of exports and imports

The primary material does not categorise trade between Sweden and Finland as overseas trade. Therefore, we do not account for trade between the two countries. On the other hand, the National Board of Trade designated Swedish Pomerania as a foreign destination. Consequently, in our study trade flows between Sweden-Finland and this erstwhile dominion are included as part of aggregate imports and exports. The ships of the Swedish East India Company were not consistent in declaring cargo when arriving in Gothenburg, which was the staple town of this venture. However, shipping details were provided when departing to foreign destinations. Our investigation shows that imports by the East India Company are not included in the statistics of The National Board of trade, series 2. Imports of tea and porcelain are significantly lower than presented in Lind (1923, pp. 180–183) and Nyström (1883, pp. 92–112). Therefore, we have complemented the data with the more elaborate latter source. Figures on the East India Company were also missing for a number of years. We adjusted this by interpolating these data, employing the values of proximate years as indicators. Similar to Schön (1984) we have not included re-exports as part of total exports.

Schön also deduced re-exports from imports notwithstanding, when examining the source material, we have concluded that re-exports are not included in the import data. Therefore, we eschewed this step. The procedure we have followed when estimating the volume of trade and nominal values is different to that of Heckscher (1949b, p. 648). Heckscher deflated his nominal data with a price index that did not reflect the composition of foreign trade, while we argue that deflators of export and import must be based on the actual export and import prices. First, we estimated the quantities of all the goods in the database. Second, these series were used to calculate the volume value of trade. Third, the volume of exports and imports were transformed into nominal values. Exports and imports consist both of goods and services. Exports of goods can be valued according to two different methods:

1. f.o.b. (free on board) prices, which can be regarded as the purchasers’ price that would be paid by importers if loaded on their own carrier at the exporter’s frontier.
2. c.i.f. (costs, insurance, freight) prices, which can be regarded as the purchasers’ price that would be paid by importers if taking delivery of goods at their own frontier.

The difference between c.i.f. and f.o.b. values consists of the costs of transports and insurances between the customs frontier of the exporting and importing country (Inter-Secretariat Working Group on National Accounts, 1993, pp. 323–324). Two methods are therefore adopted when recording imports and exports (Statens Offentliga Utredningar, 2002, pp. 73–75):

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*By its very nature mercantilism entails regulation of imports. The bedrock of mercantilist thought and policy was that national prosperity was dependent on an export surplus, and consequently, it was critical to combat smuggling. Moreover, the Swedish Commodity Act was to ensure that foreign ships only carried goods from their country of origin which necessitates rigorous inspections of inbound vessels.*
(1) **Recording on a c.i.f./f.o.b. basis.** When imported goods are valued in c.i.f. prices, the costs of both domestic and foreign firms for transporting and insuring the goods between the customs frontier of the exporting and importing country are included. However, exports are always valued in f.o.b. prices, and to keep the balance between total exports and imports, transport and insurance costs of domestic firms for importing and exporting goods are included in the exports of services.

(2) **Recording on an f.o.b./f.o.b. basis.** When imported goods are valued in f.o.b. prices, the costs of foreign firms for transporting and insuring imported goods are reclassified into imports of services, which however has no impact on the amount of overall imports. The costs of domestic firms for transporting and insuring imported goods must then be deducted from both imports and exports, as estimated according to the first method.

Even if the two methods produce different values for total imports and exports, they yield the same result for net exports (total exports less total imports). Statistics Sweden recorded imports and exports on a c.i.f./f.o.b. basis before there was a switchover to the 1993 System of National Accounts, when trade was recorded on an f.o.b./f.o.b. basis. The f.o.b./f.o.b. is preferable from a theoretical point of view, not least because it avoids double counting the costs of domestic firms for transporting and insuring imported goods. On the other hand, it is more difficult to put into practice (SOU, 2002, p. 75). Therefore, the present study estimates exports and imports based on Swedish market prices. This means that we record exports and imports according to the c.i.f./f.o.b. procedure. Recording on an f.o.b./f.o.b. basis requires knowledge of the prices of goods at the foreign harbours exporting to Sweden. This complex exercise is not possible to perform in this study.

Given that the value series of the primary source material is not as reliable as the quantity series, this series is still appropriate for estimating relative prices of goods (see Statistics Sweden, 1972, p. 3). We have also employed price data on commodities from Jörberg (1972, pp. 631–709), and Carlén (1997, pp. 346–347), with regard to salt. These price data, labelled as price \( p_{X,t} \) for good \( X \) in year \( t \), were compared to the prices of the data from the Swedish National Board of Trade, \( p_{X,SNBT} \). Data on \( p_{X,SNBT} \) were available for the majority of goods, while prices for outstanding goods were based on guesstimates derived from prices of similar goods, termed as nearby goods. For example, the price of oliphant paper was assumed to be the same as for other types of paper. \( p_{X,SNBT} \) can be defined as a constant price for good \( X \), although we do not know if these prices ever corresponded to actual market prices. We first estimated the geometric mean (GM) market price for the period 1738–1750, \( p_{X,1738–1750} = \text{GM} (p_{X,i}) \) \((1738 \leq i \leq 1750)\), which was used as a constant price for good \( X \). The next step was to estimate the ratio \( p_{X,1738–1750}/p_{X,SNBT} \) for a number of goods. The choice of nearby goods depended on what goods were included in the database. For most goods we did not have \( p_{X,1738–1750} \), which instead we estimated as:

\[
\hat{p}_{X,1738–1750} = p_{X,SNBT} \ast \text{GM}(p_{\text{nearby goods to } X,1738–1750}/p_{\text{nearby goods to } X,SNBT})
\]

In doing so, constant prices of the period 1738–1750 were estimated for all goods. After that, we estimated the nominal values for a year \( t \). For a number of goods, we estimated the ratio \( p_{t}/p_{1738–1750} \) and those goods for which no annual market price data were available we used the geometric average ratio of \( p_{t}/p_{1738–1750} \) of nearby goods (as an example, we made the assumption that the change in the price of tin and lead was similar to that of the price of copper), i.e.

\[
\hat{p}_{X,t} = \hat{p}_{X,1738–1750} \ast \text{GM}(p_{\text{nearby goods to } X,t}/p_{\text{nearby goods to } X,1738–1750})
\]

There were no quantities available for the most part of the time period for commodities that together constituted less than 10% of the total value of all goods. These goods were instead denominated in daler silvermynt up to 1777, or riksdaler specie from 1778. In this case, we made the assumption that the administratively fixed prices that formed the basis for calculating these values did not alter during the entire period 1738–1805. This is also the case when reviewing an individual commodity as rye.
Adjustments seem to have occurred only after the convertibility of the riksdaler banco was suspended, after 1808. It also became apparent when examining the administratively fixed prices, defined as $p_{SBNT}$, that one riksdaler was equal to three daler silvermynt from 1738 until 1777. This was the case despite that the market exchange rate of the riksdaler increased to six daler silvermynt by the end of the period.

Figure 2 depicts the ratio of the estimates of exports and imports of Schön (1984) and Häggqvist (2015) in relation to the present study. This observation is made for the years 1800–1805 because Schön’s series starts in 1800. These data are not fully comparable. Schön’s estimates are restricted to trade within Sweden’s present borders, and are also adjusted for trade with Finland. However, as can be seen, these alterations do not markedly change the export- and import values on an aggregated level. Unlike our estimates, Häggqvist’s estimates do not include all exported and imported goods that were registered by the custom houses. We have divided Schön’s (1984) export data by 0.9 since he reduced exports by 10%. This entails that his values of goods exported do not correspond to f.o.b. prices, the usual practice, although with services included there is no change at the aggregate level. His procedure entails that 10% of the value of exported goods are viewed as export of internal transports.

As seen in Figure 2, the export values of Schön are overall slightly lower than the present study. What may be cause for concern is that the values of imports are substantially higher in Schön’s study for the years 1800–1801 compared to the present study. A possible explanation is that Schön (1984) did not conduct a full investigation of the material. Also, Schön’s estimates concern Sweden within present borders, and not Sweden–Finland. Häggqvist (2015) puts total imports and export markedly below the estimates of the present study and Schön. This may be explained by a limited number of imported goods covered in his study.

### 4.2. Determining economic specialisation

An important indicator of the impact of trade on a country’s economy is economic specialisation. As early as 1776 Adam Smith argued in the *Wealth of Nations* that economic growth could be explained
by the division of labour. As workers and industries increasingly specialise in economic activities productivity improves, suggesting that complexity is strongly correlated with per capita income. In this regard, complexity is dependent on a country’s non-tradable capacities, including labour skills, organisation, property rights and regulation. Other factors involved with complexity are that countries with a narrow range of products have many capabilities, while countries with ubiquitous products, exported by all countries have fewer capabilities. The former countries are more diversified and export products that tend to require peculiar skills and resources (see Hidalgo & Hausmann, 2009). The structure of foreign trade is determined by examining export specialisation and the degree of concentration of imports. In so doing, we identify the most important traded goods of Sweden-Finland over the period studied which provides clues about complexity. Two commonly used measures of specialisation are the Hirschman-Herfindahl-Index (HHI) and the Shannon Entropy Index. The Hirschman-Herfindahl-Index is calculated as follows:

\[
HHI = \sum_{i=1}^{n} b_i^2
\]

In the formula \( b_i \) is the share of sector \( i \) in total value, and \( n \) the total number of sectors. The higher the degree of specialisation, the higher the value for this index where complete specialisation equals unity (one), as in this particular case only a single economic sector exists. A disadvantage with the HHI index is that it can be dominated by one sector when producing a number close to one, while the development of smaller sectors does not have any great impact. The Shannon Entropy Index (SEI) partly remedies this and is calculated as:

\[
SEI = -\sum_{i=1}^{n} b_i \ln(b_i)
\]

Due to the logarithmic form of the index, the impact of larger industries is reduced compared to the HHI. In contrast to the Hirschman-Herfindahl-Index, higher specialisation entails a lower Shannon Entropy Index, meaning that during complete specialisation the index equals 0. A drawback is that the index is undefined if \( b_i = 0 \). However, given that \( b_i \ln(b_i) \to 0 \) when \( b_i \to 0 \), we set \( b_i \ln(b_i) \to 0 \) when \( b_i \) is 0. The values of the indices depend on classification, i.e. how many sectors are included. In the present study, two levels of classification are applied. First, a broad classification into 10 sectors or branches is used, which is the same for exports and imports. Second, there is a more fine-tuned classification into 90 types of goods for exports, and 69 types of goods for imports. The categorisation in types of goods for imports and exports are similar for some of the products.

5. Empirical results

5.1. The evolution of exports and imports

In total, the number of categories of imported goods to Sweden-Finland that is registered in our database was 882. The total number of categories of exported goods was 388. For multiple goods, annual data on imports and exports was missing over the time period. The database consists of over 85,573 non-zero trade flows, counting flows to- and from Sweden-Finland, also Sweden and Finland separately.

Figure 3 depicts the number of types of goods exported and imported, and the development of the volume of exports and imports for Sweden-Finland under the period of our investigation. The number of categories of imported goods to Sweden-Finland as a whole declined almost by a half over the period, while there was almost a twofold increase in the number of categories of imported goods to

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22The positive relationship between complexity and economic growth is also identified by Romer (1994) and Grossman and Helpman (1989).
This could reflect the growing share of Finland in total population of the Swedish kingdom, and mercantilist policies, including import restrictions. An explanation for this shift is also that the classifications of goods changed over time. However, during the period 1738–1805, the composition of imports to Sweden-Finland still did not become more differentiated. The growing number of goods that were imported to Finland may be explained by a gradual relaxation of Swedish staple legislation at Finnish ports. As Ojala (1999) has stated, this should also be the case for Finnish exports, because from 1765 there was an emergence of Finnish staple towns.

The number of categories of exported goods from Sweden-Finland was first stable and then increased during the end of the 1770s, followed by a peak in the mid-1780s, and thereafter declined. This could indicate that the specialisation of exports did not change much, or even was declining. However, we also need to consider the volumes and value shares of the exports. Figures 4 and 5 outline the development of foreign trade, expressed as three different ratios: 1) exports or imports to GDP 2) the volume value of exports or imports per capita 3) and the export deflator or import deflator to the GDP deflator. Although total exports and imports increased during the period, this increase largely followed population growth. The main measures of the level of international integration are volume per capita exports and imports, and the nominal ratio of exports and imports to GDP. The two figures also present the development of the relative prices of exports and imports, which has an impact on the development of the nominal ratio of exports and imports to GDP.

Per capita levels are the most important to study because growth in total exports and imports that only accompanies an expansion of the population does not indicate an economy of growing complexity per se. Over the entire period, the volume of Finnish trade was substantially lower than Sweden’s trade. On average, per capita exports of Finland were 9% of Sweden’s per capita exports, while per capita imports were estimated at 16%. This, however, does not take into account that some of the foreign trade to- and from Finland may have passed Sweden. Neither is the trade between Sweden and Finland considered here since the two countries belonged to the same kingdom. The south-eastern parts of Finland were conquered by Russia already in the early eighteenth century, including the port of Vyborg, which Ojala and Räihä (2017, pp. 28, 35) note was a highly important northern
European focal point for timber exports. This means that Finnish trade is underestimated in the present study. However, still, we show that the weight of foreign trade in Finland increased relatively to Sweden, both absolutely and in per capita terms. In 1742, the source material registers no exports and imports to and from Finland, which is due to the occupation of Finland by Russia during the Swedish Hat government’s war with Russia.

Unlike Heckscher’s (1949b) conclusion that imports and exports were stagnant over the period from the late 1730s to the early nineteenth century, we establish that there was trade growth in this period (see Figure 3). Although the nominal values of this study are similar to Heckscher’s in a few instances, our main revision concerns the development of volume values. According to

![Figure 4. The development of exports, Sweden-Finland, 1738–1805.](image)

![Figure 5. The development of imports, Sweden-Finland, 1738–1805.](image)
Heckscher’s data (1949b, p. 48*)\textsuperscript{23}, total exports increased by 16% between the yearly averages 1738/40 and 1801/05. This is equivalent to a 24% decrease in per capita exports. By contrast, our data show that total exports increased by 80%, corresponding to an expansion of per capita exports by 17%. Furthermore, computations of Heckscher’s data (1949b, pp. 42*-43*) show that total imports to Sweden-Finland decreased by 31% between 1738/40 and 1801/05, which amounts to a 55% contraction of per capita imports. Our data, by comparison, demonstrate that total imports increased by 78%, equaling a 16% increase in per capita imports. The rate of growth of foreign trade is even more significant when studying Sweden and Finland separately. Finland increased its share of the population of Sweden-Finland, while per capita trade was at a lower level than in Sweden, which explains why the per capita growth of Sweden-Finland in total was lower than the per capita growth of Sweden and Finland, respectively. During the period under study, exports per capita increased by 27% in Sweden and 32% in Finland.

A shortcoming apparent in Heckscher’s analysis was that he did not construct series for all individual goods, as done in this study, or by Schön (1984) from 1800 and onward. Another drawback was that he first used the administratively fixed prices of the Swedish National Board of Trade, which largely did not change between 1738 and 1805. He then deflated the nominal values of exports and imports with a price index, expressed in riksdaler specie with a stable silver content, which increased more than twofold during the studied period. Although in per capita terms, globalisation proceeded slowly, mercantilism did not cause the outright decline that Heckscher had determined.

The development of the nominal ratios of exports- and imports to GDP, assuming that nominal GDP per capita in Finland was 90% of the level in Sweden, indicates that globalisation was stagnating, or possibly reversing.\textsuperscript{24} Figure 4 shows that for exports this ratio declined by 9% during the period of the yearly averages 1738/40 and 1801/05, while for imports in Figure 5 the ratio increased by 2%. An explanation for these lower nominal per capita values vis-à-vis the corresponding volume measures is the downward movement of the prices of exported and imported goods compared to the GDP deflator. Export prices declined by as much as 20% in relation to the GDP deflator, mainly explained by a drop in the relative price of iron, while import prices declined by 10%. As a result, the terms of trade, the ratio between export prices and import prices deteriorated.

5.2. Specialisation and its development

The database can provide important clues about individual goods, or groups of goods, in terms of their specialisation. Economic efficiency depends on the specialisation of enterprises and their workers in various interrelated activities, and the complexity of these interactions are correlated with national prosperity. Unlike exports, imports are usually more diversified, as countries tend to import a broad range of products. The most important exported goods were metal products, of which iron constituted the largest part. Iron was the predominant Swedish export already in the sixteenth century, and as Schön (2012, p. 52) holds, during the eighteenth century Swedish iron making gained a very strong position on the European market for wrought iron. On average, iron and steel accounted for 60% of total exports of Sweden-Finland 1738–1805. Bar iron alone stood at 53%. The other most important exports in order of importance were Baltic herring (8%), planks (8%), copper and brass (7%), tar (3%), and pitch (3%). On average, these six commodity types accounted for as much as 90% of the total export value, indicating a strong specialisation. Grains, salt, raw materials for textiles, sugar, and coffee beans, constituted the largest quantities shipped to Sweden-Finland in value terms.

The composition of Finnish trade was quite different from Sweden. In Finland, on average, planks constituted as much as 45% of total exports, reflecting its high dependence on forestry, while tar made up 20%, and iron 14%. This can be compared to Sweden’s exports of which the share of

\textsuperscript{23}The symbol * refers to the appendices of Heckscher (1949b).

\textsuperscript{24}The GDP data is from Edvinsson (2013, 2014).
iron and steel was 61%, and planks 7%. The three most important commodities imported to Finland were salt, corresponding to an average of 34%, grains at 18% and tobacco 12%. As for Sweden, on average, the import of grains was 23%, coffee 10%, salt 9% and sugar 9%. Despite the large share of salt of the Finnish imports, in per capita volume terms, salt imports were twice as high in Sweden than Finland.

Figures 6 and 7 illustrate the evolution of the HHI and the SEI for exports and imports divided into two levels of classification. As depicted, the degree of specialisation for exports was significantly

![Figure 6](image_url)

**Figure 6.** The development of the Hirschman-Herfindahl index for exports and imports in Sweden-Finland, based on two different levels of decomposition, 1738–1805.

![Figure 7](image_url)

**Figure 7.** The development of the Shannon Entropy index for exports and imports, Sweden-Finland, based on two different levels of decomposition, 1738–1805.
higher than the concentration of imports, reflecting the dominance of iron exports. As for exports, the HHI indicates that specialisation decreased over time, whichever classification is used. With regard to imports, no notable changes occurred in terms of concentration, while classified into 10 branches, although the classification into 69 types of goods indicated a somewhat higher concentration. From the SEI a similar conclusion can be drawn, i.e. exports became less specialised over time, while the concentration of imports did not see any marked changes.

The decrease in the level of specialisation of exports can almost entirely be explained by the decrease in the share of bar iron of the export portfolio, from a median of 63%, 1738–1770, to a median of 44%, 1771–1805, while the median share in exports of Baltic herring increased from 0.1% to 12%, over the two periods. The relative share of planks and tar also increased over time. The share of non-iron products reached a peak in 1788. Notwithstanding that, the per capita volume value of metal industries did not decline. The degree of specialisation developed somewhat differently in Sweden and Finland. Figure 8 displays the Hirschman-Herfindahl-Index for exports from Sweden and Finland, respectively, according to a classification into 90 types of goods, while Figure 11 displays the index for imports to Sweden and Finland, according to a classification into 69 types of goods. Figure 8 shows that the specialisation of exports was consistently higher for Sweden than Finland. Specialisation decreased over time for both countries.

Figure 9 shows that the concentration of Finnish imports was higher compared to Sweden, reflecting a lower level of imports per capita, and a higher share of basic types of commodities including salt.

In Figure 10, exports per inhabitant are exhibited for iron and steel, copper and brass, Baltic herring, and planks. As illustrated, for both iron and copper, the level of exports was quite stable over time. Copper exports fluctuated to a higher degree, and these exports per capita around 1800 were lower than during the 1740s. The large copper exports of the 1780s were to an extent a consequence of the dismantling of the copper standard, which made copper circulating in Sweden available for export. Baltic herring expanded in the 1760s and became the second most important export commodity. If we look at economic complexity, a drop in Swedish iron exports indicates decreased complexity and tends to be compatible with other indicators of economic stagnation during this period, such as the low rate of urbanisation. The knowledge, organisation, and labour skills involved with the ironworks were certainly more sophisticated than that of salted herring and forestry. A comparative glance can also be made with Britain. British textile exports were dominant during the industrial
Another sector that saw export growth was British iron, although iron exports were significantly lower than textiles. Britain was a leader in textile production both in terms of output and technological innovation (Evans, 2001, pp. 133, 500). Also, the country gradually developed more diversified iron production producing cast iron, compared to Sweden where bar iron was dominant (Hildebrand, 1958, pp. 8–9). Therefore, both in terms of complexity involved with production and the volume of foreign trade, Britain experienced rapid development compared to Sweden.
In Sweden, there were three main types of bar iron that were produced: Öregrundsjärn, Bruksstångjärn, and Bergmansjärn. Among those, Öregrundsjärn or Orground iron, manufactured at the Walloon foundries in the vicinity of Dannemora was the most premier product, followed by Bruksstångjärn. Because of its high quality, the iron ore from the Dannemora mine was the most suitable for the production of blister steel. Most probably the Walloon smithy also played an important role as it was thought of as resulting in a firmer and smoother type of iron than that of the traditional German smithy. However, in terms of quantity, the without doubt predominant type of bar iron which was exported was Bruksstångjärn and not Orground iron (Högberg, 1969, pp. 51–52).

Therefore, Heckscher’s (1949a, pp. 400–407) assertion that the demand for Swedish iron was not primarily because of its perceived quality appears to hold true. It was rather the case that the capacity of the Swedish foundries to produce bar iron was greater compared to other iron producing countries. According to Högberg (1969, p. 49), higher quantities of processed iron were exported during the 1770s and 1780s. Also, the 1780s saw an increase in the exports of bar iron, but the export of iron of the former type was more rapid. However, still, bar iron was the most important Swedish export commodity throughout the eighteenth century. During the 1780s, there was a marginal increase in the exports of bar iron, while iron which was further processed saw a larger increase. Also, our database shows that steel was exported in higher quantities during the 1770s and 1780s.

British statistics on imports of Swedish iron show that these imports decreased in this period, while Russian iron imports had seen an increase from the 1740s onward (Hildebrand, 1958, p. 10). By 1765 Britain imported higher quantities of iron from Russia compared to Sweden (Roberts, 2003, p. 82), thus ending the monopoly Swedish producers had enjoyed on the international market for iron (Högberg, 1969, pp. 76, 78, 82).

The composition of imports was quite stable over the longer time period, although there were sharp annual fluctuations. Both Sweden and Finland were net importers of grains during the whole period under investigation. The countries also exported grain notwithstanding, the amount was negligible. Per capita imports of grain to Sweden were higher than those of Finland for all years. However, it is possible that some of the grain imports to Sweden were re-exported to Finland.

As seen in Figure 11, importation of sugar and coffee expanded. However, based on the lack of variation of imports, by and large, consumption patterns did not markedly change, suggesting that no consumer revolution occurred during the period of study. Imports of coffee beans were negligible prior to 1760 and then experienced a dramatic increase, starting during the 1770s. This indicates that consumption of coffee became much more widespread, which was the only clear indicator of a substantive change in consumption patterns. Imports of tobacco declined in per capita terms, probably because of the expansion of domestic production.

Figure 11. Imports of coffee beans, sugar and tobacco, Sweden-Finland (grams per capita), 1738–1805.
6. Concluding remarks

This paper presented a new database on foreign trade of Sweden-Finland, for the period 1738–1805. From 1800 onward, data on total foreign trade has been estimated by Schön (1984), while annual series at the aggregate level for the pre-1800 period, encompassing all goods have previously not existed. Previously, valuation of total exports and imports for the eighteenth century has shown to be problematic due to the application of different deflation techniques over time, or the exclusion of some of the goods.

By the nineteenth century Sweden belonged to the poorest countries in western Europe, despite its sophisticated institutions and human capital. Sweden’s relative international economic position weakened during the eighteenth century until the first half of the nineteenth century. Nevertheless, both Swedish and Finnish exports in the eighteenth century were highly specialised. In contrast to Heckscher, we cannot conclude that globalisation in Sweden-Finland was in decline. The volume of per capita exports in the early nineteenth century was slightly higher than in the 1730s, while total exports and imports increased substantially accompanying population growth. In Finland, foreign trade advanced more, but from a much lower level than in Sweden. The small advance partly took place because exports became more diversified while specialisation declined. The share of metal exports decreased somewhat in Sweden, while products requiring less sophisticated technology, most importantly Baltic herring increased in importance.

Sweden-Finland suffered a downward movement in real export prices in the early nineteenth century, entailing that the ratio of exports to GDP declined to a certain degree. Lower export earnings may have induced the transformation of agriculture towards self-sufficiency. While exports of iron and copper enabled the Swedish kingdom to become a great power in the seventeenth century, its dependence on exporting raw materials entailed that the Swedish economy initially lost when the industrial revolution gained force in western Europe. During the period of our study, both Swedish and Finnish specialisation declined, despite the industrial revolution that occurred in England at the time. The positive impacts of industrialisation and globalisation in Sweden were not keenly felt until the nineteenth century, although the first wave of international integration in the 1850s and 1860s occurred by exporting products that required less sophistication.

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